

# SCIENCE

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# LETTERS

## Women in Science: The Response

*Science* would like to thank all those who responded to the “Women in Science” section (13 Mar., pp. 1363–1388) by writing or returning the poll at the end of the section. We have received more than 500 responses—the overwhelming majority positive—and almost all saying the section should become an annual feature of *Science*. Even the criticisms were constructive; most of them identified topics that should be covered in future efforts. One repeated theme was the lack of coverage of female researchers in industry, a topic that will certainly be addressed in future issues. Many people who wrote asked for more descriptions of solutions to problems faced by women in science, another subject that will definitely be treated in the future. A number of writers pointed out the absence of minority women; that lack will be redressed both in future articles on women in science and in a special section on “Minorities in Science” to be published later this year. The subtlest and most interesting criticism was that the section reflected a model of success—tenured professorships at major research universities—that may be assumed by *Science* but is by no means the only possible version of the successful scientific life. The point is well taken. And last, both readers who did think the section should be an annual feature and those few who didn’t argued that there should be more coverage of women’s issues in science on a regular basis in the magazine. We’re listening.

Since we can’t possibly answer or publish all the letters we’ve received, we’ve decided to do the next best thing and offer a sampling of the responses. Here they are.

**John Benditt**, Editor, “Women in Science”

As I read your issue on “Women in Science” with great interest, I paused briefly to push my chair away from my desk and take a survey of my university office and my intertwined life. My lecture notes for my upcoming freshman chemistry lecture course are somewhere buried under the pile of National Science Foundation proposals I am reviewing. Also under there is a pacifier for my 5-month-old son Bryan that I inadvertently tossed when I brought him to work with me this morning, as I do every morning. He spends his day in the university-sanctioned “Science Complex Baby Room,” which is located downstairs from my office. Another corner of my desk contains a pile of transparencies I used for my departmental seminar yesterday and an assortment of capped and uncapped transparency pens. My file-cabinet drawer remains open with recently inserted reprints and conveniently also serves as a towel rack for a damp baby blanket. My answering machine has five unanswered messages on it from this morning alone. One is most likely from the *Journal of Physical Chemistry* reminding me to review the paper they sent me last week, and at least one other is from my baby’s caregiver reminding me to bring some extra diapers the next time I come downstairs to feed Bryan.

If any of my graduate students or post-docs come in to chat today, they are going to have to choose between sitting in the

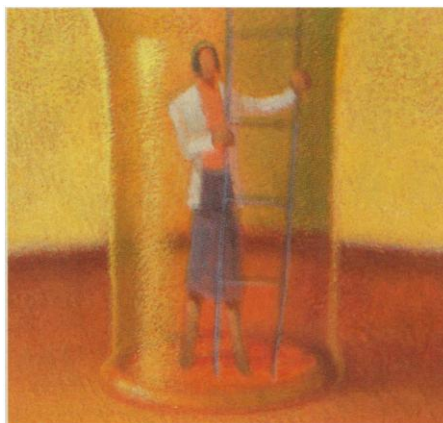
chair that is stacked with books I checked out of the library this morning and the second chair, which holds a multicolored musical dinosaur and teething rings. My office contains a myriad of smells emanating from such sources as a beaker of eggs soaking in vinegar, which I am using for my upcoming lecture demonstration on osmosis, an open container of glue that I have been using to throw together a poster for an upcoming meeting, a diaper bag, and a burp-up rag, which is always kept in arms reach in case the baby comes up for a visit. My bulletin board contains numerous Post-it notes with phone numbers for persons I no longer recognize, a picture of my 2-year-old son Dustin and his physicist father Steve playing with an oscilloscope, a seminar schedule for some unknown term and year, and postcards that remind me of the “good old days” when the most difficult part of traveling to meetings was finding good restaurants.

Other than the fact that the state of the office suggests I am not getting all of my work done in the most organized manner, I take a moment of delight in feeling that I’ve got this picture right. It was gratifying to see that there are other members of the scientific community who would agree with this.

**Geraldine Richmond**  
Department of Chemistry,  
University of Oregon,  
Eugene, OR 97403-1253

I was pleased that *Science* devoted a section to "Women in Science," but disappointed in the article "Key issue: Two-career science marriage" (p. 1380) because it did not paint a realistic picture and may actually discourage young women. Unlike Ellen Williams, most of us do not have the option of live-in grandparents, and most of us do not have the fortitude to work 16- to 20-hour days, 7 days a week, as described by Deborah Spector. There isn't enough time in such a schedule to take care of yourself, let alone children. I am particularly sensitive to this issue because I work part time. After several postdoctoral positions, I began working 30 hours a week as a research microbiologist at the Environmental Protection Agency's (EPA's) Health Effects Research Laboratory 14 years ago when I had one baby and my husband was an assistant professor in the Math Department at North Carolina State University. I am now Chief of the Immunotoxicology Branch at EPA, usually work 35 to 40 hours a week, and have four children. My husband is a full professor. I would like young women to know that you do not have to be superhuman to have a successful two-career science marriage, and I would like more young women to be given the opportunities I had.

I have actually had men say to me, "I don't see how you can be a good scientist working only 30 hours a week." As long as



the myth is perpetuated that one cannot be a good part-time scientist, the number of women who choose science as a field will remain low. I was lucky to have supervisors who defended to upper management their decisions to promote me on the basis of my capabilities and accomplishments despite my part-time status. What is needed to draw more women into science and keep them there are more opportunities to work part time or to take time off without being severely penalized.

MaryJane K. Selgrade

U.S. Environmental Protection Agency,  
Research Triangle Park, NC 27711

As a female postdoc and aspirant faculty member, the message I got from the "Women in Science" issue was that succeeding in science is really, really hard and that it never gets easier. In view of the well-recognized and specifically stated fact that success in this field is correlated with self-confidence and persistence, I'm not sure these articles are the best thing *Science* could have done for women. I have never been under the misimpression that anything having to do with a career in science was going to be other than difficult by all normal job standards. But I'm still here. Your articles gave an extremely discouraging and depressing picture of the situation. The apparent superhuman strength and tremendous personal sacrifice on the part of the women you profiled did nothing to dispel the impression of hopelessness for the rest of us mere mortals. The most successful postdocs I know (in the objective terms of acquiring funding and doing publishable research) are women. I see no hesitation on the part of the principal investigators around here, old-boys or otherwise, to make thorough use of this talent. It is obvious to me that any department or institution that chooses to be squeamish about hiring and tenuring women cannot remain competitive and will eventually cease to be anyone's problem. I strongly

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encourage you to present, in the future, a more balanced picture of what a career in science is like. It's a great way to make a living for women as well as men.

**Melanie MacNicol**  
Department of Pharmacology,  
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I hope the "Women in Science" section becomes an annual feature of *Science*. One topic that was not covered has to do with the filling of senior academic positions at universities and colleges. Most institutions claim to be "affirmative action/equal opportunity employers" and have affirmative action officers who ensure that women and minorities are interviewed for available positions. However, obtaining an interview is one thing, actually receiving an offer is another. Universities seem to exert very little control over the process by which the final candidates for offers are actually selected once potential candidates have been interviewed. It is my impression that when highly successful women are among the candidates for senior positions, job offers frequently go to less qualified (and less threatening) candidates and that the process whereby this happens is subtle, discriminatory, and counterproductive to the best intentions of the institutions involved.

This subject deserves study and I hope *Science* will look into it in the future.

**Dean Falk**  
Department of Anthropology,  
State University of New York,  
Albany, NY 12222

*Science's* 13 March issue on "Women in Science" has stimulated much constructive discussion. While the upbeat anecdotes by several of today's leading women chemists are most encouraging to young women contemplating chemistry careers, it appears that some roadblocks remain. For example, while women earn close to 40% of chemistry B.S. degrees, their proportion in the chemistry work force is lower at higher levels—25% of Ph.D.'s, 12% of college faculty, and under 7% of doctoral faculty. Women scientists are poorly represented in many national policy-making groups. This may be partly explained by the time it takes for today's young women chemists to work their way to the top, but it also suggests that the road to success and full participation still contains rocks and potholes. Some of these impediments—slower advancement to management, lower salary within an age cohort, family-career conflicts, and harassment—are documented in a recent *Workforce Report* (April 1992) of the American Chemical Society. Within chemistry, it is

only recently that women have achieved parity in the research grant pool and strong representation on review panels. It is my personal opinion that to "declare victory" now would be premature. As husband of a chemist and father of an aspiring woman scientist, I interpret current evidence to suggest that the modest programs that exist to stimulate professional advancement by women in chemistry are still needed.

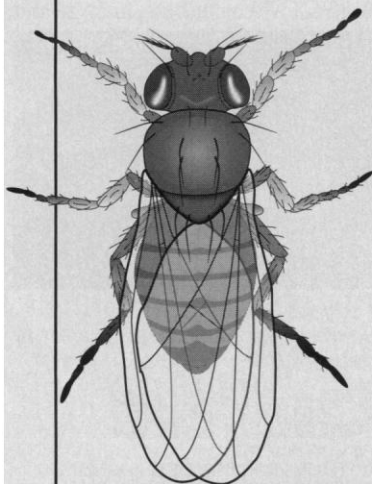
**Kenneth G. Hancock**  
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I applaud the recent special section on "Women in Science." The dearth of women in tenured positions is certainly an issue worthy of scrutiny, and discrimination in academia, subtle or otherwise, should be exposed. But to focus so heavily on women in academia gives a narrow perspective. The statistics that demonstrate decreasing proportions of women with increasing academic level seem to imply that the women with Ph.D.'s in the sciences who are not moving up the university ladder are either stuck at the bottom or have fallen off the face of the earth. Some of us have pursued careers in industry, where opportunities for interesting research and career advance-

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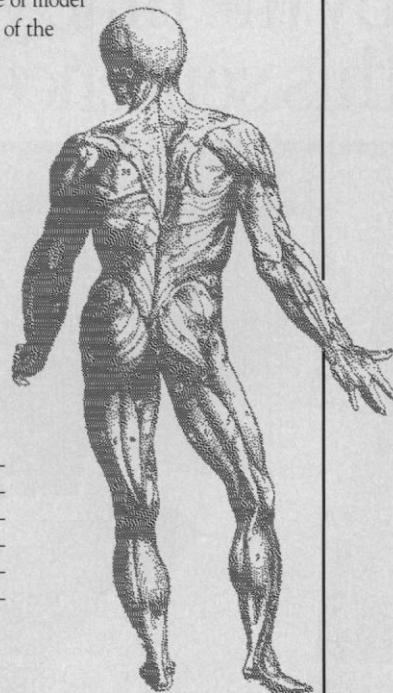
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ment exist. In my view, industry employers are more likely to respect the importance of family life to female and male scientists than are their university counterparts. Young women entering the sciences need mentors and role models in the university but also information about the range of career paths available to them.

**Julie A. Olson**  
Assistant Director,  
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When I was in graduate school, some of the male graduate students tried to harass and embarrass those of us women who dared to challenge them. Well, we didn't back off, and I think for the most part they (albeit grudgingly) learned to respect us. So when I came into industry, I was ready to put up with a bit of resistance. Unfortunately, it's more than "a bit," and it is getting tiring to keep up the fight. It is somewhat discouraging for those of us just starting out to see that, even though it may not be as obvious as it once was, sexism in science is still alive and kicking! Keep up our hopes and raise consciousness by continuing to print special features like "Women in Science."

**Michele Jetter**  
DuPont Merck Pharmaceuticals  
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We commend *Science* for devoting a portion of the 13 March issue to "Women in Science." The articles succeeded in effectively presenting a thoughtful and insightful discussion of the many challenges that continue to be faced by women scientists today.

Your readers may be interested to learn that the Association for Women in Science (AWIS) is actively engaged in an innovative nationwide mentoring program supported by a 3-year, \$400,000 grant from the Alfred P. Sloan Foundation. The first-of-its-kind effort is taking place through a variety of individual and group programs administered through AWIS regional chapters. Women in search of mentors or who wish to become mentors themselves can obtain additional information by contacting AWIS at 800-866-AWIS.

We, and the thousands of women scientists who make up the membership of AWIS, look forward to next year's "Women in Science" survey in *Science*.

**Ellen C. Weaver**  
President,  
Association for Women in Science,  
1522 K Street, NW, Suite 820,  
Washington, DC 20005

**Stephanie J. Bird**  
Past-President and  
Mentoring Coordinator,  
Association for Women in Science

The issues raised in the "Women in Science" special section were of critical importance not only to women but to all those who value the contributions of science to society. There was, however, an underlying assumption in the articles that I find pervasive and disturbing: women are not considered to be successful scientists unless they have tenure-track, tenured, or equivalent positions. This is a discriminatory, sexist, and serious misapprehension, with damaging implications for science. There is no question that a larger proportion of women than men who have Ph.D. degrees are in part-time or "soft-money" positions. For example, in a survey I did in 1990 at Duke University, I found that among those who had earned their Ph.D. degrees in botany there from 1979 to 1989, 20% of the women, but only 5% of the men, were in part-time or soft-money positions.

The reasons for this are myriad, including taking time for raising a family and having difficulty locating a position near where a husband works. Many in these marginal positions continue to be active scientists publishing in major journals and, when they

have the appropriate institutional support, acquiring grants for their research. Whatever their records, they are regarded as second-class scientists, merely because of their lack of institutional rank. I find this situation to be distressing on several counts. First, there is a tremendous waste of scientific talent when women (or others) in such positions are faced with major hurdles to funding their research or planning for the future. Second, regardless of the quality of their research it is difficult for them to gain the respect that they deserve for their scientific accomplishments, which leads many to give up in frustration.

I do not have the solution to this problem, but society needs to address it. Numerous studies have documented that women in science lose self-esteem in graduate school. When this experience is followed by the loss of self-esteem brought about by a marginalized position, the effect can be devastating. The problem should be seriously considered by both the universities and the academic community. There needs to be some way for these scientists to be recognized as full partners in the scientific establishment.

**Emily W. B. Russell**  
Department of Geological Sciences,  
Rutgers University,  
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The positive coverage and commendable support of the "Women in Science" special section is contradicted by the gender imbalance of the *Science* Editorial Board and Board of Reviewing Editors (p. 1329). This imbalance cannot be reconciled with the cover caption on the same page, which describes the "glass ceiling" faced by female scientists.

While the scientific qualifications of those who review the papers submitted to *Science* must not be softened to achieve a more balanced representation of gender, surely there are some scientists within the AAAS who happen to be both qualified and female. A search for these talented women could be initiated in time for them to be introduced in your second annual report on "Women in Science."

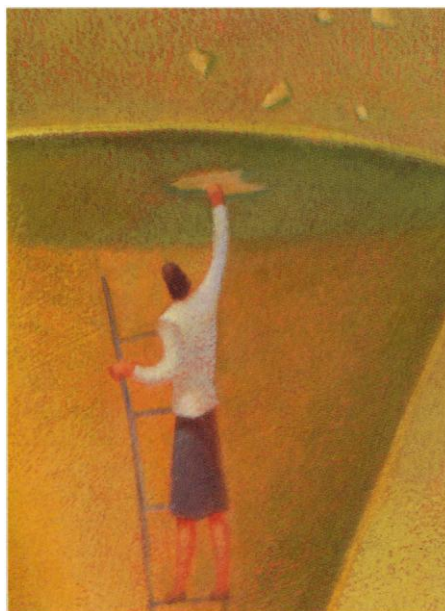
**Forrest M. Mims III**  
Editor, *Science Probe*,  
433 Twin Oak Road,  
Seguin, TX 78155

I read with great interest the editorial and articles in the "Women in Science" special issue. What caught my eye is that all 23 women professors and academicians described in the issue are white. If Abbott Laboratories had not put an advertisement in this issue, there would have been no minority women scientists mentioned at all. Yes, there are probably more minority women who work in industry than in academia. But what is the percentage of minority women among women in science in general? Moreover, is the percentage of minority women among women professors below 5%? I am currently teaching an upper-division undergraduate biology course; 30% of my students are minority women. I am the only minority woman professor in my college.

White men have a life-long experience of interacting with white women as their spouses, sisters, or daughters. For them it may not be as difficult to socialize with white women as with minority women. Furthermore, the stereotypical image of minority women may make it hard for most to accept them as their superior. The expression "women and minorities" usually means white women and minority men. Women minorities in science face an obstacle far greater than that of white women and minority men combined.

**Renee Sung**  
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From my own experience, I find that relief from some of the teaching-administrative duties is crucial to the woman scientist's ability to carry out her research activities while raising small children. I propose that the equivalent of the National Institutes of



Health "Career Development Awards" be made available to mothers of young children. The award would basically pay their salaries, or that portion thereof that is needed to secure replacement teaching. The woman scientist could still teach an occasional graduate course in her specialty, so the department might even benefit from the arrangement. This arrangement would give her the flexibility that is so needed with small children, while still maintaining the continuity and productivity of her research.

Today, many mother scientists opt for research faculty "soft-money" positions. Unfortunately, the scientific community is rather conservative, and it is extremely difficult to transfer from a "soft-money" to a tenure-track position once the children are grown. However, if a vehicle for providing relief from teaching while mothers are in regular faculty positions existed, they could continue to hold on to their tenure-track positions. This solution would be preferable to an extended tenure period, as it would allow the woman to maintain high productivity and therefore remain funded.

**Hanna Reisler**  
Department of Chemistry,  
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From our perspectives as tenured scientists in the life sciences, it is clear to us that disparities of opportunity exist for women even after "success" has been achieved. From discussions with female colleagues, we find that most agree that women tend to have lower visibility compared to male colleagues with similar achievements. The surest way to gain visibility is to be an invited speaker at meetings and departmental sem-

inars. Yet, it is amazing how easy it is to find meetings, even in fields in which there are many prominent women, that have a very small number of women speakers. As one way to both highlight and improve this situation, we suggest that the National Institutes of Health, the National Science Foundation, and private foundations consider the representation of women as one criterion for funding a meeting.

**Denise Galloway**  
**Maxine Linial**  
**Virginia Zakian**  
Fred Hutchinson Cancer Research Center,  
1124 Columbia Street,  
Seattle, WA 98104-2092

I find it ironic that the special section in *Science* discussing some of the barriers to women in science was preceded by an issue (6 March 1992) trumpeting the Gordon Research Conference. A not-so-invisible barrier to women exists at the Gordon Research Conferences, namely, the fact that "children under 12 years of age are not permitted in the meeting rooms, dining rooms, or dormitories at any host sites." This policy, while not overtly discriminatory, undoubtedly affects many more female than male scientists. The Gordon conferences would more truly represent the "frontiers of science" by not only permitting children but offering childcare at the meetings. It would also be encouraging if the interest of *Science* in barriers to women scientists was not confined to a single special section, but was evident every week.

**Linda Vigilant**  
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We commend *Science* and her editors and staff for continuing to address issues affecting women in science. As chemists, we appreciate the strong positive comments made by Mary Good and Jacqueline Barton (p. 1372) concerning the opportunities for success on which each has capitalized during her career in chemistry. Would that their stories represented the macrocosm rather than a microcosm. Many women scientists—competent and hard-working—continue to fare not so well. We look forward to the time when this reminder need not be made and that "women" as a qualifier need not be used.

**Debra R. Rolison\***  
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I take strong exception to Jacqueline Barton's comment, quoted in the "Women in Science" special section (p. 1372), that, for women, "There are no obstacles if you work hard." This can only be wishful thinking.

Even under the best circumstances, most young female chemists begin their academic careers in predominantly male departments with few female role models and few male colleagues who feel comfortable as their mentors. Those women brave enough to choose parenthood find that most universities provide decidedly inadequate infant-care facilities and that their time is entirely consumed with teaching, research, and child care. Increasing isolation from their colleagues is the inevitable result. Moreover, many find that their status has changed in the eyes of their colleagues if they have babies: they are considered less committed to their careers.

It is my impression that the experiences of female academic chemists may be divided into two categories. The success stories come mainly from women who started as assistant professors in supportive departments where they felt valued by their colleagues, even when they had babies. The horror stories come from women whose very promising careers were damaged or derailed by a department whose work environment was hostile to young women (and not infrequently also to young men). This atmosphere either destroyed their self-esteem or so exhausted them that they gave up and went elsewhere.

On the basis of my experiences and those of my female chemist friends, here is some practical advice which reflects the real situation for women chemists at the start of their academic careers:

1) When you apply for a position and during the interview process, avoid asking questions related to "women's issues." If you are labeled a feminist at this stage, it may diminish the seriousness with which you are evaluated.

2) After you have been offered a position (in writing) and before you accept it, you are in a very advantageous position to ask questions about the history of women in

the department, relative salary levels, parental leave policies, and availability of nearby child care. Find out what life will be like if you have children: Will you be able to carry a reduced teaching load for a while? Will you be able to find affordable child care close enough to allow you to nurse your infant during the day?

3) As a part of your negotiations with the chair of the department for funds for your laboratory, salary, and so forth, ask for a guarantee of places for your children in the available child-care facilities and a housing allowance to permit you to live as close to your laboratory as possible. These assurances are important even if you are not married or uncertain whether or not you will have children. (Male candidates should also take heed.)

4) If you have a choice of offers, accept the one that offers the best environment for both your professional and personal growth. Choose a department with a spirit of collegiality. Shun departments with a record of hostility to women (and to assistant professors in general), no matter how high those departments may stand in national rankings.

**Joan Selverstone Valentine**

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I would like to offer the following clarification of my reasons for taking leave from Princeton University, as discussed in Paul Selvin's article of 13 March (p. 1382) about women in mathematics.

The serious obstacles to the full participation of women in science are too complex to be addressed completely in one magazine article. Likewise, the experiences and opinions of individual women mathematicians can very easily be misrepresented or misinterpreted. I hope some readers will reconsider at least the first paragraph of Selvin's article in light of the following information.

The primary reason I took leave from my position as an assistant professor at Princeton University is that Princeton's mathematics department rarely tenures its junior faculty. In fact, the chair encourages those in their second 3-year term to consider themselves on the job market. Last year I heeded this thoughtful advice and applied to four institutions where I felt my research program would continue to flourish. At Haverford College I have the opportunity to collaborate with one of the leading researchers in my specialty. The teaching environment here is also stimulating, due to excellent students and a dedicated faculty. Haverford is simply a wonderful place for me. I enjoy serving on its faculty as much as I love mathematics research.

Attracted by Haverford, I requested leave from Princeton. The dean of the faculty and chair of the mathematics department at Princeton, with characteristic understanding and generosity, granted my request. Like many senior faculty at fine research universities, they try to keep the best interests of junior faculty uppermost in their minds.

I wish only that those few readers who have reacted to Selvin's article by criticizing the profession of mathematics or Princeton's department of mathematics would focus instead on removing barriers to the full participation of women in their own fields and at their own institutions.

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Apparently "almost every female chemist" interviewed believed that "affirmative action" means hiring "weaker women" (p. 1373). This simply accepts the fallacy that women are not as good scientists as men. Affirmative action—making extra efforts to train, hire, and support women scientists—is necessary precisely because such prejudice is rampant.

The women mathematicians express a more correct understanding of the situation in regard to "affirmative action" (p. 1383). As Lynne Butler describes it, it "loosens restrictions" (which are usually defined by the men in the old-boy network) and opens the door to women. Women in the field are often better than the men, but at present are not being hired, which shows how little action there has been in "affirmative action."

Why should hiring women mean hiring weaker scientists? It doesn't, unless you believe that women can't do things as well as men. That fallacy we women, who so often see discrimination justified because we are "weaker," must refuse to accept.

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### Corrections and Clarifications

In the 13 March special section "Women in Science" a caption accompanying a chart on page 1382 accompanying the article by Paul Selvin about women in mathematics was incorrect. The data did not show how male and female mathematicians evaluated mathematics articles. In fact, the articles in the study that was discussed [M. A. Palerdi and W. D. Bauer, *Sex Roles* 9, 387 (1983)] were about politics, the psychology of women, or education; the subjects were not mathematicians but male and female college students. *Science* regrets the error.