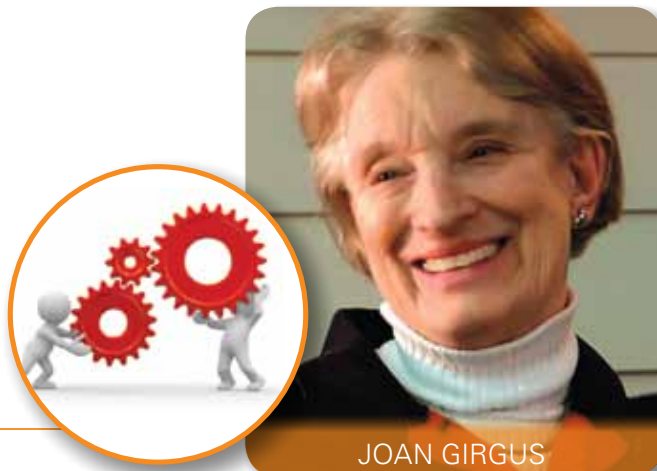


FIX THE SYSTEM, NOT THE WOMEN

REMOVING BARRIERS TO SUCCESS

Despite a wide range of initiatives to support women scientists in their careers, considerable barriers remain, as shown in a recent report by AAAS/L'Oréal. We examine what issues still need addressing in order to break down the remaining hurdles. **By Julie Clayton**



JOAN GIRGUS

Like many graduate students, **Ruth Brown**, wonders what lies ahead. She had to work hard to pay for her undergraduate studies, and now has just one year left at a university in Sheffield until her Ph.D. grant funding runs out and she has to submit her thesis. It may be the start to a long, successful career in scientific research. But still the way ahead seems so full of hurdles that the uncertainty has Ruth considering leaving scientific research altogether.

"The main problem in science is that there's not much job security," she explains. "You have to apply for each contract, and you feel that you are constantly fighting for your own job."

Ruth is especially concerned about the short-term nature of future contracts—a series of postdoctoral positions in different labs, during which she must work to secure a much-coveted, and more long-term, university lectureship (similar to an assistant professorship in the United States). Her career progression would be far from automatic. And Ruth is aware that competition will intensify at each stage. Even if she succeeds through one or more postdoctoral positions, a long-term appointment may still prove elusive.

If Ruth does decide to quit research, she will be one of a huge number of women scientists who have trained to the Ph.D. level and then left academia.

This departure of women from scientific careers is well known in both Europe and North America and is frequently referred to as a "leaky pipeline." The issue was recently highlighted in the 2009 report by the National Research Council on "Gender Differences at Critical Transitions in the Careers of Science, Engineering, and Mathematics Faculty," which showed that despite enormous gains ensuring equal opportunities for women scientists, there remain stark differences between the numbers of men versus women who reach top positions in science (<http://scim.ag/fjXUnq>). Based on two national surveys of research university departments and faculty in the United States in 2004, for example, 45 percent of those earning a Ph.D. in the biological sciences were women, whereas only 26 percent of applicants for tenure-track appointments were female. Is this due to lack of job security, as Ruth fears, or are there other reasons why there are so few women applying for senior level positions?

"Women are making the choice not to apply, but we don't know why. My hunch is a lot has to do with women trying to figure out which setting will allow them to integrate their professional and family lives."

GENDER BIAS

One issue, which received wide attention following a report from MIT in 1999 (*A Study on the Status of Women Faculty in Science at MIT*, <http://scim.ag/e5thdn>), was that too few women were gaining faculty appointments due to gender bias. In other words, hiring panels—which tended to consist mostly of men—were favoring male candidates over female candidates.

However, institutions across the United States have since taken steps to ensure that women are involved in selection and hiring of faculty to protect against women candidates being judged unfairly. It seems to have had the desired effect, in that the 2009 "Gender Differences" report found no evidence of gender bias in faculty hiring, according to **Claude Canizares**, professor in experimental physics at MIT, who co-chaired the report's panel. Indeed, women are very successful at winning faculty positions, so long as they get as far as entering the applicant pool.

Canizares believes that the difficulties facing women scientists are deep-rooted. "It is my personal speculation that academic careers are less attractive to women than men because of family issues, lack of job security, their biological clock, and the time to tenure takes longer now compared to **continued »**

UPCOMING FEATURES

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DIVERSITY: BARRIERS FOR WOMEN SCIENTISTS



“It is my personal speculation that academic careers are less attractive to women than men because of family issues, lack of job security, their biological clock, and the time to tenure takes longer now compared to two decades ago.”

—Claude Canizares

two decades ago,” he explains. “These concerns are different to the issue of gender bias which U.S. universities have worked hard to reduce.”

Joan Girgus, special assistant to the dean of faculty at Princeton University and member of the “Gender Differences” report committee, agrees. She believes “women are making the choice not to apply, but we don’t know why. My hunch is a lot has to do with women trying to figure out which setting will allow them to integrate their professional and family lives.”

The difficulty of balancing life and a scientific career is an issue commonly raised by women researchers who leave academia. The 2010 AAAS/ L’Oréal survey “Barriers for Women Scientists” (<http://scim.ag/hPAAt8n>), in which more than 1,300 men and women across the United States took part, identified the difficulty of having and raising children as a major barrier for women scientists, along with the challenges of finding funding and the experience of gender bias. Other barriers cited included the lack of access to mentors and role models. In regards to overcoming barriers for career progression, women appeared to be more likely to rely on other people, such as friends or family, mentors, and teachers, while men had a tendency to go for less personal resources in the form of grants/fellowships and corporate support.

These findings reflect the situation on both sides of the Atlantic, according to **Rachel Tobbell** at the United Kingdom Resource Center (UKRC), a government-funded body working to promote gender equality in science, technology, engineering, and mathematics by providing advice, tools, and resources. “This [survey] could be about the U.K.—it’s very similar,” she says.

For example, she highlights the dilemma women face during their pre-tenure years—a limited window of time to start a family, given the knowledge that by the age of 42 only a very small percentage of women are able to conceive naturally. “It’s a watershed time. There is a lot of pressure during that part of your life. It’s a time when a lot of young scientists are working in a very insecure environment, competing for short-term contracts and limited grant funding. Women just can’t see how they can do science and have a family. Men are less put off—they do not have the same biological clock pressure. By the time they are at lecturer level men are in the majority.” In

addition, Tobbell notes that men are more willing to work in a competitive environment.

Another problem facing many women is lack of confidence, and hence a reluctance to put themselves forward for a promotion. “Women are more likely to deselect from an application, whereas men are more willing to have a go and risk rejection. Women are more likely to look at a job description and see the parts they do not fulfill,” Tobbell observes.

So what can be done about this myriad of problems facing women in research?

Strategies such as mentoring can make an enormous difference. With help and advice from UKRC, the United Kingdom’s Biochemical Society has established a mentoring program for women biochemists, pairing together experienced senior women scientists with more junior women at other institutions, in order to provide encouragement, advice, and practical help. Ruth Brown is one of the first groups of mentees who began a yearlong effort with a mentor at the University of Leeds. It is this program that has kept Ruth on track to complete her Ph.D. “I got to the point where I wasn’t sure I wanted to continue. It was the mentoring program which made me want to carry on,” she says.

Ruth also looks upon her mentor as a role model: “If you see someone senior and they’re willing to talk to you then you believe you can get there,” she adds. Ruth’s mentor encouraged her to apply for travel funds to attend a conference, and to network. The reward for Ruth is increased confidence—so much so that she has volunteered to represent students and chair meetings for her department’s Postgraduate Staff-Student Committee—something that she would not have considered before.

INSTITUTIONAL STRATEGIES

For the past 10 years, the U.S. National Science Foundation’s ADVANCE program has supported universities across the United States by providing a broad portfolio of activities that support women scientists, including mentoring.

Other institutions have their own programs. At Princeton, for example, faculty and staff who have children are eligible for up

FEATURED PARTICIPANTS

Biochemical Society (United Kingdom)
www.biochemistry.org

GenSET
www.genderinscience.org

MIT
www.mit.edu

National Research Council
www.nationalacademies.org/nrc/

National Science Foundation (United States)
www.nsf.gov

Princeton University
www.princeton.edu

Royal Society
www.royalsociety.org

United Kingdom Resource Center
www.theukrc.org

University of Amsterdam
www.english.uva.nl/start.cfm

University of Leeds
www.leeds.ac.uk

University of Oxford
www.ox.ac.uk

University of Tromsø
www2.uit.no/www/inenglish



“The European Commission thinks GenSET is great because it’s a new voice from the scientific community for the scientific community.”

—Elizabeth Pollitzer

to \$5,000 per year for pre-school childcare support and maternity leave. Faculty can apply for travel support to conferences for dependents, and new faculty who are the primary parent responsible for childcare can have time off from teaching. Graduate students have parallel programs. And to encourage more women to apply for faculty positions, Princeton also has a policy extending tenure-track positions by an extra year following the birth or adoption of a child—an approach now popular with other universities across the United States. This enables scientists to produce more publications than they might otherwise have achieved after taking time out with young dependents before being assessed for permanent appointments. Girgus, who has overseen this transition to a more family-friendly environment, believes that Princeton is now more attractive to women scientists. Being a female professor now “feels more like part of the norm,” she says.

Such initiatives, however, are aimed mostly at the two ends of the academic ladder—graduate students and faculty—so there is still a large group of women in between who are not receiving such targeted support. According to Girgus, it is the women postdoctoral researchers who are least addressed by current policies and practices. “It’s the postdocs who miss out. Although some universities do have administrators to address the needs of postdocs, the short-term nature of their employment and relatively little structure for central university support makes it harder to create career programs aimed at postdocs,” Girgus points out.

In the United Kingdom, universities are encouraged to create female-friendly policies by the Royal Society’s Swan Charter Awards. A university can apply for a Bronze Award by creating a plan for changes that support women scientists, a Silver Award for implementing these plans, and a Gold Award for producing evidence that the changes are having an impact.

Other parts of Europe, however, are lagging behind. In the Netherlands, there are very few women in senior scientific positions and attitudes among male-dominated establishments are slow to change, according to **Simone Buitendijk**, professor in Women’s Health and Midwifery Studies at the University of Amsterdam Medical Center.

“It’s such a pervasive part of our society that women don’t play the role that men do in industry or in government. We’re

making very slow progress.” What’s missing, she believes, is awareness of the importance of gender diversity—not just for achieving equality for women, but the understanding that gender diversity brings much wider benefits, such as different approaches to problem solving and to decision making which can make teams, departments, and companies more successful in a competitive marketplace. A greater awareness about gender diversity would, she argues, provide a stronger incentive for institutions to change.

Buitendijk is one of a panel of scientific experts who recently took part in GenSET, a project that aims to introduce change at scientific institutions across Europe so as to achieve a balanced representation of women in all areas. Key to the GenSET philosophy is that gender equality in science improves scientific quality. It is not just a women’s career issue but a societal issue, and that through gender diversity, the entire workforce has the potential to be more creative and productive. The European Union supports the project as part of a broader Science in Society program that aims to enhance the success of Europe’s scientific workforce.

“The European Commission thinks GenSET is great because it’s a new voice from the scientific community for the scientific community,” notes leader of the GenSET consortium, **Elizabeth Pollitzer**.

Over 100 European institutions have become partners to GenSET, including the London School of Economics, the Spanish National Research Council, and the European Science Foundation. Another is the University of Tromsø, Norway, which has become the first institution to fully adopt GenSET’s guiding principles, coordinated by **Curt Rice**, pro rector of the university and a theoretical linguist who also specializes in scientific leadership. Each of the university’s six participating faculty will be translating these principles into action, and will receive mentoring by GenSET during the process.

Getting commitment for change at the highest ranks is critical, according to Buitendijk. “We need deans and CEOs to understand the issues and then persuade those below them.”

However, for institution leaders to be convinced to take action on gender diversity they may first need convincing about the personal benefits of such action, according to **Nicole Grobert** at the University of Oxford, who coordinates the U.K. arm of a European-wide project known as Diversity. “The personal benefit is a key to the initiative,” says Grobert. She emphasizes too that these changes do not require massive resources. “It’s about a change of mindset and not creating additional workloads for people.”

Graduate student Ruth Brown has yet to make her final decision about whether or not to stay in academic science. If she does decide to leave the lab, she feels well equipped for a career in a different area of the science enterprise. One area she is considering is management consulting where she can apply the skills she has learned in analytical thinking, data presentation, and writing. So even if her decision is a loss to research, she still has the potential to make an important contribution to the broader scientific arena.

Julie Clayton, a freelance science writer and journalist, works out of Bristol, United Kingdom.

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