# MIT Faculty Newsletter

in this issue we offer our Teach Talk feature, "Skills, Big Ideas, and Getting Grades Out of the Way," by Patrick Henry Winston (page 6); a report on potential national standardized testing for universities by Jonathan King (page 10); and a follow-up to last issue's fundraising announcement, "Is the Campaign for Students Shortchanging Graduate Students?" by Gareth H. McKinley (page 12).
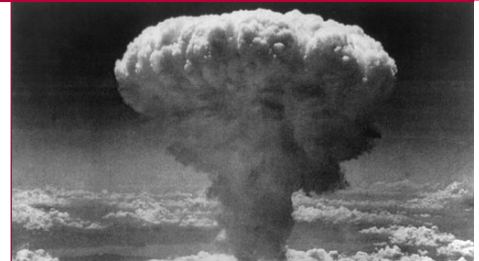
Nuclear Disarmament Activities at MIT: Rising from the Ashes

Aron Bernstein, Heather Lechtman, Kosta Tsipis

ALMOST EXACTLY 25 YEARS AGO, in a speech launching his "Star Wars" initiative, President Reagan said: "I call on the scientific community in our country, those who gave us nuclear weapons, to turn their great talents now to the cause of mankind and world peace, to give us the means of rendering these nuclear weapons impotent and obsolete."

Reagan either did not know, or did not believe, the Los Alamos scientists who had developed nuclear weapons and who warned in 1945 that effective countermeasures were unlikely to be developed. They had argued that safety from nuclear weapons was possible "only by suitable international arrangements." This was not the first time that a politician had issued a clarion call for impossible technical solutions to a political problem. Following the development of nuclear weapons, scientists have been trying unsuccessfully to warn the public and the politicians that abolition of nuclear weapons is the only sure way to prevent their use.

With the collapse of the Soviet Union in December 1991, many of us thought that the nuclear arms race would end and the reduction of the weapons inventory would begin in earnest. Instead we have witnessed only a very slow reduction in their numbers from the staggering worldwide maximum of about

Editorial
Difficult Times Ahead Require a Higher Level of Faculty Participation in Setting Policies

THE RECENT REPORT ON DECLINING biomedical R&D investment, "A Broken Pipeline?" (*brokenpipeline.org/broken pipeline.pdf*) carried poignant profiles of young scientists whose biomedical research programs are blocked by the decline in NIH research funding. Their situations reflect the plight of junior faculty and postdoctoral fellows in all disciplines at MIT and across the country. The consequences of failure to invest in our young scientists is not limited to personal tragedies; it undermines the overall economy, the ability to alleviate the suffering of disease and mitigate degradation of the environment, and our long-term efforts to raise the standard of living.

The restrictions on the growth of the NIH, NSF, NASA, DOE, NOAA, and EPA R&D budgets do not appear to reflect a conscious Congressional policy to disinvest in science and technology. Rather, they reflect the constraint of the enormous federal expenditures to prosecute the war on Iraq, the significant decrease in income tax revenue due to the Bush tax cuts for the wealthiest Americans, and now the multiple impacts of the recession on the federal budget. This economic reality will take some years and major policy changes to correct.

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Photo credit: *Page 8,* Courtesy MIT Museum

Difficult Times Ahead

In the meantime we will have many difficult choices to make. Research universities like MIT will be hit particularly hard by the federal R&D downturn. The impact will be felt not just by junior faculty, but all faculty carrying out federally-funded research, together with the postdoctoral fellows and graduate students supported by these programs. We expect that the MIT administration will respond vigorously to this challenge. However, dealing with the multiple campus impacts will also require the full wisdom and full participation of the faculty.

MIT is one of the only major research universities in the U.S. that lacks a faculty senate or council, with elected representatives both responsible and accountable for university-wide decision-making. The only institutions in the U.S. that still have governing bodies whose decisions depend on who shows up at the meeting, are the remaining towns with "Town Meetings." In fact, as with even small cities, MIT is too large and complex for that mode of governance. Compared to past periods of economic downturn, we also currently have many more members of the administration who come from outside MIT and sometimes from outside academia, so the indigenous knowledge of the faculty becomes even more valuable.

Our key Institute committees have hard working members and generally do an excellent job (see, for example, Prof. Widnall's article on the Committee on Discipline in this issue [page 15]). The problem arises at the next stage in the process, where committee reports, recommendations, or deliberations are brought to the broader faculty. With faculty meetings poorly and randomly attended – since no faculty are actually responsible for attending any given meeting – the critical broader input, debate, and deliberation are often inadequate. Some recent articles and exchanges in the *Newsletter* indicate that current mechanisms for efficient and inclusive faculty policy formation and input into overall MIT policy are not functioning well.

To be sure, we have witnessed some recent examples of effective faculty partici-

pation in policy formation, most notably the discussions and debate over curriculum revisions. However, these discussions had little direct economic impact on students or faculty. The answer is not to get rid of faculty meetings, but to make them into serious deliberative and decision-making bodies that are transparent and accountable. Our proposal in this editorial is to move toward a "Faculty Senate" with representa-

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tives elected by the faculty and with the following attributes:

1. For the decisions we face, MIT faculty now need representative governance, with faculty meetings attended by faculty representatives elected or selected, possibly by department or unit. During a two- or three-year term appointment, Faculty Senate representatives would be responsible and accountable for oversight of policy decisions made by the administration and the faculty.

2. One reasonable path to a definition of Faculty Senate responsibilities and authority that would balance legitimate faculty and administration interests, is for the newly-elected Senate leaders to directly negotiate them with the President and Provost. The objective here is not to override or displace policies and actions set by the administration, but to arrive at a clear and explicit articulation of faculty views and interests and to assure that they are taken seriously when the administration proposes actions that intersect with these interests.

3. Faculty meetings should be chaired by the Chair of the Faculty, so that when faculty views and concerns differ from administration views and concerns, both the faculty and the administration's representatives have ample opportunity to develop and present their case without being summarily overruled. This encourages communication and consensus as opposed to confrontation, which is surely a net gain for all Institute personnel.

4. Officers of the Faculty should be openly nominated and elected by the faculty, in a process that allows candidates with differing views and priorities to run for the office on a public platform.

5. The joint administration/faculty policy committee currently acts as a gate-keeper who decides which issues reach the faculty agenda. This committee should instead be given responsibility for implementing decisions made at the faculty meeting. The Faculty Senate, in consultation with representatives of the administration, should be solely responsible for structuring faculty-meeting agendas. The Chair of the Faculty Senate would be given authority for control of the flow of discussion at faculty meetings.

6. The Faculty Chair needs and should be assigned a budget and staff, as proposed by former chair Rafael Bras (see "Preliminary Position of the Faculty Policy Committee on Faculty Governance," *MIT Faculty Newsletter*, September/October 2004).

Here are three examples of policy decisions that need more adequate faculty input: a) As noted in the letter from Prof. McKinley (see page 12), the new $500M Campaign for Students allocates $400M for undergraduates, and $100M for graduate students. We are not aware of any serious input to this important initiative from the faculty at large or at a faculty meeting prior to the announcement of it by the administration; b) Many faculty members feel that the fashion in which MIT's total budget is allocated among administrative, instructional, and research functions will need much closer analysis in the future; c) The issue of return to the faculty from internal Institute resources (endowment, tuition) of some fraction of the overhead brought into MIT by faculty, needs serious consideration.

While decisions made with Faculty Senate input might not be or would have been necessarily different, the lack of faculty consultation is worrisome and becomes even more so as the budgetary pressures that we alluded to earlier become stronger.

In keeping with these views, the *Faculty Newsletter* itself is moving toward an Editorial Board that is elected by vote of the faculty (see page 7).

Editorial Sub-Committee

From The Faculty Chair
The World at 02139

Bish Sanyal

WHICH PRINCIPLES AND STRATEGIES should guide MIT's increasing international engagements? This is not a new question: As far back as 1975, an ad hoc advisory committee was created to discuss MIT's international institutional commitments. Later, in 1991, the Skolnikoff Report probed this question further. In 1996, an international council was formed to craft policy guidelines; and in 2005, the Faculty Policy Committee, under the leadership of then-Faculty Chair Rafael Bras, wrote a memo deliberating the same question. At present, a task force is being co-chaired by Associate Provost Philip Khoury and Vice President for Research Claude Canizares to probe once again that same question, but this time in a world very different from the one in 1975.

In most discussions of MIT's international engagements the issue is posed as an either/or proposition: Should MIT expand its operations abroad and thereby risk diluting what it offers domestically, or should we restrict our international engagements as a means to protect our domestic educational turf. In this dichotomous conceptualization of the issue, 02139 is viewed as the domestic setting for a top-ranking American research university which must now consider the extent to which it should internationalize its operations.

Even though the international component of the MIT community at 02139 is quite large, with varied technical expertise, and comprises highly intelligent and culturally sophisticated individuals, the Institute has not given even half as much thought to this readily accessible resource as it has to international engagements in places such as Singapore, Cambridge, Abu Dhabi, Portugal, and Dubai. At MIT,

nearly 30 percent of the students, and an even higher proportion of the faculty, are international in origin. But the proportion of international students at the undergraduate level has remained constant at eight percent for some time, even though the academic records of international applicants are, on average, better than those of domestic students. As for the graduate international students at MIT, most serve as either a research or teaching assistant, and usually work very hard contributing to the remarkable productivity of MIT faculty.

MIT also hosts large numbers of postdoctoral and visiting fellows, such as the Knight Fellows in science journalism, or the SPURS/Humphrey mid-career fellows in urban and regional planning. Added to that are the international visiting faculty who are usually among the very best scientists and scholars in their own countries. Yet there is very little collective effort on MIT's part to celebrate this incredible influx of global knowledge and experience. I cannot think of even one committee, let alone a task force, which was created to recommend how to better utilize this resource.

MIT may be somewhat unique among the top-ranking U.S. universities in the way it has dealt with its international community. As an institute primarily devoted to science and engineering – two fields that rely on universal principles – there is an openness to the world at MIT which is wonderful. Yet, perhaps because of the attitude that scientific knowledge can be produced and verified anywhere, there is no special effort made to celebrate cultural variations in the way that knowledge is produced and disseminated. At MIT there is no international house such as that at the

University of Chicago, for example, where large numbers of students can gather to hear lectures, enjoy international meals and cultural shows, or discuss international political developments. True, we do have a Center for International Studies (CIS) with a strong focus on security studies. CIS's current director, Richard Samuels, was instrumental in starting the first MISTI (MIT International Science and Technology Initiatives) program in Japan, and under his leadership CIS has expanded its activities considerably. But, the center is located in two floors of a non-descript building which is more known for housing the MIT Press bookstore in its ground floor than as a venue for regularly held international events for students and faculty from all five Schools. The newly formed iHouse (2007) is a very small effort to bridge living and learning about international developments when compared to similar efforts at our peer institutions. The Public Service Center (PSC) at MIT tries to cultivate some form of cooperation among domestic and international students and fellows by sponsoring competitions, such as MIT's 100K Entrepreneurship Competition, but PSC is under-funded and lacks strong administrative infrastructure necessary to support a range of activities.

More Examples
At MIT there is no guesthouse for international visitors or short-term fellows who usually face difficulties finding accommodations in a city that is known for relatively high rents and a shortage of good rental housing close to the MIT campus. This is particularly embarrassing for MIT faculty, because we are treated so well when we visit universities abroad. Our International Students Office does help

arrange for visas, and the Department of Foreign Languages and Literatures does provide a few special courses on English speaking and writing. There are also a few country-based student clubs, some of which promote cultural awareness through lectures, etc., or may even award a prestigious science prize as does the Arab Student Organization. But by and large the purpose of these clubs is to provide occasional emotional sanctuary to international students and fellows, not to connect them deeply to domestic students. Thus we miss the opportunity to build deeper linkages between MIT's domestic and international students and fellows who, if nurtured well, could serve as mentors to our undergraduate students who decide to travel abroad.

A Different Course of Action
So how do we generate a new enthusiasm at MIT for globally inspired learning? The broad objective should be to create a setting – physical, social, and intellectual – for both domestic and international students, faculty and fellows, to engage in conversations, discussions, and ultimately, joint problem-solving exercises; and an idea came to mind while discussing with Amy Smith of Mechanical Engineering how to increase enrollment in the popular D-Lab course which we co-teach. We imagined a building whose entrance lobby could be surrounded by lab space that would showcase the various inventions by MIT students and faculty designed to improve the quality of life of poor households worldwide. The same building could also be the new home for CIS, with seminar rooms and conference facilities for long-distance video conferencing. The building could host the various MISTI programs, and perhaps also provide a few classrooms for teaching international languages. As Wes Harris always reminds me: if MIT really wants to internationalize education, we must require that all students and faculty are fluent in at least two languages. A beautiful setting for learning new languages could be a good incentive for the students and faculty who are often confined in their labs.

On the upper floors of the building, there could be living quarters for international visitors and speakers who come to MIT for a short time, like the week-long visitors who help guide various experiments for D-Lab students. Similarly, some visiting fellows of the Center for International Studies could be provided accommodations in the residential quarter of the building. We could require that all visiting fellows and guests con-

Why not create a fund for strengthening internationalization efforts at 02139 . . .

tribute to the hosting of international events to be held in the building, in exchange for subsidized rates on room and board. An unpretentious but good restaurant offering international cuisine also could be housed, providing space for holding large international cultural events – including food and beverages. There is no end to the possibilities of how such a building could be designed to express MIT's serious engagement with the world. In fact, an innovatively designed building could serve as a symbol of what internationalization means at MIT now.

But celebration of the world at 02139 requires first and foremost a very different mindset than the one which is marked by the current frenzy among many American Universities to go global in pursuit of non-traditional revenues. True, all universities could benefit from additional revenue, but to justify such policies in the name of internationalization of education when opportunities for internationalization at home remain unexplored and unappreciated, seems almost like putting the cart before the horse. Whereas there is no substitute for our students traveling abroad and immersing themselves in different cultures, for such travels to be truly meaningful and productive much preparation at home is needed: new courses have to be offered; new types of research need to be funded; and institutional contacts have to be formalized so our students have institutional homes while living abroad. Most importantly, MIT students

need to be encouraged to engage in joint problem-solving with students and faculty from elsewhere, allowing them to appreciate that problems can be defined and solved in more than one way.

To prepare our students so they can appreciate diverse modes of learning and jointly solve problems that are cross-national in origin, MIT needs to invest not just in a new building, but also in new courses, research activities, and social and cultural events. So where would the funds come from? As opposed to standard answers like raising endowments from alumni and friends of MIT who want to internationalize MIT's education, there is another way which may ultimately address the dilemma of whether to go global or stay firm at 02139. Why not create a fund for strengthening internationalization efforts at 02139 – a fund to which all our international collaborators from around the world would have to contribute if they want to utilize MIT's faculty and its brand name to strengthen their own competitive advantage in the market for educational services? This surcharge could be added to other costs MIT usually charges collaborators in other nations; and the new pool of funds could be used as a challenge fund to generate more resources from domestic as well as international alumni.

If this sounds like a fantasy, or too big an idea, let us remind ourselves that compared to the boldness of the proposals from foreign governments which have captivated America's top research universities to engage in a gold rush abroad, what I am proposing is not outrageously expensive. It is one way to create a hub of international research, teaching, and cultural exchange activities at 02139 that will not be available for sale to even the highest bidder. ■

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Teach Talk
Skills, Big Ideas, and Getting Grades Out of the Way

Patrick Henry Winston

"WHAT WAS CLASS AVERAGE?" I feel like I have been asked a 1,000 times, and I confess, each time it makes me cringe. It tells me the student is fixated on evaluation, not on the material. It tells me the student is competing with other students, rather than aspiring for a level of knowledge. It tells me the student thinks we grade on a curve, which is prohibited by a sensible MIT rule. And worst of all, it tells me the student is focusing on testable skills that can be taught anywhere, not on absorbing the big ideas that can only be taught at a place that develops big ideas.

In the fall of 2006, just after yet another student in 6.034, Introduction to Artificial Intelligence, asked the class-average question, we of the staff decided that we had had enough, and that it was time to start over in a search for a better way of certifying skills. Our first step was to enumerate some principles:

- We should find a way to deemphasize grades so as to make room for big ideas.
- We should test understanding, not speed and general intelligence.
- We should not care whether a student demonstrates understanding early in the semester, or late, as long as the student demonstrates understanding.
- We should give an A to every student that demonstrates A-level understanding.

Guided by our desire to test subject understanding and deemphasize quiz-taking speed, we decided to move from two material-packed quizzes to four more relaxed quizzes. Further guided by our desire to test subject understanding rather than general intelligence, we decided to

resist the temptation to be so clever that our quizzes test the students on how well they can penetrate our cleverness, rather than their understanding of the material.

To acknowledge that we do not care when a student demonstrates subject understanding, as long as the student demonstrates understanding, we decided to divide our final examination into parts corresponding to the four quizzes, plus a fifth part covering material taught after the latest quiz date that Institute rules allow. Then, we award the student the higher of the grades they get on the quizzes and the corresponding parts of the final.

This maximizing created a minor problem because a good numerical score on a particular quiz might be substantially higher or lower than a good grade on the corresponding part of the final, so we had to devise a way to decide which score was better and a way to combine that better score into a final-grade formula. We could have just normalized the means and standard deviations, but that distribution-oriented approach seemed inconsistent with our antibodies against the "What was class average?" question. Accordingly, we decided to transform each 0 – 100 numerical quiz score into an integer from 3 to 5. For each quiz, we decided on a threshold for *thorough understanding*, and each student who scores above that threshold comes away with a 5. Each student who

scores lower than that but above our *adequate understanding* threshold, earns a 4. Lower than that but above our *needs work* threshold gets a 3. Lower than that, we award only 0, 1, or 2, depending on how much lower.

> Better yet, when a student asks the class-average question, we are able to say, with pride, "We have no idea." They soon quit asking.

This thresholding scheme has two virtues. First, we solve the problem of deciding whether the quiz score is higher or lower than the corresponding part of the final. Second, there is far less grade grubbing because there is no point in arguing about a few points when a student's grade is more than a few points shy of the next threshold.

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To diminish grade grubbing when grades fall near thresholds, we added to our grade-recording spreadsheet a smoothed staircase function that transitions rapidly near the thresholds, rather than with a singularity. The function was borrowed from neural-net learning theory:

$$G = \frac{3}{1 - e^{c \times (s - t_1)}} + \frac{1}{1 - e^{c \times (s - t_2)}} + \frac{1}{1 - e^{c \times (s - t_3)}}$$

where the G is the transformed grade; s is the raw score; the ts are the thresholds; and c is a constant that determines the degree of smoothing. We found c = 0.7 to be about right, producing the graph shown for thresholds at 50, 70, and 90:
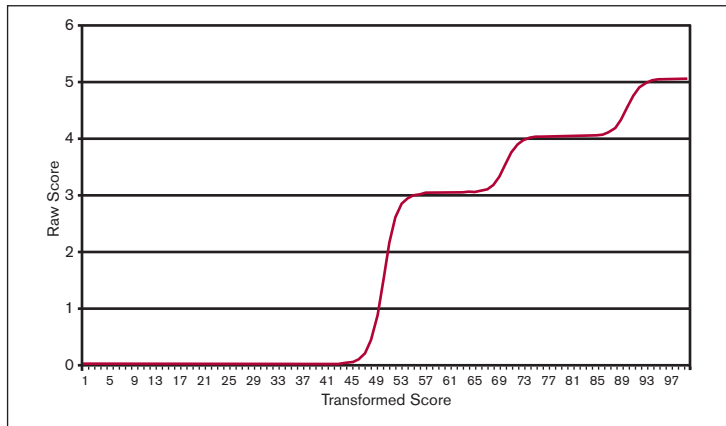
At the end of the subject, we are left with six numbers from 0 to 5: four are the results of maximizing quiz scores and final scores; one comes from the fifth part of the final; the sixth comes from homework and a subjective assessment of class participation. If the average is 4.5 or better, the student gets an A; 3.5 – 4.5, a B; 2.5 – 3.5, a C; and every student below 2.5 is the subject of a full discussion. Thus, there is a kind of 6.034 GPA that determines each student's final grade.

The students love our grading procedure because they get two shots at each chunk of material. Also, they know that if they are content with a quiz score, they need not do the corresponding part of the final at all, so they can focus their prepara- tion for the final on precisely the subject matter that needs the most work.

When we first tried our new grading procedure in the fall of 2006, we expected many students to leave by the end of the first hour or two of our three- hour final, because there were a substan- tial number who were in the highest category for all or all but one of the four quizzes. As time went by, we noted, with some alarm, that many known-to-be- excellent students stayed the entire three hours. When the exam was over, we asked one of the highest-category stu- dents why she did all five parts when we had made it clear she needed to do only one. "Oh," she said, "I did the rest for fun!" Our pride was palpable. We knew we were on to something. ■

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Newsletter Elections to be Held this Spring

FOLLOWING PROCEDURES outlined in the *Policies and Procedures of the MIT Faculty Newsletter*, an Institute-wide election for two new members of the FNL Editorial Board will be held in the coming weeks. All regular faculty members and professors emeriti will be eligible to vote.

Nominees for the Editorial Board were selected from a list submitted by faculty, after being screened by the *Newsletter* Nominations Committee (Alice Amsden, John Belcher, Fred Moavenzadeh, and Ron Prinn) and approved at the February *Newsletter* Editorial Board Meeting.

Elections will be electronically based, with each eligible voter receiving an e-mail with a link to the voting site. Faculty and faculty emeriti will need to have MIT Web certificates installed on their computer, to allow for voter authen- tication. No record of individual voting preferences will be kept.

According the the FNL *Policies and Procedures:*

• "The Nominations Committee will have the responsibility of recruiting and eval- uating candidates for the Editorial Board, taking into account the need for representation from different schools and sectors of the Institute, junior, senior, and retired faculty, male and female, underrepresented groups or faculty constituencies."

• "Candidates for the Editorial Board should give evidence of commitment to the integrity and independence of the faculty, and to the role of the *Faculty Newsletter* as an important voice of the faculty."

To our knowledge, this will be the first Institute-wide election of any kind in MIT history. We encourage the participation of everyone eligible to vote. ■

Nuclear Disarmament Activities
Bernstein et al., from page 1

65,000 weapons in 1986 to approximately 20,000 today. Adding to the danger of this appallingly large number is the fact that many of these weapons are on hair trigger alert, capable of being fired in very short times and, therefore, without serious thought or oversight. Despite this danger, the issue of nuclear weapons largely disappeared from public discussion following the collapse of the Soviet Union. Attention has shifted towards the issues of anthropogenic climate change and how to handle energy production and needs.

Launching an MIT Nuclear Abolition Initiative

We believe a revival of interest in nuclear arms control is urgent – globally, nationally, and at MIT. Concerned by recent events, a group of faculty and students has formed "The MIT Nuclear Abolition Initiative" with the intention of holding public events to involve more students and faculty, as well as staff members. We plan the first such event early in May, with a discussion and a showing of the film *Dr. Strangelove*. Future events are being planned for the fall, and we may offer an undergraduate seminar on nuclear weapons. As members of this initiative we have been asked to present our thoughts for the *Faculty Newsletter*.

We believe that MIT, by virtue of its preeminence in science and engineering, should continue to play a major role in the solution to the nuclear arms race. We invite MIT faculty, students, and staff to join us in the discussion of the goal of abolishing these weapons. We believe that the tradition of serving society and safeguarding the Earth is as alive and strong today at MIT as it was in the years following the Manhattan Project. More than 60 years after the development of atomic weapons and a quarter of a century after President Reagan's request that those who developed those weapons should control them, we are indeed attempting to do that – not with

March 4, 1969. MIT Provost Jerome B. Wiesner (with pipe) marches with students.

missile defense technology but by continuing to convince all reasonable inhabitants of our fragile planet to abolish the genie that our forefathers let out of the bottle.

What has happened to bring arms control back into focus? One recent cause was 9/11, an event that raised the specter of nuclear terrorism and the realization that even a limited use of nuclear weapons would wreak significant destruction. The issue of proliferation has also resurged as a hot topic. Indeed, these two issues are connected, particularly since the Kahn network, operating from Pakistan, was active in supplying nuclear weapons knowledge in several sensitive places. There is a growing realization that our nuclear weapons posture is counterproductive, working against rather than for a global non-proliferation regime. Such "nuclear eminences" as Henry Kissinger and George Schultze have helped to break the long-term silence on this issue with a call for nuclear abolition as a serious long-term goal.

MIT's Role in Nuclear Disarmament Efforts

The post-WW II MIT faculty was rich in Los Alamos alums, including (among many others) Bernard Feld, Phillip Morrison, Cyril Stanley Smith, and Victor Weisskopf. These men had played major roles in the Manhattan Project and went on in the post-war period to urge the U.S. to give up its nuclear weapons. When that did not happen, they urged international control. Initial focus was on testifying before Congress and educating policy makers and the public on the unprecedented danger posed by nuclear weapons and the necessity to control them. Morrison helped start the Federation of American Scientists (FAS), the political arm of the scientists' movement, espousing the twin goals of abolishing nuclear weapons and establishing civilian control of nuclear energy. Feld was an early editor of the *Bulletin of the Atomic Scientists*, the public outreach arm of the scientists' movement.

Gradually it became clear that the control of nuclear weapons could not be affected by a short campaign, but required a long-term commitment. The initial

The Manhattan Project alumni were joined by colleagues from many disciplines . . . who participated in the excitement of the time.

efforts at international control failed, and the emphasis of the arms control community shifted. Some of the scientists took the "insider track" of trying to tone down the arms race by giving expert advice to policy makers. Some scientists used their international connections to establish dialogue between Russian and Western scientists and policy makers via the Pugwash conferences. Feld played a major role in these, as did Kosta Tsipis, George Rathjens, and Jack Ruina. Courses of study were established to expose students to these issues and to train professionals for the extended and increasingly technically demanding issues that arms control entailed. Rathjens and Ruina set up a program in MIT's Center for International Studies. In 1978, Feld and Tsipis started the "Program in Science and Technology for International Security", devoted to technical studies of military systems and practices. They taught courses, trained students and post-docs, and wrote numerous technical and non-technical articles. These MIT programs trained many students and mid-career professional scientists who later became prominent in arms control work and who, in turn, produced technical and general interest articles and books, influential op-eds, and advice to policy makers including congressional testimony.

A parallel effort was being made on the "outsiders track," trying to create public opposition to the arms race. One activity with long-term reverberations was the formation of the Union of Concerned Scientists (UCS) on March 4, 1969, following a teach-in at MIT. Limitations of space (and memory) preclude even a partial summary of those years of activity, but one outstanding event was the establishment in 1980 of the Nuclear Freeze Movement by MIT graduate student Randy Forsberg.

Many of our colleagues were involved in these activities, some in multiple roles. The Manhattan Project alumni were joined by colleagues from many disciplines including Henry Kendall, Scott Paradise, Francis Low, Leo Marx, Salvador Luria, George Rathjens, Jack Ruina, Kosta Tsipis, Jerome Wiesner and many, many others, who participated in the excitement of the time.

The Authors' Involvement

The three authors of this article have had long involvement with nuclear arms reduction and control, including extended personal contact with many of the Manhattan Project scientists. Tsipis was a founding member of an arms control center at MIT. In 1984, he, together with Feld, Morrison, Jonathan King, Eugene Bell, Jack Dennis, James Paradis, and others, wrote the "Nuclear Almanac," an exhaustive study of nuclear weapons and their planned uses. In 1993 Wiesner, Morrison and Tsipis wrote "Beyond the Looking Glass," a study of the U.S. military after 2000. In 1998, Morrison and Tsipis wrote "Reason Enough to Hope," a study of military forces and needs in the twenty-first century.

Heather Lechtman came to MIT by invitation of Manhattan Project alumnus Cyril Smith. She was a close colleague and friend of Alice Kimball Smith, whose 1965 book, *A Peril and A Hope: The Scientists Movement in America, 1945-1947*, was translated into Japanese immediately upon its publication. Lechtman was inspired by Feld, one of the youngest of the scientists at Los Alamos, who cautioned MIT students never to allow their investment in research to seduce them, as he had been seduced, to lose track of the goal of that research and of the inescapable, destructive impact it might have on human beings and ecosystems.

Aron Bernstein taught undergraduate seminars with Morrison on the nuclear arms race and has been active in both UCS and FAS. He chaired the MIT Disarmament Study Group in the 1980s and was faculty advisor to the associated student group. He is presently on the National Advisory Board of the Council for a Livable World, an organization founded by Leo Szilard in 1962 to elect candidates to the U.S. Senate who are strongly committed to reducing the nuclear arms race. (Tsipis has also served in this capacity.)

Invitation to Participate

With the risks of nuclear weapons use and proliferation increasing, and with public opinion galvanized by terrorist threats, it is time to begin anew. The world is more dangerous and complex as the bipolar U.S.-U.S.S.R. nuclear stand-off has been replaced with multiple existing and potential nuclear states – often in the most politically volatile regions – as well as with possible terrorist actors. In our view we urgently need to discuss the measures that will reduce the incentives for the acquisition of nuclear weapons, and realize the benefits of their abolition.

The long-range goal of nuclear weapons abolition, shorter term initiatives that could lead up to that, and the effects of both on nuclear proliferation and national security are complex problems which require a combination of technical and political solutions. MIT is well suited – perhaps uniquely so – to be active in this debate. The authors invite suggestions for future activities and participation in our group from all sectors of the campus. Please contact us. We welcome your involvement. ■

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Spellings Commission on the Future of Higher Education Hints at National Standardized Testing for Universities

Jonathan King

AS PRESIDENT BUSH APPROACHED his final year in office, his Secretary of Education released the administration's major policy document on higher education, a report from The Commission on the Future of Higher Education. The Commission was appointed by U.S. Secretary of Education Margaret Spellings, long time education advisor to President Bush. The Commission's August 2007 report contains a number of commendable recommendations: expand the fraction of our citizenry that participates in higher education; remove barriers to access, such as lack of academic preparation, financial means, or understanding how to navigate the process; and increase emphasis on science and engineering education. But perhaps of most concern, is the introduction of the notion of extending the central thrust of Bush K-12 education policy – standardized testing – to higher education.

The report addresses the major barrier to access – affordability – mostly by advising that applications for federal financial aid be streamlined and simplified. The only recommendation for a boost in direct financial aid – which would help more students actually afford to attend a four-year college – is limited to increasing the target of Pell grants over five years to 70% of the average State tuition at public four-year institutions. While this would be a valuable step forward, it is still woefully inadequate, for example, for research universities and private four-year colleges.

The report gives more emphasis to cutting costs than increasing investment. This business model is not surprising given the composition of the Spellings Commission, which was laden with corporate officers. Also participating were four university presidents, including MIT's former president Chuck Vest and James Duderstadt of the University of Michigan. Only three of the 18 members were active faculty, and none were active scientists.

Committee Chair Pushes Standardized Tests for Universities

A new element in the report was the call for increased "accountability" for institutions of higher education. In the Bush/Paige/Spellings Department of Education, this term has generally translated into assessment through standardized testing. The report clearly calls for implementing forms of standardized assessment so as to be able to compare "performance" of diverse higher institutions. A recent *New York Times* article (February 9, 2008) quotes Charles Miller, the investor who chairs the Commission: "What is clearly lacking is a nationwide system for comparative performance purposes, using standard formats."

As faculty with children in public school know, a major change in the K-12 school environment has been brought about by the implementation under the Bush administration of the federal No Child Left Behind (NLCB) Act, the catchy misnomer given to the reauthorization of the Elementary and Secondary Education Act. The damaging effect of the use of a single standardized test as the sole measure of student progress has been documented in a series of recent books and reports. These include: *Collateral Damage: How High-Stakes Testing Corrupts America's Schools*, by Sharon L. Nichols and David Berliner (2007); *Many Children Left Behind*, edited by Deborah Meier and George H. Wood (2004); and *When School Reform Goes Wrong*, by Nel Noddings (2007).

Given the Bush administration's track record of ignoring what students and public schools actually need, it is perhaps not surprising that its policy of substituting mandatory commercial standardized testing for authentic assessment and quality education is now being extended to higher education.

Though the Spellings/Miller call to bring colleges and universities into an NCLB-style "accountability" system may sound laudable to some, it represents retrograde educational policy. Colleges and universities are responsible for producing individuals with a vast variety of skills and talents. Engineers, architects, electricians, physicians, and lawyers are familiar with licensing and certification tests which control access to their professions. The mission of these tests is to set a floor of competence and ensure that practitioners meet some minimum standard of proficiency.

But colleges, and particularly research universities, play a different role in our society. We need their activities to expand knowledge, open new horizons, and raise ceilings in all areas of human technical, social, and economic activity. Requiring every biochemistry course in the U.S. to prepare students for a single national test in college biochemistry will narrow instruction, snuff out new initiatives, and alienate both students and teachers. The appropriate measure for college courses needs to be tuned to the local curriculum, and include lab reports, research papers, classroom exams, and other inquiry-based assessment tools. (For a concise critique of the impact of standardized testing on science education in Massachusetts see *www.ParentsCare.org/news/sciencemcas.htm.*)

Standardized tests move the control of curriculum and course content from the

faculty to the companies that produce and sell the tests. In higher education, the curriculum and content of courses needs to remain under the control of engaged professional faculty, though of course attentive to social, economic, and scientific developments.

Teacher, parent, civil rights, and youth advocacy organizations have uniformly rejected standardized high stakes tests as doing far more damage to schools than good. More than 140 national education, civil rights, religious, and labor organizations, representing millions of concerned citizens, have called for a major overhaul of the No Child Left Behind Act (***www.fairtest.org/joint-organizational-statement-no-child-left-behin***). A number of State legislatures have moved to reject Title I funds in order to be able to ignore the NCLB regulations that are mandatory only if the State accepts federal education dollars (***www.fairtest.org***).

Texas Origins of Bush Education Policy

The Bush administration has relied heavily on the Texas school system for the formation of education policy. His first Secretary of Education was Ron Paige, former Superintendent of Schools in Houston. Margaret Spellings was Senior Advisor to Governor Bush for six years in Texas. Charles Miller was Chair of the Board of Regents of the University of Texas system. Texas was one of the first state systems to institute high stakes testing as the criteria for high school graduation (TAAS – Texas Assessment of Academic Skills).

Both court cases and recent studies indicate the TAAS system contributed to the disastrous school dropout rate in Texas, 38% overall (Linda McNeill, et. al, "Education Policy Analysis Archives," January 2008). In a large urban school district, 60% of African-American students, 75% of Latino students, and 80% of ESL students failed to graduate within five years. These students were excluded from the test score analysis, resulting in then-Governor Bush claiming great gains in high school education (dubbed

the "Texas Miracle"). As test scores became the only criteria for evaluating teachers and schools, they have distorted and corrupted many aspects of the school system, as described in detail in *Collateral Damage*. Misreporting of student data in Houston was one of the factors that led to the resignation of Secretary of Education Paige. In fact, Texas has one of the lowest percentages of college attendance in the country, and half of entering college and university students require remedial classes. Most of the evidence indicates that the emphasis on a single standardized test further undermined an already stretched public school system.

There is no evidence to date that the Bush education policy of replacing emphasis on teaching and learning with emphasis on testing increases the quality or quantity of high school graduates. Continuing these policies will decrease the level of education and skill of our future workforce.

Who is Behind the Push for Standardizing Testing as the Only Measure of Learning?

If parents, teachers, professional educators, and scholars reject high-stakes standardized tests as a valuable educational tool, who supports them? The major support for high-stakes testing comes from a well-organized wing of the corporate sector, including the U.S. Chamber of Commerce, the National Association of Manufacturers, and the Conference Board. In part, this represents the growth of the testing and test prep business as a profit center. Public education is the largest sector of the U.S. economy that has not been privatized and is a target for a sector of the business community. Production, publication, distribution, and scoring of State tests is now a multi-billion-dollar business. Companies such as Edison Schools, Leona Group, and National Heritage Academies operate for profit schools and actively promote privatization of K-12 education.

The globalization of the economy is also having an effect. As manufacturing

has moved abroad, followed by increasing high-tech work, the corporate need for highly trained workers within the U.S. is declining. As shown by the recent report from Lindsay Lowell and Harold Salzman (see *Business Week*, October 26, 2007), there is no shortage of highly-skilled workers in the U.S. Faculty sitting on hiring committees, or trying to place their own students, know that there are far more talented and trained individuals than there are positions. This has been a growing source of tension and anxiety among graduate students and postdoctoral fellows.

Although some business spokesmen call for more scientists, examination of the actual positions of the U.S. Chamber of Commerce and the National Association of Manufacturers reveals no push for major increases in investment for the training of scientists and engineers. Their major thrust with respect to skilled labor is to increase the number of annual H1B visas granted to foreign workers. The AFL-CIO Department of Professional Employees has noted that large increases in such visas act to lower wages for skilled labor and shrink the market for employment of U.S. citizens.

In his recent MacVicar lecture at MIT, Nobel laureate physicist Carl Weiman described the results of many years of explicit research on how college students learn – or fail to learn – physics and chemistry. Advances in education research, in cognitive psychology, and in brain science have now opened the way to better instruction in basic physics, chemistry, and math classes. We don't need national standardized tests to improve teaching and learning in American colleges and universities. We need to implement the advances that have been identified, sharply increase student aid so that millions of high school graduates are not prevented from going on to post-secondary school education, and we need to increase the fraction of the federal budget and of the GDP that is invested in education. ■

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Is the Campaign for Students Shortchanging Graduate Students?

Gareth H. McKinley

IT WAS GREAT TO READ some of the early details about the upcoming $500M Campaign for Students that were revealed by the Chancellor in the January/February *Faculty Newsletter*. Raising additional resources for attracting and retaining the very best students at MIT is an overarching need for all departments at the Institute. However, I am a little concerned about the initial proposed distribution of the $500M; which includes $200M for undergraduate scholarship support, $100M for graduate fellowships, $100M for curriculum development and international study programs, $100M for living/learning communities and campus facilities. Arguably the bulk, if not all, of the latter two categories are focused on undergraduate students, so that we are only aiming to use 20% of the $500M total to help support graduate students. If we are exceedingly generous and say that some of the $200M in the latter categories is actually intended for graduate students, and is distributed at the same 1:2 ratio as the fellowship totals, then we are still only aiming to use 1/3 of the total funds raised in this campaign for the needs of graduate students at MIT.

Graduate students make up 59% of the enrolled students at the Institute now and the ratio continues to increase slowly. We presently enroll almost exactly twice as many graduate students per year (1,980 in 2007) as we do undergraduates (1,002 in 2007). Yet in the presently stated fundraising goals, we are choosing to clearly deemphasize their needs and exactly reverse these ratios. When we further incorporate the fact that a much higher percentage of graduate students are from overseas – and

therefore explicitly excluded from many government grants/scholarships – the fiscal picture for graduate students becomes even worse. The impact of insufficient graduate fellowship support is felt in almost every department and by every faculty member across the Institute. Many of the top research universities we

compete with for the top applicants know this and in fact use it explicitly in their entreaties to visiting graduate students each spring. A number of these universities also are now offering multiyear fellowships to the very top students, especially those in under-represented categories. I would really like to see the Campaign for Students recognize and respond aggressively to some of these market factors. Why not target $200M for graduate students and $100M for undergraduates? As the text of the Chancellor's article noted, this is apparently viewed as a "similar support" level when comparing graduate/undergraduate totals, and is certainly far better skewed to our current student composition.

$100M is a lot of money, of course, but it is really insufficient to address the Institute's needs at the graduate level. Assuming, for simplicity, a 5% disbursement on the endowment plus a cost of

$50K for a nine-month fellowship and stipend, $100M generates $5M in income and only gives us ca. 100 new fellowships per year, i.e., the ability to help the top 5% of our admitted students in each admitted graduate class. This is a start, but nowhere near the bold stroke needed to really address the problem.

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I would like to propose that we think a little more "out of the box" about our endowment as we approach this Campaign for Students and the Institute's sesquicentennial in 2011. Firstly, it should be recognized that raising new endowment funds for graduate student fellowships is particularly challenging, and not as attractive to prospective donors as naming new buildings or endowing Professorships. The fact that we need to have a Campaign for Students at all is, in part, a direct reflection that fundraising targets were not reached in these categories during the last Institute capital campaign! What can be done to make giving to the upcoming Campaign more attractive? One thought is to set up a new separate financial pool specifically for the new endowed funds that are raised in this campaign, and which returns more endowment income than the present paltry 4.5 – 5% per year. The MIT

Endowment continues to generate much larger returns than 5% (e.g., 22.1% in 2007, and an annualized rate of return of 15.6% over the last 10 years; even including the disastrous 2000-2002 years!). Even if we pay out on newly endowed funds at, say, 10% per annum, the original capital raised in the Campaign for Students – plus the additional residual retained interest beyond the 10% annual payout – should compound sufficiently fast to match the Institute's tuition rate increases (which, although reined in to 4.2% annual growth, of course still continue to outstrip inflation and cost-of-living increases).

The argument is sometimes made that we can't be creative with the endowment income we get at present because it is distributed amongst 2000+ separate funds all with restrictions. Another thought might be for the Institute to offer to match unrestricted alumni/ae donations to this new pool (during the Campaign for Students only) on a dollar-for-dollar basis. This financial matching could be done using gifts from leading donors or using some of the extra interest beyond the usual 4.5 – 5% rate of income on the unrestricted fraction of the existing $10B in endowment funds. The new unified graduate fellowship pool generated by this process would then be unrestricted and flexible to adapt and respond to future needs.

Such "limited time" offers might very well make the Campaign for Students far more attractive to graduate alumni, who will see a chance to leverage their donations to a cause that directly affected them during their residence at MIT. It also would give MIT a chance to claim the moral "high ground" on the issue – never a bad thing with increased congressional interest in the size, management, and usage of the top university endowments. The counter-argument that is always made about "past returns not guaranteeing future performance" should not be a show-stopper here; unlike committing to a new building or a new program, the number of fellowships awarded each year for newly admitted students can be rapidly and readily adjusted annually based on market performance (of course, if the Endowment does not return at least 10% in a hypothetical future year, we will have bigger problems to worry about than reducing the number of new graduate student fellowships!).

If the final numbers then became, say, a $200M target for Graduate Fellowships and a 10% disbursement on funds per year, we would be able to offer 400 new graduate fellowships each year and reach 20% of our incoming class – which really would change the landscape for graduate admissions in many departments at the Institute. ■

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Budget of the U.S. Government (FY2008)
Discretionary Funding by Major Agency
(Net budget authority in billions of dollars)

Agency	2006 Actual	2007 Current	2008 Request
Defense	410.7	429.6	481.4
Health and Human Services	69.1	69.1	69.3
Education	56.5	56.0	56.0
Housing and Urban Development	34.1	34.7	35.2
Veterans Affairs	32.9	33.2	39.4
Homeland Security	30.7	32.0	34.3
State and Other International Programs	30.2	28.7	35.0
Energy	23.6	22.8	24.3
Justice	21.1	19.4	20.2
Agriculture	21.1	19.6	20.2
National Aeronautics and Space Administration	16.3	16.2	17.3
Transportation	14.6	10.7	12.1
Treasury	11.4	11.4	12.1
Labor	11.3	11.7	10.6
Interior	10.8	10.3	10.6
Environmental Protection Agency	7.6	7.5	7.2
Commerce	6.4	5.6	6.6
National Science Foundation	5.6	5.6	6.4
Corps of Engineers	5.3	4.7	4.9
Other Agencies	24.0	23.8	26.7
Total, Discretionary Spending	**843.4**	**852.8**	**929.8**

Source: U.S. Office of Management and Budget: **www.whitehouse.gov/omb/budget/fy2008/summarytables.html**

MIT Poetry

by Anne Marie Michel

Notre Dame

Here treasures rest as light
Melts the insular rain of Paris.
You care only for a dark oak frieze on the medieval wall.

There are bad people and things get done.

So far it has not been hard for you to accept:
Even at home, the trees can be ominous,
And what of the feral cry at the backyard gate?

I hold you up to better see soldiers wrench
The innocents away, swords lifted, while the selfish king
Cradles his head, sits still.

Light a candle for fifty francs; it will be your first intention.

Cardinal

Red augur in my trees, I've known you longer
Than your drabby brown and constant wife.
All fall, worn by waiting and the ill,
I stitched your likeness with two-stranded wool
While you offered her late seeds in your yearly nest,
Compact bowl of dichondra, ryegrass, down.

Now in the predawn you are telling
Of the ripened mulberries.

Still amazed you will respond,
I teach my daughter your call:
whoit whoit whoit

I would like her too to know of your
Fire-feathers, loam-ore, privet hedge kingdoms.

Anne Marie Michel has worked at MIT for 12 years and currently serves as Assistant Dean for Development in the School of Humanities, Arts, and Social Sciences. These poems are the first she has published.

Student Culture: PSETs

Sheila Widnall

The Chair of the Committee on Discipline offers insight on issues dealing with Problem Sets

PROBLEM SETS ARE THE backbone of our teaching in many subjects; for many, problem solving is the essence of the MIT education. Faculty usually make their expectations for academic integrity clear to students at the beginning of the term and reinforce those expectations throughout the semester. While many of us value collaboration between students on PSETs as an aid to the learning process, most of us require that the work turned in be the student's own.

Faculty vary as to the portion of course credit derived from PSETs. In some cases, the entire course is weighted towards exams so that PSETs are seen as a learning tool. In other courses, PSETs are a substantial portion of the final grade.

The Committee on Discipline (COD) has dealt with several cases this year involving PSETs that seem appropriate to bring to the attention of the faculty. The issues that emerge from these cases should cause many of us to recommit ourselves to the ground rules we set for academic integrity in our courses and the follow-up required to ensure commitment of faculty and TA staff to these values. Of course the few cases we deal with are at the extreme of student culture and behavior and do not represent the behavior of the majority of MIT students.

One theme in these cases is the copying of PSETs, primarily from last year's solutions, which are freely available to students from bibles or the various course Websites. Obvious violations occur when students turn in problems copied blatantly – word for word – from last year's solutions. This is particularity egregious in situations where the problem statement and the resulting answer have actually been changed. Often unaware of this, the student blindly copies and hands in last year's solution.

In some cases, the student may hand in a problem from last year's set that was not included in this year's PSET. There is often a sense of entitlement about this

The final straw for COD occurred when a student handed in a Xerox copy of last year's PSET as his work on an assignment and argued for full credit because it represented work that he would have done.

process in that the student feels he deserves more credit for doing work that wasn't required, handing in an extra problem. Or that this is a valid "time-management" technique.

Course TAs are often the first ones to pick up on this plagiarism and most appropriately refer it to the faculty in charge of the course. In some cases, however, there is a sense that some TAs may be sending a mixed message to students that this behavior is OK "but don't do it again."

The final straw for COD occurred when a student handed in a Xerox copy of last year's PSET as his work on an assignment and argued for full credit because it represented work that he would have done.

The COD urges faculty to make their academic expectations clear, to have a consistent culture across faculty and TA staff, and to refer cases to the COD when violations occur. The Institute's academic integrity policy leaves the response to an act of academic dishonesty to the sole discretion of an individual faculty member. A faculty member can fail a student for the assignment, lower their grade, or fail them completely. In addition, there are two options for the faculty member to more formally document the act of academic dishonesty. The simplest option is to place a letter in the student's file with the Office of Student Mediation and Community Standards (OSMCS). If you feel that the incident needs to be taken further you are encouraged to file a complaint through OSMCS to be heard by the COD. If you are unsure about how you would like to handle a particular situation you can contact me or Dave Kennedy, director of OSMCS and staff to the COD, to talk through your options. ■

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Intentions and Outcomes: My Understanding of the Fall '07 Faculty Meetings

Bish Sanyal

The Faculty Chair responds to last issue's "Finding Polaris and Changing Course," by Professor Ken Manning

IF THE GOAL OF THE Winston-Manning resolution which was introduced at the faculty meeting on October 17, 2007, was to express the faculty's concern regarding the way the administration had reacted to the Star Simpson case, that purpose was served when the resolution was tabled that afternoon after some discussion. In fact, Winston himself had asked to table the resolution because he thought the purpose had been served by the discussion that afternoon.

At the faculty meeting on October 17, 2007, I had proposed that Winston and Manning might want to have a discussion, first, with the Faculty Policy Committee (FPC) before introducing a resolution at the full faculty meeting. My intention was to let the FPC members hear all sides of the issue, provide Winston and Manning a forum to air their views, and have a thorough discussion without the kind of adverse publicity a resolution against the administration was likely to generate. My intention was not to squelch deliberation but channel the faculty's energy towards learning and to raise the consciousness of the administration, not to publicly humiliate them.

The discussion at the faculty meeting on October 17, 2007, was moving at times because of the passion with which Winston, Manning, and other faculty members had expressed their concerns. By the time the motion was tabled at Winston's urging, however, the point had been made. Still, at the end of that faculty meeting, I personally requested both Winston and Manning to attend the next FPC meeting, even though they had rejected my earlier request to do so. Since the resolution had already been introduced and discussed, I did not have to re-invite them to speak to the FPC members. My intention in re-inviting them, along with the members of the

administration, and Professor Sheila Widnall (an Institute Professor who currently heads the Committee on Discipline) to FPC was to extend the discussion and turn it into a learning opportunity for all. Manning did not attend the meeting because he thought, "it was a set-up." To allay any fear, I offered to Manning and Winston that they did not have to attend that particular FPC meeting in which the members of the administration were to attend; and that I would arrange a separate session of FPC only for them if necessary. But Winston attended the meeting and spoke freely and eloquently, before I asked Chancellor Phil Clay to explain what the administration had learned from the Star Simpson episode.

True, I did invite to the meeting Greg Morgan, MIT's legal counsel, even though Greg was reluctant to attend the FPC meeting! My intention in inviting Greg was not to pose a legal threat to anyone but to better understand the legal environment in which MIT operates now, in the aftermath of 9/11.

At the meeting, after Winston and Clay had spoken, the FPC members raised

> What happened at the next faculty meeting on December 19, 2007, is well known by now. I do not need to interpret every detail of the meeting, except one, which surprised many faculty members on both sides of the resolution.

many questions, some supporting Winston's position on the issue. We carried on the discussion among the FPC members over three additional meetings, parts of which were devoted to this particular issue. The FPC members in general were supportive of the concerns Winston had raised, but there was no general eagerness to humiliate an administration that took FPC seriously, attended the meetings, and engaged in frank discussions with FPC members. As the chair of FPC, I wanted to use the FPC as a forum for deliberations, not as a committee to reprimand the administration.

What happened at the next faculty meeting on December 19, 2007, is well known by now. I do not need to interpret every detail of the meeting, except one, which surprised many faculty members on both sides of the resolution. The way President Emeritus Paul Gray was treated at the meeting, when he wanted to speak, was truly painful to witness.

I have known Paul Gray since 1984 and consider him a very experienced and wise person whose contribution to MIT has been rightly acknowledged by naming the President's residence after him. That someone could stop Paul Gray from speaking at an MIT faculty meeting was beyond my realm of thinking – particularly since in my remarks at the faculty meeting I had publicly asked him to join in the deliberations. Anyone knowledgeable about the rules of MIT faculty meetings should know that the Chair of the Faculty and the President, as the chair of the meeting, can grant speaking privileges to anyone they consider important for the purpose of the meeting. Then why was Paul Gray interrupted and his speaking privileges challenged? And, how could such a cruel breach of common decency and civility be justified as an afterthought in the pages of MIT's *Faculty Newsletter*?

As the chair of the MIT faculty, I offer Paul Gray a sincere apology for not protesting his humiliation at the meeting. And for those who may still like to bar Paul Gray from influencing the discussions at any future faculty meetings, I grant in writing my permission: AS LONG AS I AM THE CHAIR OF THE FACULTY (2007-2009) PAUL GRAY WILL HAVE UNLIMITED SPEAKING PRIVILEGES AT FACULTY MEETINGS. Considering Paul Gray's immense contribution to MIT, this is a small gesture of appreciation I offer on behalf of faculty who care about civility and decency in the public domain. ■

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Comment on Professor Sanyal's response to my article "Finding Polaris and Changing Course"

Kenneth R. Manning

PROFESSOR SANYAL mischaracterizes Professor Winston's motives and mine, and wrings his hands about imagined insults, humiliation, indecency, lack of civility, pain, cruelty, and whatnot.

A lot of what he writes is either off point or marginally relevant. His discourse on the value of Professor Paul Gray's knowledge, experience, and contributions – how much Professor Gray has to share with us, for example – belabors the obvious. I am in full agreement with his assessment and could add more. But if knowledge, experience, and contributions are ample qualifiers for speaking privileges at MIT faculty meetings, then perhaps there are more affiliates, including other professors emeriti, who ought to join Professor Gray on the roster of those allowed, maybe even encouraged, to speak. The more general question is, where do we draw the line?

In December 1985, Professor Gray (as President Gray) told Professor Mel King, an adjunct professor, that he did not have speaking privileges (correctly, by the rules) and that, therefore, he would not be recognized to speak on the South African divestment question then on the floor. As a result, we were denied access to the views of a person highly qualified to speak on the subject by virtue of his knowledge, experience, and contributions on racial issues, nationally and internationally. Perhaps Professor Sanyal, had he been Chair of the Faculty at the time, would have jumped to Professor King's aid as faithfully as he has jumped to Professor Gray's in recent days. We shall never know.

Anyway, let me assure Professor Sanyal once again: no one is out to get him, members of the administration, Professor Gray, or anyone else. Some of us, however, have raised deep concerns about consistency and fairness – how we run our faculty business, how we read and apply the rules, how we cherish and protect our civil liberties, how we treat the most and the least among us, how we present ourselves to the world. We still await a reasoned response. ■

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The Task Force on Student Engagement: A Path Forward

Martin F. Holmes
Leeland B. Ekstrom
Phillip L. Clay
Kirk D. Kolenbrander

We are writing in our capacity as student and administrative leaders regarding an important issue that we have joined forces to address. We have drafted the following joint statement to chart a path for the future.

AS CONCERNED AND COMMITTED members of the community, we have joined together as students and administrators to address an important issue for MIT. We all believe in the importance of collaborating with a broad range of people to discover the most innovative solutions to complex problems. This philosophy is true not only in the science lab and seminar room, but also when making decisions that affect student life.

For this reason it is distressing when communication breaks down between administrators and students on important issues. In recent months, MIT's undergraduates and graduate students have expressed concern about their role in certain decisions, including the way NW-35 was presented to the community, the conversion of Green Hall to undergraduate housing, and communication regarding W1 and student dining. In addition, students have expressed concern about the level of support for MIT students with the recent events that occurred at Logan Airport and the Faculty Club. These concerns and feelings are legitimate, and we want to meaningfully address issues of trust and repair the damage that has been done to the fabric of our community. Together, as students and administrators, we would like to examine a model of collaboration that can achieve this objective and lay the foundation for a productive future.

Each part of MIT has a responsibility for improving student life and making the Institute an even stronger educational and community experience. A key to achieving this common goal is greater collaboration amongst administrators, faculty, and students. Cooperation among these groups demonstrates mutual respect, minimizes

controversy, and promotes a transparent understanding of decision-making. Further, students serve as an important source of information, bringing unique perspectives to any discussion that can lead to better outcomes for the community. Finally, strengthening the role of students aligns with MIT's mission of empowering leaders who are well equipped to study and solve the world's most pressing problems. In short, student involvement strengthens community, provides a comprehensive perspective, and helps prepare a new generation of leaders.

Fortunately, we possess a clear model for positive change. In many cases, students have been given a high level of access and influence and have been successful contributors when exercising such responsibilities. Students serve as full members of most Faculty and Presidential committees, providing valuable insight during the decision-making process. In addition, students have a

history of collaborating with faculty and administrators on a range of specific issues, including numerous senior administration search committees, the recent Task Force on the Undergraduate Educational Commons, and in annual recommendations for setting graduate student stipends.

> . . . we are committed to strengthening the framework for students' role in decision-making. . . . The group will operate under the guiding principles that consultation with students should be the default position whenever practicable.

Building on this tradition, we are committed to strengthening the framework for students' role in decision-making. Initial conversations have led to a commitment to exploring channels for information sharing, maximizing transparency, and promoting the interface between students and administrators at the Institute. Furthermore, we have worked with senior officers to form the Task Force on Student Engagement, which was created with the support of President Hockfield. Senior administrators on the Task Force will include Chancellor Phil Clay, Dean for Student Life Larry Benedict, Dean for Undergraduate Education Dan Hastings, Dean for Graduate Education Steve Lerman, and Vice President for Institute Affairs and Secretary of the Corporation Kirk Kolenbrander. Students will be represented by four undergraduate and four graduate students. The committee will also include two faculty members and

President Hockfield will occasionally participate. This group will not supersede existing structure, but will be an advisory body initially charged with developing a philosophy guiding student involvement, recommending opportunities for greater student participation, and proposing methods to ensure success.

The group will operate under the guiding principles that consultation with students should be the default position whenever practicable. MIT will work with the pre-existing committee structures to explore systematic and consistent portals for student input and open communication. This will all be done with the goal of renewing MIT's culture to more strongly promote and value student involvement in issues important to them. We are collectively committed to preserving and enhancing the long-standing tradition of shared decision-making at MIT. We recognize and acknowledge that this Task Force is not the ultimate solution to important issues of engagement. Rather, it is a next step toward enhancing the relationships, trust, communication, and processes that strengthen our community. ∎

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Faculty Statement of Support for the Task Force on Student Engagement
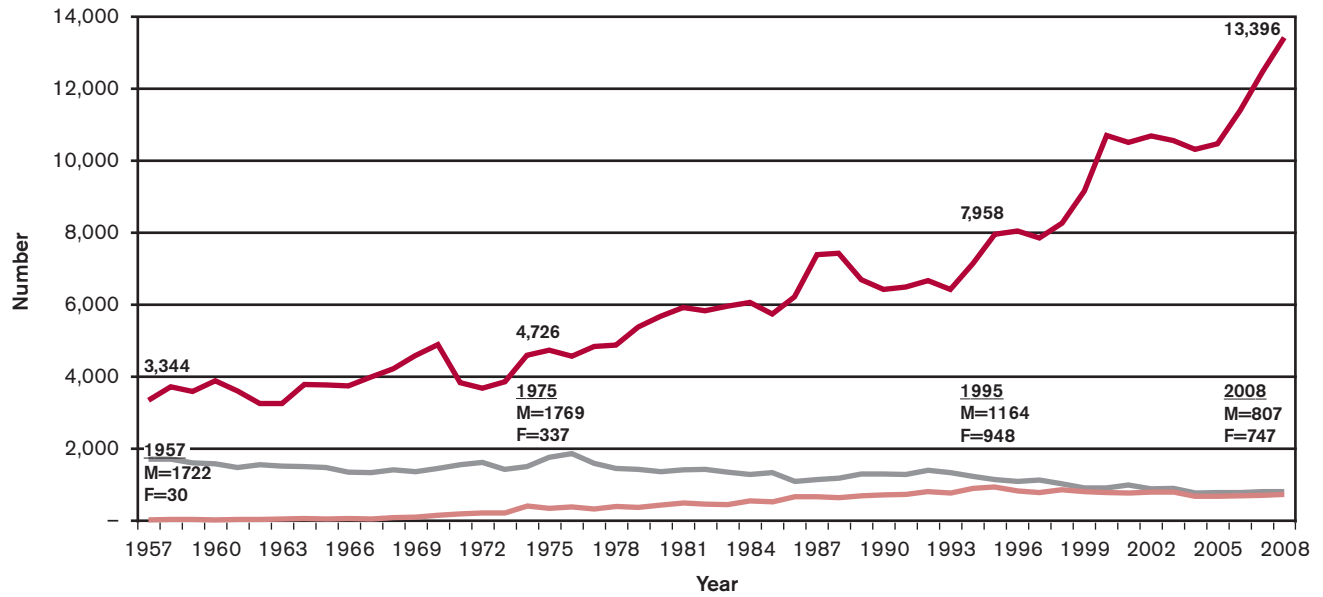
WE, THE UNDERSIGNED FACULTY MEMBERS, consider the issues raised by student leaders to be important matters for the Institute. We believe that it is crucial to take these concerns seriously in order to ensure they are adequately addressed. We understand that there is great opportunity to strengthen community, improve decision-making, and educate student leaders. As an educational institution, we should always take advantage of opportunities to support student learning and development. We applaud the joint effort to address student concerns and look forward to seeing what progress we can make towards these goals.

Hal Abelson	Steve Graves	Jim Orlin
Samuel Allen	Thomas Greytak	David Pesetsky
John Belcher	Diana Henderson	Donald Sadoway
Edmund Bertschinger	Paul Lagace	Warren Seering
Isabelle de Courtivron	Helen Lee	Merritt Roe Smith
Jesus del Alamo	John Little	David Thorburn
Rick Danheiser	Anne McCants	Sheila Widnall
Peter Diamond	Dava Newman	Nigel Wilson
Catherine Drennan	Terry Orlando	JoAnne Yates

M.I.T. Numbers
Undergraduate Admissions (1957–2008)

Legend: Male Admits — Female Admits — Total Applicants

Year	Male Admits	Female Admits	Total Applicants
1957	1,722	30	3,344
1960	1,592	30	3,886
1963	1,529	61	3,260
1966	1,354	71	3,741
1969	1,377	106	4,585
1972	1,625	216	3,673
1975	1,769	337	4,726
1978	1,467	398	4,870
1981	1,426	483	5,922
1984	1,301	553	6,049
1987	1,153	673	7,371
1990	1,309	742	6,423
1993	1,348	792	6,411
1996	1,105	842	8,022
1999	916	826	9,136
2002	898	826	10,664
2005	787	716	10,449
2008	807	747	13,396

Source: Office of Admissions