

December 19, 2006

Women in Science: The Battle Moves to the Trenches

By [CORNELIA DEAN](#)

HOUSTON — Since the 1970s, women have surged into science and engineering classes in larger and larger numbers, even at top-tier institutions like the [Massachusetts Institute of Technology](#), where half the undergraduate science majors and more than a third of the engineering students are women. Half of the nation's medical students are women, and for decades the numbers have been rising similarly in disciplines like biology and mathematics.

Yet studies show that women in science still routinely receive less research support than their male colleagues, and they have not reached the top academic ranks in numbers anything like their growing presence would suggest.

For example, at top-tier institutions only about 15 percent of full professors in social, behavioral or life sciences are women, “and these are the only fields in science and engineering where the proportion of women reaches into the double digits,” an expert panel convened by the [National Academy of Sciences](#) reported in September. And at each step on the academic ladder, more women than men leave science and engineering.

So in government agencies, at scientific organizations and on university campuses, female scientists are asking why, and wondering what they can do about it. The Association for Women in Science, the [National Science Foundation](#) and the [National Research Council](#) are among the groups tackling these issues. In just the past two months, conferences have been held at [Columbia University](#) and the [City University of New York](#) graduate center. [Harvard](#) has a yearlong lecture series on “Women, Science and Society.”

This fall, female scientists at [Rice University](#) here gathered promising women who are graduate students and postdoctoral fellows to help them learn skills that they will need to deal with the perils of job hunting, promotion and tenure in high-stakes academic science.

“The reality is there are barriers that women face,” said Kathleen S. Matthews, the dean of natural sciences at Rice, who spoke at the meeting's opening dinner. “There are circles and communities of engagement where women are by and large not included.”

Organizers of these events dismiss the idea voiced in 2005 by [Lawrence H. Summers](#), then president of Harvard, that women over all are handicapped as scientists because as a group they are somehow innately deficient in mathematics. The organizers point to ample evidence that any performance gap between men and women is changeable and is shrinking to the vanishing point.

Instead, they talk about what they have to know and do to get ahead. They talk about unspoken, even unconscious sexism that means they must be better than men to be thought as good — that they must, as one Rice participant put it, literally and figuratively wear a suit and heels, while men can relax in jeans.

They muse on the importance of mentoring and other professional support and talk about ways women can provide it for each other if they do not receive it from their professors or advisers.

And they obsess about what they call “the two body problem,” the extreme difficulty of reconciling a demanding career in science with marriage and a family — especially, as is more often the case for women than men in science, when the spouse also has scientific ambitions.

Just having a chance to talk about these issues with others who face them lifts some of the burden, said Marla Geha, a postdoctoral fellow in astronomy at the Carnegie Observatories in Pasadena, Calif., who attended the Rice meeting. “It’s even just knowing there’s someone else out there going through the same things.”

For Princess Imoukhuede, who is working for her doctorate in bioengineering at the [California Institute of Technology](#), the Rice conference was helpful because “this is a difficult issue to talk about.”

“There is a perception in science that all things are equal,” Ms. Imoukhuede said. “But gender actually does matter, and by the same token, race, too.”

One issue is negotiating skills, said Daniel R. Ames, a psychologist who teaches at Columbia University’s business school and who spoke last month at a university-sponsored symposium, “The Science of Diversity.” Dr. Ames said that when he asks people what worries them about navigating the workplace, men and women give the same answer: How hard should I push? How aggressive should I be? Too little seems ineffective, but too much comes across as brash or unpleasant.

Answering the aggressiveness question correctly can be a key to obtaining the financial resources (like laboratory space or stipends for graduate students) and the social capital (like collaboration and sharing) that are essential for success in science, he said. But, he told his mostly female audience, “the band of acceptable behavior for women is narrower than it is for men.”

Women who assert themselves “may be derogated,” he said, and, possibly as a result, women are less likely to recognize negotiating opportunities, and may be apprehensive about negotiating for resources when opportunities arise. That is a problem, he said, because even small differences in resources can “accumulate over a career to lead to significant differences in outcomes.”

For example, as the National Academy of Sciences noted in its report, women who are scientists publish somewhat less over all than their male colleagues — but if surveys control for the amount of support researchers receive, women publish as often as men, the report said.

Another speaker at the Columbia conference, Madeline Heilman, a psychologist at [New York University](#),

said clear and explicit evaluation criteria are essential.

Even today, Dr. Heilman said, the idea that women are somehow unsuited to science is widespread and tenacious. Because people judge others in terms of these unconscious prejudices, she said, the same behavior that would suggest a man is collaborative, judicious or flexible would mark a woman as needy, timid or flighty.

And because science is still widely viewed as “a male arena,” she said, a woman who succeeds may be viewed as “selfish, manipulative, bitter, untrustworthy, conniving and cold.”

“Women in science are in a double bind,” Dr. Heilman said. “When not clearly successful, they are presumed to be incompetent. When they are successful, they are not liked.”

Women do better, she said, in environments where they are judged on grants obtained, prizes won, findings cited by other experts, or other explicit criteria, rather than on whether they are, say, “cutting edge.” “There has to be very little room for ambiguity,” Dr. Heilman said. “Otherwise, expectations swoop in to fill the vacuum.”

The importance of mentors is another theme that runs through these sessions. In her keynote speech at the Rice conference, Deb Niemeier, a professor of civil engineering at the [University of California](#) at Davis, mentioned several occasions when timely intervention from a thesis adviser, department chairman or other mentor turned things around for her.

Joan Steitz, a professor of molecular biophysics at [Yale](#) and a member of the academy’s expert panel, said the same thing in one of the Harvard lectures this month. It is crucial to have “someone up your sleeve who will save you,” Dr. Steitz said.

But there is evidence that women do not receive this support to the degree men do.

Dr. Steitz cited a study of letters of recommendation written for men and women seeking academic appointments. Though all the applicants were successful, she said, and though the letters were written by men and women, the study found that the applicant’s personal life was mentioned six times more often if the letter was about a woman.

Also, Dr. Steitz said, “For women, the things that were talked about more frequently were how well they were trained, what good teachers they were and how well their applications were put together.” When the subject of the letter was male, she said, the big topics were research skills and success in the lab.

“Ever since I read this paper and I sit down to write a letter of recommendation,” Dr. Steitz said, “I think, ‘Oh, have I fallen into this trap?’ ”

If mentors don’t present themselves, women may have to create them, Dr. Steitz said.

She cited “Every Other Thursday: Stories and Strategies from Successful Women Scientists” (Yale

University Press, 2006), a book by Ellen Daniell, a former assistant professor of molecular biology at the University of California, Berkeley. In the book Dr. Daniell describes a group of female scientists who have been meeting regularly for more than 20 years to talk about their professional triumphs and travails, turning themselves into mentors and role models for one other.

As Dr. Niemeier told the women at Rice, “If your adviser is not going to help you with a strong network, form a network of your own. Pick out some women you would like to get to know, who have scholarly reputations, and get to know them.”

Even if their work is brilliant, aspiring scientists must still get through the interview process when applying for a university job. The interview normally lasts a full day and may consist of multiple conversations with faculty members and administrators, a lunch, a dinner and a seminar or colloquium in which the applicant presents her work to an audience that is eager to pick it apart.

At the Rice conference, there was plenty of advice about handling the interview. Some would apply to anyone: shake hands firmly, look people in the eye, have a just-in-case copy of your presentation, and know how to describe your work quickly and clearly to a nonexpert.

But when it came time for questions, a female graduate student in the audience zeroed in on an issue that rarely arises with men: “What should I wear?”

At her university, she said, “The men always come in jeans and the women come in a suit.” But she said she worried that dressing so formally might suggest that she was trying too hard.

Not so, said Rebecca Richards-Kortum, a professor of biomedical engineering at Rice who was an organizer of the conference. She was wearing slacks, a sweater set and pearls —O.K. for traveling, she said, but “a little underdressed” for a presentation.

Remember, Sherry E. Woods told the group, “there is still that thing about even male and female faculty. They are going to judge you by different standards.”

Dr. Woods, an administrator in the College of Engineering at the University of Texas at Austin, reminded the young women of research in which academics were asked to judge the otherwise identical résumés of people who were identified as Ken, Karen or K.

In these studies, she said, Ken consistently comes out on top.

“You are in a male-dominated field,” Dr. Woods said. “You have to present yourself in a way that assures them you know your technical stuff.”

Another young woman raised another question that rarely troubles men. “When I talk about the work in my lab,” she asked, “should I say I or we?”

Dr. Richards-Kortum suggested this formula: “We’ve talked about it in our lab and I think...” She added, “if

you say 'we' too much it can be misinterpreted." And then there was the two-body problem.

In physics, the two-body problem is a matter of calculating the paths of objects in orbit around each other. For women in science, it is a matter of landing a job not just for yourself but for your partner, and then balancing the demands of children and the laboratory.

Here the advice is less clear-cut.

For example, when women at the Rice meeting asked about the best time to tell a prospective boss that a trailing spouse will also need an academic job, they heard answers ranging from "as soon as possible" to "only after you have a firm job offer."

Children add even more complexities.

"I am pregnant and during my interview process I will be visibly pregnant," said Caroline Nam-Laufer, a postdoctoral chemical engineer at the [University of Delaware](#). "I want to put myself forth so that my qualifications come through and not my belly."

Dr. Niemeier, who acquired her own two-body problem recently when she began a relationship with a woman who has two children, suggested responding to questions about children with, "Could you tell me how that factors into your evaluation?" or, "Right now, I am looking for the best job I can get."

"Go into it thinking you are the cream of the crop," she reminded them.

But the speakers had little advice they could offer with confidence that it would fit every woman.

Dr. Richards-Kortum won admiring gasps when she disclosed she is a mother of four who successfully interviewed for a tenured position while visibly pregnant. She faced the process with less trepidation, she said, once she realized "it was O.K. with me if I had kids and didn't get tenure, but it would not be O.K. with me if I got tenure and didn't have kids."

Dr. Niemeier also advised the group to watch for signs that a university might not be ready to embrace successful female scientists. When she was job-hunting, she said, she was advised, "if you are the first woman in the department, walk away. You can have other jobs."

"I don't necessarily agree with that advice," she said. But she didn't necessarily disagree with it either.

Still, many of the women involved in these efforts say things have improved a lot, and continue to get better.

Evelynn Hammonds, a historian of science who heads a Harvard diversity effort started after Dr. Summers's remarks, recalled when, as an aspiring engineer, she was advised that her neat handwriting might mean she would be a good secretary. Instead, she earned a degree in electrical engineering at the [Georgia Institute of Technology](#), a master's in physics at the Massachusetts Institute of Technology and a

doctorate at Harvard.

Among other things, she said, universities should be asking whether a career in science demands 70-hour work weeks “at every point in time,” or whether people should be able to step in and out of academia, as family demands change.

But family issues and other problems affect women beyond academia, she said, and they are more than academic institutions can solve on their own.

At the end of her talk, Dr. Steitz displayed a chart showing rises in the proportion of women in the Massachusetts Institute of Technology faculty. There were few until the passage of civil rights legislation 40 years ago, when the numbers jumped a bit and then leveled off, she said. The numbers jumped again in the late 1990s after a report criticized the institute’s hiring and promotion practices as they related to women.

“We now have another plateau,” Dr. Steitz said, “and it’s my fervent hope that Larry Summers, God bless him, and the report that’s just come out will have this kind of impact.”

Ms. Imoukhuede hopes so, too. She said she was encouraged by the National Academy study — “that it could be done, and that it was taken seriously, that people would be willing to listen to women bringing up these issues.”

Meanwhile, though, she added, “I try to spend less time thinking about these perceptions and more time on my research.”

[Copyright 2006 The New York Times Company](#)

[Privacy Policy](#) | [Search](#) | [Corrections](#) | [RSS](#) | [First Look](#) | [Help](#) | [Contact Us](#) | [Work for Us](#) | [Site Map](#)
