Senior scientists at MIT and Harvard find their voice amid growing discontent with their institutions' slow progress in hiring and retaining female researchers

Tenured Women Battle to Make It Less Lonely at the Top

"I thought how unpleasant it is to be locked out; and I thought how it is worse perhaps to be locked in."

—Virginia Woolf, contemplating women in academia, in *A Room of One's Own*

CAMBRIDGE, MASSACHUSETTS—It took more than a year of fussing with tape measures, typing out a 13-centimeter stack of pleading memos, and haggling with her department chair, dean, and provost, but Nancy Hopkins finally won an additional 19 square meters of lab space to expand her promising work on the mutagenesis of zebrafish. It wasn't until a few months later, as she sat writing a grant proposal on a cold Saturday morning in early 1994, that the ignominy of the experience hit her.

"I suddenly realized my own insignificance, my lack of value" in the eyes of her colleagues, recalls the 56-year-old tenured molecular biologist at the Massachusetts Institute of Technology (MIT) here. She reran in her mind a long series of unpleasant incidents that had dogged her 26 years at the institute—from the big fight for a little lab space to an ongoing battle with male professors over ownership of an undergraduate course she had developed. And for the first time in her career, she felt that the common thread was gender—that she was of less account than her male colleagues and that her accomplishments were all but invisible in a primarily male world. "It was as if I didn't exist. It was a very strange sensation and very unpleasant. Fortunately, it turned to anger."

The fruits of that anger landed Hopkins on a White House dais this past April, where she discussed gender inequities in her workplace as she sat between an admiring U.S. President Bill Clinton and his wife Hillary. Even more surprising was the astonishing public admission just weeks before by MIT President Charles Vest that the university had been guilty of systematically depriving distinguished women scientists like Hopkins of their fair share of salary, lab space, and other resources.

Hopkins's sudden celebrity coupled with MIT's admission and an accompanying report are part of a new groundswell of concern about the status of women professors in the sciences. A congressionally mandated committee is holding public hearings on the issue, a series of recent symposia have focused attention on the small number of female researchers, and faculty women and sympathetic male colleagues around the country are debating the matter more openly with administrators (*Science*, 11 June, p. 1757).

In contrast to the bitter affirmative action battles of the 1970s and '80s—marked by legislation and angry marches—the new challenge to university administrators is quieter but potentially more formidable, for it is being mounted by respected professors with tenure. They have chosen to spend their careers inside the academic enclave—and so are locked in, as Woolf put it—but now they find themselves frustrated by the glass ceiling that many male and female academics say still separates the sexes at universities. "We probably won't be as radical as [previous activists], since we want to work within the system rather than be confrontational," says Cynthia Friend, the sole woman chemist on Harvard's faculty and co-founder of a new panel seeking to increase the number of women researchers at that university.

Room of her own. Nancy Hopkins with zebrafish in her MIT lab.

CREDIT: SAM OGDEN PHOTOGRAPHY

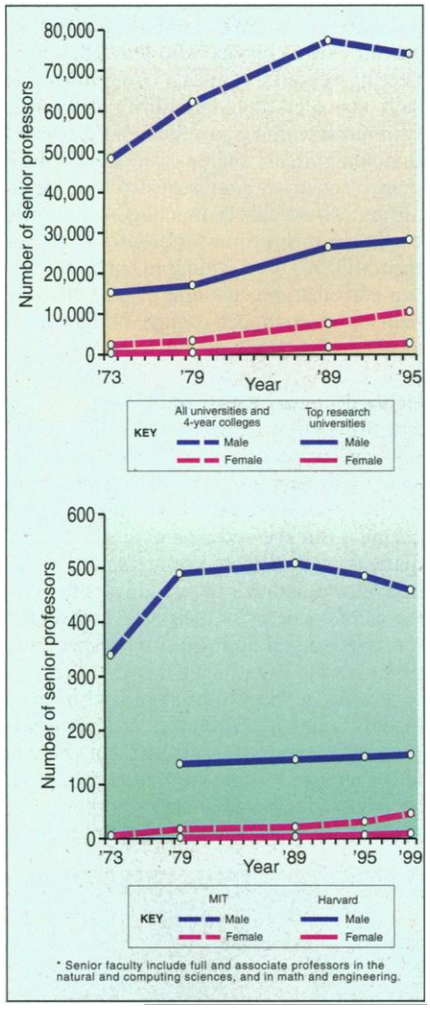
Their task is quite different and in some ways more difficult than that of their predecessors. Rather than confronting open opposition from institutions, they are struggling with subtle inequalities stemming from the unconscious attitudes of individuals. "But the people involved are not going to give up easily, and we're not going away," says Friend. Adds Melissa Franklin, Harvard's first female tenured physicist, "It's up to us to force the issue."

The numbers tell part of the story. After nearly 2 decades of struggle, resulting in considerable gains, women still make up only 12.5% of senior faculty (associate and full professors) in the natural sciences and engineering at all U.S. universities and 4-year colleges (see upper graph), according to National Science Foundation data. In the top 90 U.S. research universities in 1995, less than 10% of senior faculty in those disciplines were women. And at the very top of the academic heap, the numbers are particularly lopsided: In 1995 less than 5% of Harvard's senior faculty were female, and at the MIT campus just down the street, women made up only 6.2% of the top ranks.

Although the percentages of female junior faculty members in all of these categories are roughly double those of full professors—a promising trend—women remain a small minority on science and engineering faculties. And at some institutions, even though the national pool of young women scientists continues to expand (see lower graph), the numbers are moving down rather than up. At Harvard, for instance, the percentage of women junior faculty in the natural sciences dropped from 19.7% in 1995 to 13.7% this year.

The fact that women tend to leave the scientific track at much higher rates than men is well documented (*Science*, 29 March 1996, p. 1901). Now there is disturbing evidence that even the highly successful women who remain in academia and prosper may feel desperately unhappy and out of the loop with their colleagues. That unhappiness gets transmitted to younger women starting out and may help scare a new generation away from

academia, many researchers warn. "I've talked to many female students who tell me, 'I don't want to be like you' " because of the treatment of women, says MIT materials scientist Lorna Gibson. Other MIT and Harvard female professors repeat that story.



Slow growth. The number of senior women on U.S. science and engineering faculties has been on the rise for more than 25 years, but top research universities—and particularly MIT and Harvard—lag behind their sister institutions in hiring and promoting women.

The situation may be most acute at leading institutions, where, for reasons that are under debate, senior women tend to be fewer and thus more isolated. A close look at women scientists at two of the nation's top universities, Harvard and MIT, reveals trends that likely affect women at most research universities, but are more acute and visible at these two elite schools. At MIT, the administration has admitted the problem and started on solutions, but most observers say that Harvard is only beginning to struggle more openly with this sensitive issue. And the way these top schools deal with the problem of women faculty inevitably will have national effects. "When an institution like MIT says, 'Yes, we have a problem,' it puts a lot of pressure on everyone else," says Marc Kastner, chair of MIT's physics department.

Hopkins has clear evidence that the concerns she helped raise extend beyond Cambridge. Since spring she has received a flood of phone calls from women academics asking advice (see sidebar on p. 1278) as well as numerous invitations to speak on the topic around the country. "It's pretty clear this is a general problem," she says.

MIT's quiet revolution

Hopkins is an unlikely ringleader for women's rights. Her prim manner, conservative dress, and the slight English accent inherited from her mother are hardly evocative of an academic radical. "Feminism?" she asks. "I avoided it like the plague throughout my entire career. I just ran from it. I didn't have this problem; I thought it belonged to a previous generation." Nobel Prize–winning biologist Barbara McClintock, who befriended Hopkins early in her career, tried to warn her. She said that in terms of discrimination, "to be a woman scientist is worse than to be black in America," recalls Hopkins, who was aghast at the comparison. In a 1976 letter to her young colleague, McClintock noted that "successful competition with men is just out of the question ... even when the woman is intellectually superior." At the time, Hopkins thought the message too harsh. "I didn't want to hear it. I felt totally accepted."

It wasn't until nearly 20 years later, secure in an MIT tenured professorship, that her first real doubts were sown as she struggled for the additional lab space. Then a course she had developed was taken over by other (male) professors, who wanted to commercialize it, and she stopped teaching entirely in protest. After her realization in January 1994, she decided to send a letter to Vest spelling out her mistreatment, and she asked a politically savvy female colleague to read it first. When that woman, whom Hopkins declines to name, asked to sign it as well, "I was completely dumbfounded. I wasn't alone anymore." With trepidation, Hopkins and two other colleagues began to talk with the other 14 tenured MIT women scientists among a total science faculty of 280. "I was so embarrassed—these were very distinguished researchers, and I worried they would think I was one of those feminist types who just isn't good enough so I'm complaining," says Hopkins.

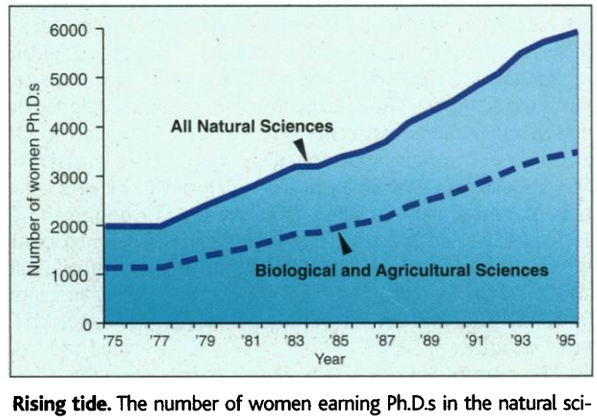
The women had never before met as a group, but they quickly discovered common ground. Within weeks, all but one agreed there was a problem that required immediate action, and they scheduled an audience in August with Robert Birgeneau, dean of sciences. They spent hours discussing strategy and even held a dress rehearsal to ensure they got their points across succinctly. But they were nervous about their reception. "He could have brushed us off in a dean-like way, and that would have been it," says Hopkins.

Religious experience

Birgeneau, to their surprise, was ready to listen. A lanky 57-year-old physicist, father of three ambitious daughters and husband of a social worker, the dean calls himself "attuned to social issues." One colleague credits his open-mindedness to his Canadian heritage. "Canadians do have a deep-rooted sense of fairness—it's deep in the culture," Birgeneau adds. MIT was also facing other gender-related problems at the time, including a lawsuit by a former female engineering professor who was denied tenure (see sidebar on p. 1275), although Birgeneau was not involved.

To the dean, the meeting in his conference room that August day was "akin to a religious experience." Each woman took a turn discussing her career at MIT, relating stories of condescension from male colleagues, a veil of invisibility that seemed to drape their accomplishments, and general frustration over benefits, resources, and administration support. The women agreed that the slights were typically not overt but rather stemmed from unconscious attitudes. Senior women simply did not get as much respect from their colleagues as senior men. "Death by a thousand pinpricks" is how one woman describes the experience.

The effect on Birgeneau, he recalls, was electrifying. "It was not possible to explain why the vast majority were extremely unhappy people" because of purely individual experiences, he says. "I became convinced

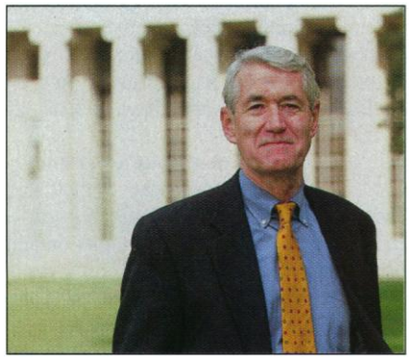


Rising tide. The number of women earning Ph.D.s in the natural sciences has been increasing steadily during the last 2 decades.

CREDITS: (TOP TO BOTTOM) NSF; MIT; AND HARVARD; NSF

that this was a systemic issue." He agreed that the women could form a committee to gather data.

Hopkins says she and her colleagues "floated out of the office and danced down the street." Soon after, however, Birgeneau appeared at Hopkins's office door with news of a snag: Department chairs were reluctant to admit that there was any kind of discrimination—conscious or unconscious—and strongly opposed creation of the committee. They feared that the panel could unnecessarily open a can of worms by digging for data on sensitive matters such as salary and lab space—typically confidential matters at a private university such as MIT.



Hero. Dean Birgeneau was ready to listen.

But the effort went forward, thanks in large part to Birgeneau, who with the support of Vest brought the two sides together. Hopkins recalls an impasse at a 27 September 1994 meeting between the women and the seven male department heads in which six of the seven remained opposed. "They just sat there looking stony," says Hopkins. But Birgeneau brokered a deal to add several distinguished male scientists to the committee, defusing the opposition, and the panel first met in February 1995.

The data that the group gathered over the next 3 years with the dean's assistance surprised even the tenured women. In one department, for example, they discovered that although both male and female junior faculty members had roughly 185 square meters of lab space, senior male faculty members had about 280 square meters, whereas their female counterparts had the same amount as their juniors, according to unpublished charts assembled by the committee. The number of university-granted awards within departments was often similarly skewed as well.

Perhaps the most shocking statistic was the most obvious: The total number of female faculty members in the sciences had not changed much since the days when McClintock had written to the young Hopkins. For more than 10 years, from the late 1970s to the mid-1990s, the figure had hovered around 20, out of about 280, or about 7.1%—a period during which the national pool of female science Ph.D.s grew steadily.

The committee also interviewed each woman professor in depth. They found that although junior women had relatively few complaints, tenured women felt marginalized and excluded from the workings of their departments. For example, several said they were excluded from search committees and encouraged to do more teaching than research. "The data part of the report has been overrated," says Birgeneau. "The descriptive part is as important as the objective part. If these outstanding and high-achieving people—in the top 1% of women in the country by any measure—are miserable, that is a crucial kind of data point." Much of the unhappiness, he says, originated in "daily insults—mostly unintended—and in obvious things like [space]."

Birgeneau didn't wait for a final report to move on the most obvious problems. "They started fixing things immediately," Hopkins says. "Salaries, space, awards ... they got right on it. It was a wonderful thing." The dean also focused on building up the numbers of female faculty members: "I put a lot of pressure on the department heads to make sure they were working hard to find women candidates—and that has been very successful." And indeed, since 1994, the number of women faculty in the school of science has grown more than 50%, from 22 to 34, as the number of men dropped from 252 to 222. The math department, for example, had no women, and now has four. Physics chair Kastner says that "it is absolutely necessary to change our attitudes," adding that he and his colleagues "scour the landscape" for qualified female candidates and compete fiercely with other institutions to get them.

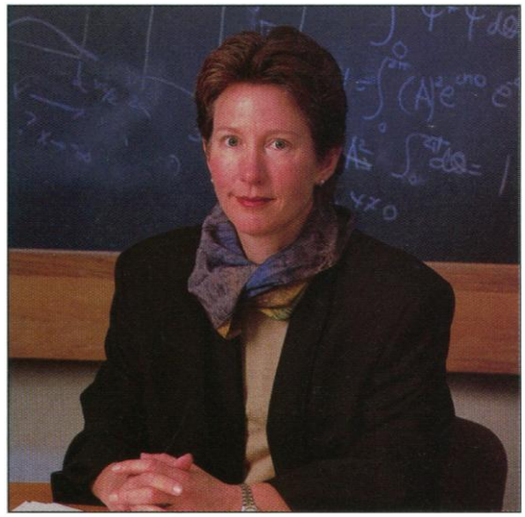
The report included an extensive rebuttal from male colleagues, who in several cases said that the negative statements were simply untrue. One MIT official denied a written statement by three of his female colleagues alleging a long-standing pattern of discriminatory behavior, according to sources familiar with the document. Despite the rebuttal, the administration clearly took the women's concerns seriously, and although the 150-page report was deemed confidential, a summary was made public last spring, generating an unprecedented wave of publicity for MIT. That publicity culminated in Hopkins's trip to the White House and the Clintons' praise of the university for doing the right thing—and for creating what they said should be "a model for the rest of higher education."

MIT is now setting up similar committees in the other four schools—engineering, architecture, humanities and social sciences, and management. Each will examine teaching loads, search committee membership, and benefits, along with salaries, space, and award issues. "We want this effort to spread," says Gibson, who leads the engineering school's women's committee. She says she feels that the administration is committed to doing so, although she worries that some areas, such as benefits—which many women say are out of step with the realities of two-career marriages and child care—require a more dramatic overhaul than MIT has been willing to consider. Gibson adds that the spotlight of publicity will help ensure continued change: "If they don't keep moving, they will look hypocritical."

Harvard women: Rarest of the rare

Just two subway stops away, Cynthia Friend says she has no complaints about salary, resources, or benefits. "I've been treated very well by the university," says the Harvard chemist. But she and a handful of other female as well as male senior faculty members at the nation's oldest university echo the chief concerns of their MIT colleagues: too few women and too little respect and power for the few who are there.

Friend, a trim 45-year-old with more than 17 years of experience at Harvard, is wary of discussing matters that don't pertain to her number one priority, research. But after a busy day teaching class, working with graduate students, and writing grant proposals, she hesitantly confesses to an intense feeling of isolation in her tenured job. "I'm often excluded from informal meetings and interactions, where comments are made and

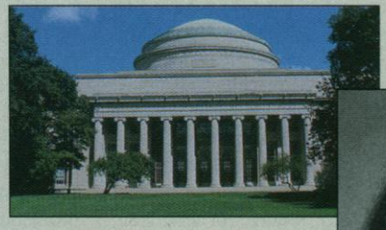


Seeking critical mass. Harvard's Friend wants more respect—and more women colleagues.

CREDITS: (TOP AND BOTTOM) SAM OGDEN PHOTOGRAPHY

MIT as 'Intractable Enemy'

Today women from Hillary Clinton on down are praising the Massachusetts Institute of Technology (MIT) for recognizing and beginning to correct its unfair treatment of female scientists (see main text). But 5 years ago, at least one woman viewed the prestigious school not as an ally but as a powerful enemy. In 1994, the same year that senior biologist Nancy Hopkins and her colleagues were taking grievances to their superiors and finding a compassionate ear in the school of science, the MIT administration was fighting a messy sex discrimination suit involving the school of engineering. The suit was filed by Gretchen Kalonji, an associate professor in the materials science and engineering department, who specializes in crystalline defects and their effects on the physical properties of materials. With a bachelor of science degree and a Ph.D. from MIT, she was the second woman to be hired by the department. By 1986 she was an associate professor on the tenure track. "The situation was grave for junior women," several of whom did not get tenure, she recalls.



Tenure material? Kalonji sued MIT after being denied tenure.

Kalonji herself was turned down for tenure in 1988. Arguing that she was qualified for tenure and had been discriminated against because she was female, she appealed to the dean of the school of engineering, who organized a committee to examine the matter. That group found that the tenure process was "unacceptably flawed," according to the committee's confidential report, which was presented to the dean and obtained by *Science*. The investigators determined that the department "was less supportive of women" and that Kalonji faced "a higher hurdle than some males." In addition, "senior male members of the department stereotype women, making the atmosphere inherently more difficult for women."

Kalonji's lawyer, Michael Altman of Boston, says that faculty members on the tenure committee who were interviewed as part of the investigation noted that "people talked about the fact that she was married to an African and was politically left." Kalonji adds that she was actively pressing for university divestiture of its holdings in South Africa because of that country's apartheid policies, and that this had created tension between her and her colleagues and superiors.

The dean organized a second committee to reevaluate the tenure panel's decision. According to Kalonji, he ordered members not to consider the disadvantages Kalonji may have faced as a result of discrimination, but only her credentials. The committee denied her tenure again, and in 1991 the dean confirmed that decision. By then, Kalonji had moved to a position at the University of Washington, Seattle, where she has tenure today.

After 3 years of fruitless waiting for a backlogged Massachusetts state office to consider her complaint, Kalonji instead filed suit in federal court in 1994. She argued that her research support had been minimal, that she had been granted far less lab space than her male colleagues, and that she had been pushed into working on a defense contract that impeded more prestigious research. All of those disadvantages affected her tenure bid, she maintained.

The university strongly denied that any discrimination had occurred. One MIT official familiar with the suit says Kalonji made a persuasive case, but another university source recalls that there was a general feeling in the engineering school that she lacked the qualifications for tenure. The university fought hard to prove that point. "MIT proved the most intractable of enemies," says another university official. At the eleventh hour, just as the dispute was to go before a judge in 1995, MIT agreed to settle for an undisclosed amount. Kalonji received the last of a series of payments in January, and, at her insistence, MIT also agreed to spend at least $50,000 a year for 5 years on a national program encouraging women and minority grad students and postdocs to move onto university faculties. Kalonji initially chaired the effort but has since relinquished the position, and she says that the program appears to have languished.

A joint 1995 statement by Kalonji and then–MIT Provost Mark Wrighton, now chancellor at Washington University in St. Louis, announced the new program as a "key element" in her withdrawal of the suit. Wrighton did not return phone calls, but current MIT officials say the welcome granted to disgruntled women in the school of science that same year was not connected to the diversity initiative or to Kalonji's suit. But Kalonji feels that "the suit had a positive effect. The fact that they were forced to settle with me woke up the administration." **–A.L.**

decisions taken behind the scenes," she says.

Friend is in fact quite isolated: She is the sole woman among Harvard's 21 chemistry faculty and one of only 10 tenured women, out of 156 tenured professors, in the natural sciences. One-third of Harvard's natural science departments have no senior women at all, and nearly half have no junior female faculty members. Even the two biology departments—where, for nearly a generation, half the graduate students have been women—have only seven women out of a total faculty of 55, or 12.7%. In other words, says Friend, Harvard lacks a critical mass of women in the sciences. "We can't do the kind of report MIT did," she adds. "We don't have the numbers to do anything that is statistically meaningful."

None of this particularly bothered her as a junior professor intent solely on research, says Friend, echoing the pattern laid out in the MIT report. It is only as a mature faculty member, trying to have an impact on the institution, whether in organizational issues, hiring, or student requirements, that she has become frustrated. "This isn't about quality of life; this is really about power, about respect from colleagues," she says.

As a first step, Friend set out to change the statistics. She joined forces with John Dowling, a tenured microbiologist who has watched with concern for more than 25 years as talented female graduate students and postdocs left for jobs in publishing, teaching, and industry. The pair then signed on three other like-minded men and women, including computer scientist Barbara Grosz, who chaired a 1991 panel that concluded that Harvard was having "serious difficulties" attracting women to its science graduate programs and faculty. Their common goal: more female hires.

This past July, they gained an audience with Jeremy Knowles, the powerful dean of Harvard's arts and sciences faculty, in his elegant corner office overlooking Harvard Yard. The courteous 64-year-old chemist welcomed their initiative to encourage the hiring of more women scientists at both the junior and senior levels. Their plan is not to force more hires but rather to meet with department chairs to create a strategy for increasing the pool of women candidates in

CREDITS: (LEFT TO RIGHT) D. COVENEY/MIT; UNIVERSITY OF WASHINGTON

each discipline, starting with chemistry and the two biology departments. "It is absolutely essential that departments come up with plans to track and recruit women to join the faculty," says Grosz. "Not a quota system, but a way to ensure that serious women candidates are being considered."

No quotas. But Harvard needs a clear plan to attract women, says computer scientist Grosz.

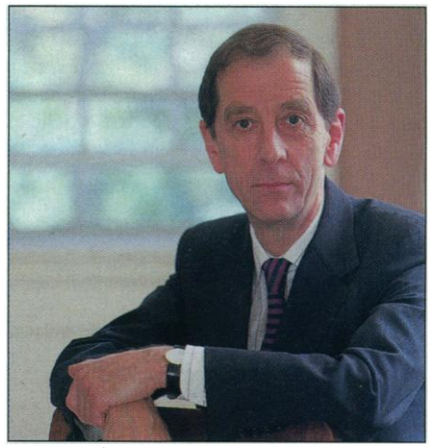
The group has no formal power, but it does have the dean's imprimatur in the form of a 28 September letter urging cooperation, which was sent to the entire natural sciences faculty, as well as administrative support from his staff. The panel members, however, say they will not write an MIT-style report. "Our objective is action," says Friend.

Knowles is under pressure from above as well as from below. The university's board of directors, called overseers, last spring urged Harvard President Neil Rudenstine in a confidential report to take specific steps as quickly as possible to increase the number of women faculty in all departments. Although Harvard officials declined to release the report, which was written for Rudenstine by an overseers' subcommittee, overseers say the message is clear. "The numbers are deplorable," says Charlotte Armstrong, a New York management consultant and Harvard alumnus who chaired the subcommittee. "This has been a gnawing problem for too long, and something should be done," particularly about the stagnant numbers of junior women faculty members. "And in science, the problems are more acute and require more attention," she adds.

What's more, there is a perception among some leading outsiders that Harvard is out of step on the matter of women. "There is some feeling outside Harvard that it is not really serious about promoting women," says Marye Ann Fox, chancellor at North Carolina State University in Raleigh. In Harvard's defense, Knowles notes that the number of tenured women on the natural sciences faculty has more than doubled—from four to 10—since he took the job in 1991, the same year MIT's Birgeneau became dean. "It's getting to be not such a small number," he adds delicately. And he and other Harvard administrators also stress that many of the issues raised in the MIT report are not a problem at Harvard. For example, Knowles, not the department chairs, sets senior professor salaries, and junior salaries are on a scale; lab space is allocated not solely by department chairs but is subject to central control. Says Carol Thompson, Knowles's associate dean for academic affairs: "We don't have the same kinds of problems" as neighboring MIT.

Poor pickings

All the same, the Friend panel confronts an organization entrenched in its traditions. Once someone receives Harvard tenure, for example, it is extremely rare for him or her to leave. "I can turn over the whole college in 4 years," says Knowles, "but the tenured faculty takes more than 35." That means fewer slots and many old men. Second, Harvard in the past has opted to bring in world-class scientists from outside and very rarely promoted junior faculty, "though the most successful tenured women [at Harvard] come from within the junior ranks," says Joan Hutchins, a Los Angeles manufacturing executive and chair of the Harvard overseers. And Friend notes that "competition is high for senior women candidates, and they are often not as mobile." Knowles notes that the tradition is changing: Today, nearly 40% of full professors came from within.



In the middle. Harvard's Dean Knowles is under pressure from above and below.

Perhaps the most intractable tradition is the mysterious process that transforms a junior professor into a member of the elite caste of tenured Harvard professors—a remarkably grueling procedure in which a panel of outside experts vets candidates. Each professor in the department writes a confidential letter to the committee, and ultimately the president makes the closely held decision. One male professor familiar with the process says it judges candidates on their merit. "We don't look at sex or ethnicity or other nonintellectual qualifications," he says. "It's all what they published, their status, and how clear their thinking is."

The reason there are so few tenured women, several department chairs say, is not discrimination but simply that there are so few qualified women candidates in most natural sciences. "The existing pool is just too male-dominated—there are not many women," says Ramesh Narayan, who heads the 17-member astronomy department, which has two women—one of whom was tenured earlier this fall and one whose status is in dispute (see sidebar on p. 1277). "The pickings are just not very good," adds another.

But that's not the way Friend and others see it. They note that the steadily growing pool of women candidates in all disciplines outpaces Harvard's hiring. And the tenure process "is an invitation to abuse," says Howard Georgi, a Harvard physicist who has served on search committees and is a member of the new panel. "There's no question this has affected women." The letter in particular allows faculty members to slight those candidates who may be different in any way, he says. "It is easier for someone who is exactly the same as everybody else on the faculty to get tenure." Friend agrees, saying that "there's a tendency to use the reflecting pool method of hiring—which means you have a bunch of faculty who see themselves and that's who they hire."

Her group argues that there are excellent qualified women out there—if one troubles to look for them. The panel therefore plans to work with the departments to find them. "We don't dig like we should," says microbiologist Dowling. "We can't sit still. We need to be aggressive." Department heads promise that they are open to the idea. "I don't know what more we can do, but we will listen to what they have to say," says Narayan. And Hutchins says she hopes the new Radcliffe Institute—formerly the college for women—which plans to bring promising women scholars to the Harvard campus for a year, will provide a forum for showcasing top-notch women.

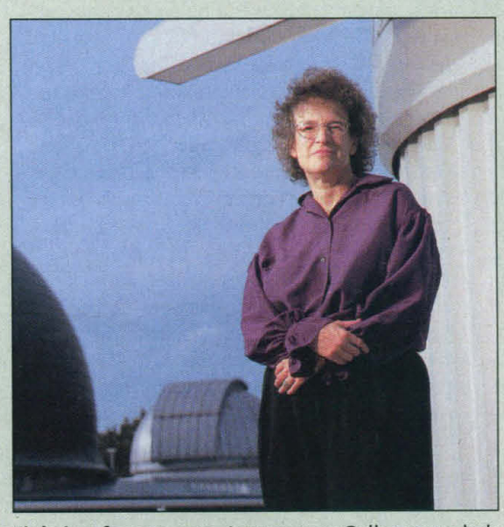
Ultimately, tracking progress and encouraging action falls to those at the top,

CREDITS: (TOP AND BOTTOM) SAM OGDEN PHOTOGRAPHY

Margaret Geller: Battling Discrimination or Bureaucracy?

One morning in mid-May 1997, astronomer Margaret Geller received a letter from Jeremy Knowles, dean of Harvard University's faculty of arts and sciences, offering her a Mallinckrodt chair at Harvard—an honor traditionally reserved for outstanding tenured scholars at the university. Geller, a researcher at the Harvard-Smithsonian Center for Astrophysics, was euphoric, and she rushed out of her office to tell one of her graduate students the good news. But when she learned that Harvard tenure did not come with the chair, her euphoria turned to fury.

Two years later, Geller still has not accepted the chair, and she and Harvard remain locked in an increasingly acrimonious battle over her status. Geller argues that her lack of tenure is a result of ill-concealed sex discrimination, the latest attempt by Harvard to deprive a distinguished woman scientist of its powerful stamp of approval and support. But university administrators say gender has nothing to do with the matter. They argue that bureaucratic reality—which also prevents Geller's male colleagues at the Harvard-Smithsonian center from receiving tenure—is the true stumbling block, which they are working in good faith to remove.



Fighting for respect. Astronomer Geller says she's been slighted by not receiving Harvard tenure.

CREDIT: SAM OGDEN PHOTOGRAPHY

University officials do not question her credentials. Geller, 51 years old, the second woman to receive a physics Ph.D. at Princeton, is a member of the National Academy of Sciences and recipient of a coveted MacArthur fellowship, or "genius grant." Her work plotting the distribution of galaxies with John Huchra, also a Harvard-Smithsonian professor, showed that matter hugs the edges of enormous voids and has an organized rather than a random pattern. (Ironically, the initial organized pattern was dubbed the Harvard Stick Man.) "She's quite a distinguished researcher with a lot of respect in the community," says Princeton astronomer Ed Turner.

Geller was a budding junior faculty member at Harvard during the early 1980s. Then in 1986, before she came up for tenure, she resigned and moved to the Smithsonian side of the center. Although she declines to discuss why she left, colleagues say Geller felt the sting of discrimination as a female Harvard professor and was devastated when senior professors ridiculed her, saying that as a woman "she didn't have a snowball's chance in hell at getting Harvard tenure."

She is now subject to the complex rules governing the joint Harvard-Smithsonian Center, down the street from Harvard's Cambridge campus. As a Smithsonian employee, she does not have Harvard tenure, even though she and her half-dozen male colleagues have already successfully passed through the difficult Harvard tenure process, which made them senior members of the Harvard astronomy faculty. They are Smithsonian civil servants, although some, like Geller and her colleague Huchra, receive an additional partial salary from Harvard (25% in Geller's case). But should Smithsonian funding dry up, Harvard is under no commitment to pick up their full salaries.

This rankles Geller, who teaches a full course at Harvard each semester, mentors graduate students, and until recently spoke frequently at Harvard alumni and fund-raising events, often winning praise from university administrators, including a congratulatory letter from Knowles. "I have a commitment to Harvard, but Harvard does not have a commitment to me," she says. Geller also notes that Harvard's past credentials with regard to promoting women are less than stellar. For example, earlier this century, when other schools had tenured women on their faculties, Harvard dallied for decades before awarding tenure to such renowned scientists as variable star expert Cecilia Payne-Gaposchkin and biologist Ruth Turner. Today, Geller is also angered that Harvard counts her as tenured faculty on its lists, boosting the apparent numbers of tenured women.

A Harvard official acknowledges that Geller's strange status creates "a sense of second-class citizenship" but adds that Smithsonian professors also receive benefits that their Harvard colleagues do not get, such as 12-month salaries and federal benefits. "Margaret is in the same position as six other [distinguished professors]," says Irwin Shapiro, center director. "Three are members of the National Academy, and most have won prizes." Adds a Harvard official: "We felt we couldn't single out Margaret."

The offer of a Mallinckrodt chair, however, did single Geller out, as her colleagues did not receive this honor. After the written offer in May, however, Knowles sent Geller a letter on 16 June citing her "scholarly eminence and distinction" but noting that there would be no impact "on [her] economic or contractual relationships." Geller was incensed. "I decided not to live the lie of this professorial title," she says, and she has yet to decline or accept the offer, leaving the proffered chair in limbo.

Knowles declines to discuss the matter, but university and Smithsonian sources say that the offer of a chair was an attempt to placate Geller that clearly backfired. "The university is afraid that if they tenure her, the rest of [the Smithsonian faculty] will get pissed off and leave," says one source. "We'd have six other people in line," adds another official. And one colleague complains: "She's treated with kid gloves. She's already made herself first among equals. It's not fair that she alone gets tenure."

Officials from both institutions are now working on a plan to grant all the Smithsonian professors Harvard tenure with a financial commitment by the university. That outrages Geller, who says that an en masse tenureship diminishes the honor. "I'm worth that many men?" she quips. She says that "[Harvard astronomy chair Ramesh] Narayan and Shapiro used my situation to push forward a plan to tenure all Smithsonian professors regardless of stature." Both men reject that idea. "We've been trying to win equity for years," says Shapiro. "There is no gender component to this story," adds Narayan.

Members of a fledgling panel organized to help increase the numbers of women in the sciences at Harvard (see main text) declined to comment on Geller's situation, saying they do not know enough about the particulars. But the astronomer attracts plenty of off-the-record carping at Harvard. One male academic describes Geller as having "a bee in her bonnet." And a colleague sympathetic to her plight says, "She has a confrontational style that magnifies the problem." To Geller such criticism is, if anything, more evidence that gender is indeed part of her problem, because women fighting discrimination traditionally have been dismissed as difficult or confrontational. "A lot of women are called such names when they stand up for what they merit, while a man would just be called aggressive," she says. Her effort, she adds, has stopped short of legal action but has cost her enormous mental distress and hurt her health. "These men," she fumes, "can't imagine having something like this happen to them." **–A.L.**

and some are skeptical that hiring women is a priority at Harvard's most senior levels. "Saying this is a departmental issue is really passing the buck," says one female former junior professor who left Harvard after not getting tenure. "There has to be a clear and specific directive at the level of the dean and the president." Dudley Hirschbach, a Harvard chemist on the new panel, adds: "The attitude here is 'Oh yes, we would like more women,' but because no one is focused on this attitude, change is very slow."

But, as at MIT, change is possible. Georgi describes the physics department in the 1980s as a male club that was "something out of an old English novel." But while chair in the early 1990s, he made the issue of women a top priority, and junior professor Melissa Franklin became the first tenured woman in physics. Since then, two more women have joined the senior ranks. Did he meet resistance? "Resistance is the wrong word—it was more bemusement and lack of understanding," he says.

Despite the relatively progressive atmosphere among Harvard physicists, however, Franklin says "this is not the nicest place to be an old woman. People are still condescending. They can be pretty rude." She recalls, for example, being asked in a departmental meeting to speak more quietly. "It was as if I was being told to be somebody else," she says. How does she cope? "You move a little way out of the action; you do your own thing," she says. "And sometimes I go into my secretary's office and cry."

Fairy-tale ending?

The winds of discontent at MIT and Harvard appear to be spreading south and west. When MIT physicist and Harvard overseer Mildred Dresselhaus visited the University of Texas, Austin, in September to discuss research matters, she was ushered into an auditorium of 250 people eager to hear about the MIT report and her experiences as a woman scientist. The next morning, a dozen female postdocs bombarded her with questions at breakfast. "This is a front-page item," she says. "There's a lot going on." Hopkins reports similar reactions during her visits to universities ranging from the California Institute of Technology in Pasadena to the University of Vermont, Burlington, to discuss gender issues. "The universality of [those issues] is completely astounding," she says. Although eager to return to full-time research, Hopkins adds that she feels obliged to respond to the barrage of interest in the subject. "It's awkward, but how can I avoid it?" she asks.

Meanwhile, the congressionally chartered Commission on the Advancement of Women and Minorities in Science, Engineering, and Technology Development is holding public hearings (the next will be held 7 December at the National Institutes of Health in Bethesda, Maryland) and is formulating a report on specific strategies for how to deal with the slow pace of change in academia as well as business and government. Hopkins advocates radical action by the commission—even recommending that federal research dollars go to easing the struggles of women scientists through child-care funding, for example.

She and others maintain that universities and science as a whole will be the ultimate beneficiaries of the push to boost the numbers and improve the lot of women researchers in academia. "This is not a women's issue—this is a university issue," says Harvard's Grosz. "If we are not getting the best women, we are not getting the best people. We are supposed to be the best university in the world, so we ought to have the best women. Why don't we?"

Improving the lives of female professors will also likely have a long-lasting effect on the career choices of the next generation, advocates say. If role models feel marginalized, female students are likely to opt out of academia. "Doing the MIT study turned out to be a very good investment in terms of increased productivity and quality of life for the faculty," says Dresselhaus. "But the biggest impact is on graduate students and even undergraduates who view careers in academia as undesirable."

Certainly students encountering Hopkins today will get a different picture of life in academia than those who met her 5 years ago. Although she still worries that recent gains are fragile, her research is blossoming, she was recently named a member of the National Academy of Sciences' Institute of Medicine, and the change in attitude toward women at MIT has in turn transformed her own attitude. "I used to be so unhappy much of the time," she says, bustling out of her cluttered office in a white coat and down the hall to the lab where her zebrafish swim. "Learning how to access the resources of MIT, my own life has become a fairy tale. I feel incredibly lucky to be here now."

–ANDREW LAWLER

Andrew Lawler is a *Science* staff writer and former Knight Science Journalism fellow at the Massachusetts Institute of Technology.

From MIT, a Primer on Boosting Women's Status

For researchers eager to improve the position of women at their own institutions, scientists from the Massachusetts Institute of Technology (MIT) offer some hard-won advice.

- **Start From Grass Roots:** An edict from above is not enough. "Women have to organize themselves," says Robert Birgeneau, dean of sciences at MIT. Such organization puts pressure on the administration to act.
- **Safety in Numbers:** The great lesson for Nancy Hopkins, the biologist who kicked off the MIT effort, is the power of solidarity. "Depend on the power of the group, because it works," she says. "If you all go to the administration, they can't say there's no problem." That means first building trust with one another, adds MIT biologist and engineer Penny Chisholm. "Suspend suspicions among yourselves, overlook cultural and departmental differences, and get to the common experiences."
- **Find an Administrative Ally:** "You have to have a Dean Birgeneau," says Hopkins, lest the effort languish in the university bureaucracy. MIT's dean of science was the hero of the MIT saga, according to many women involved. He took their claims seriously, gained the support of MIT's president, and worked tirelessly to forge innovative compromises.
- **Include Men:** "It's very important to have well-respected male faculty on board," says Birgeneau. They add credibility, defuse tensions, and can help win over male colleagues. "At first I was against [including men]," says Hopkins, "but the dean turned out to be absolutely correct."
- **Collect Data, Not Enemies:** "A spirit of cooperation works better than confrontation," says Birgeneau. Gathering data and quietly discussing it was more effective than loud protests, say some MIT faculty members. And data gathered internally are likely to be more valuable than those produced by outside consultants, who may have a hard time penetrating departmental cultures, says Hopkins.
- **Get the Resources:** Hopkins skipped teaching for 2 years while she spent 30 to 40 hours a week gathering data and conducting interviews. "The institution has to say this is important enough to give you relief from teaching," she says. And Birgeneau says if he had to do it over again, he would hire a full-time assistant to help.
- **Seek Out Personal Stories:** Some science faculties, such as that of Harvard University, have too few women to make statistical analysis meaningful, but individual interviews can provide important insights, too. Allowing women to speak confidentially helps ease fears of retribution, Hopkins adds.

She says that an organized, visible effort is far more effective than fighting individual battles. "Changing hearts and minds one by one is much too slow," she says. "You have to change the institution, and the hearts and minds will follow." **–A.L.**