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LETTERS

Women in Science '93: A "Female Style"?

Thank you for the 16 April special section "Women in Science '93" (p. 383). I was fascinated and encouraged by every article. Please keep up the good work! I was amazed and comforted to read that my lack of competitiveness, my interest in my research for its own sake rather than for advancement, and my feeling that the quality of published work far outweighs the importance of quantity do not make me an inadequate scientist, but rather a fairly typical woman who has just been promoted to Research Associate Professor.

My research interests in avian immunology and infectious diseases within the veterinary medical community limit my opportunity for professional female contact. I tend toward collaborations with other women (although my choices are few) because in these situations, the work and credit loads are equitably divided and I can enjoy the heady experience of working together toward a goal—something I have experienced only in fits and starts with male collaborators. In collaborations with men, there seems to be a constant emphasis on power structure: how much work I will do versus what he does, how much money I will spend versus what he spends, who will be first author on publications, and so forth. These things just seem to flow between women so that science can be the focus of the endeavor.

I'm not sure the culture can be forced to change. More women and empathetic men must bring about the changes by having the courage to live them. Now that I have walked through the promotion fire and come out alive, I am more determined than ever to succeed without power-playing and fierce competitions. I am hopeful that I will be able to influence a refocusing of the scientific community back to science for its own sake through my own example and through active mentoring of other scientists, male and female.

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Science is to be complimented for "Women in Science '93." Insufficiently addressed, however, is the fact that the "playing field" of science will never be leveled if child care and family continue to be seen as exclusively a woman's—not a man's—concern. Solutions offered to the "supermom" syndrome—part-time work, adjusting the tenure clock, not having children—too often refer exclusively to mothers. While it is crucial that institutions create alternatives for women who choose to devote more time to child bearing and rearing, alternatives should also be created for men who want to spend more time fathering. We need to know more about how men are scaling back to accommodate family life. In the same way that science might have something to gain from the increased presence of women (as the articles suggest), so too might children benefit from more actively engaged fathers.

The notion that women might bring a different style to science derives largely from the fact that women still bear primary responsibility for children's health and well being. It is important to recognize that parenting and science share an intimate history in that mothering and science were long construed to be in opposition to one another. In the late 17th and 18th centuries, for example, a woman who bore a child often did not raise that child. It was an open question whether women would become actors equal to men in public and professional life. In the ensuing struggle, women did not get civic rights but became newly empowered mothers within the home. Separate spheres—public and private—developed for men and women, each with its own ethos and appropriate behaviors. Women, in the sphere of hearth and home, were to be caring mothers, cooperative companions, and resolvers of conflict. Science, in the public realm, came to be seen as aligned with traits defined by the culture as masculine (*1*).

Given this history, it's not surprising that we still have problems integrating women into science. Women have no special claim to styles labeled "female" or "feminine," and emphasizing differences between men and women runs the risk of perpetuating such divisions. Yet gender dif-

ferences must continue to be analyzed because women as a group have been, and continue to be, disproportionately absent from science, and more needs to be done.

One final note: Daniel E. Koshland, Jr.'s editorial "Women in science" (16 Apr., p. 275) suggests that it was only women *novelists* who took on male pseudonyms. Women *scientists* are also known to have adopted this practice. Sophie Germain, the prominent 18th-century mathematician, for example, assumed the name Antoine-August LeBlanc in order to attend the Ecole Polytechnique in Paris at a time when universities were still closed to women. In the 1840s, Elizabeth Blackwell, the first woman to attend medical school in the United States, was advised by professors of medicine to attend classes disguised as a man.

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References

1. L. Schiebinger, *The Mind Has No Sex? Women in the Origins of Modern Science* (Harvard Univ. Press, Cambridge, MA, 1989); *Nature's Body: Gender in the Making of Modern Science* (Beacon, Boston, MA, 1993).

We all know what an uphill battle women face trying to build serious careers in science. The visibility and support *Science* has provided in its special section "Women in Science '93" is a great help. The general tone of the articles, however, suggests that the problem of providing for children is

owned by women. Although in some examples it is stated that fathers contribute half the child care, it is clear that the overall responsibility, and the majority of sacrifices, still belong to the women. Until everyone accepts that child care is *not* a problem that belongs to women, women will not be treated fairly either at home or in the workplace. A woman who becomes a part-time scientist has no career future. She has caved in under the burden. Other success stories feature women who have created alternative careers, who have, in other words made silk purses from the sows' ears they were given. Are these truly success stories, when women have had to leave the system of mainstream science in which men are succeeding? These women demonstrate great creativity, drive, and resourcefulness, beyond what is required of men, but why did they have to go outside the system?

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Concerning one of the issues raised in the excellent discussions last year and this on women in science—the conflict between simultaneously having children and furthering one's research career—I find that I have five female postdoctoral fellows with small children (one with two). Clearly there are many examples of women who have successful careers in research while simultaneously raising a family, and we have two female faculty members at the Whitehead Institute with small children. But no one with whom I have spoken has ever heard of one laboratory with as many female scientists with children.

My purpose in writing is not to boast: I have no idea why so many women with children come to my laboratory or have children once they are here. Rather, it is to point out that it is possible for a woman to do pathbreaking research at a top research institute and still have a family life. This is not necessarily easy, as all have had to juggle complex schedules and elaborate child-care arrangements; and all have supportive husbands who share in these responsibilities. However, all are able to work efficiently and productively.

The Whitehead Institute currently is ranked first by the Science Citation Index in terms of the impact of our publications and the frequency with which they are cited. It is important to emphasize that much of this work is done by female graduate students, postdoctoral fellows, and faculty with small children.

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Most scientists (male or female) do not win prestigious prizes or do ground-breaking work. Most of us do some productive research and are primarily employed in teaching colleges. I am all in favor of presenting role models for younger women to emulate. Young women who are going for the Ph.D. should be aware, however, that a very satisfactory career choice is what I call the mid-level tract. Too often discouragement comes from "trying to do it all," and then ending up doing nothing.

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I was especially encouraged by the examples given in "Women in Science '93" of successful women scientists with several children. It seems to me that wanting to have children and wanting them to have the best possible care under the circumstances is a perfectly legitimate human desire for both men and women, even in a "macho" profession such as science. Furthermore, I would like to think that, of the various groups of working parents, scientists would be among the best qualified to objectively discuss current and future studies of child care and development. I realize that child care is not and should not be only a woman's problem, but since many of us, for whatever irrational reason, find ourselves distracted by a big chunk of this responsibility, it seems appropriate that women scientists discuss it.

On a different topic, we should realize that the issues of race and gender are intertwined. To speak of a "female" style of management without realizing that Asian men might have a less direct, more "feminine" style of leadership than, say, Australian women (or whomever, I'm just guessing) is to miss a whole level of complexity. As an Asian-American, I've found that the generalization "girls can't do math" is balanced quite nicely by "Asians are all math brains," and my presumed poor verbal skills as the child of immigrants are countered by a feminine genius with words. It appears that many of our presuppositions are interrelated.

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As I read the many articles in the special section "Women in Science '93," I could not help but recall the feelings of distaste and queasiness I felt a couple of years ago when reading in another issue of *Science* a news article written with clear relish and excitement over the competition between two labs in molecular biology. OK, so we're mature enough to recognize our motivations and label them correctly, but shouldn't we at least feel a little embarrassed to glory in such juvenile (or glandular) games? Yes, competition/goal-oriented behavior has been demonstrated in several paradigms to be an effective motivator of achievement. This does not mean, however, that this competition needs to be with actual human rivals. "Competing" with the obstacles of reality to solve the puzzles of nature is a strong motivator.

Rather than seeing women as lacking the aggression to compete with other researchers in "hot" areas, perhaps we should consider looking from the "female," rather than the "male," point of view and see the waste and destructiveness of confrontational competition. Finding the truth should be the major motivation. Going for the glory should be reserved for personal daydreams. "Beating out the other guy" should be something we can grow beyond.

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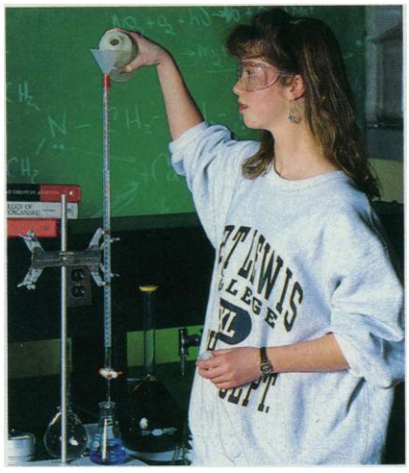

Is it really true that high school math and science teachers in the United States today make more eye contact with boys and challenge them more than girls? When I read this I wondered if I was educated in a different era. OK, I was educated on a different continent (Europe); but I never experienced this, and I know of no woman (of my era) who experienced such a bias in school.

I attended a comprehensive (state-governed) school in Scotland in the mid-1970s and was encouraged to pursue math and science. Our classes were mixed, and there was healthy competition between boys and girls; the girls usually did better than the boys in physics and chemistry, while the boys topped us in mathematics. The boys' presence in the classroom did not hinder our development; if anything, it made the classroom more interesting. It never entered my teenaged mind that I should not study or pursue science because I was a female. The questions that came to my mind were "Can I do this?," "Do I like it?," and "Will I get a job if I pursue this?" I admit that the answers to these questions depend on exposure and teaching of the subject, but surely this affects both boys and girls.

Youth "science clubs" are a laudable idea, but anyone—girl or boy—should be allowed to join. After all is not one of

the objectives of the present-day educational system to encourage the development of a racial- and gender-blind society?

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I think it is quite clear to those of us who are female scientists that gender plays a significant role in our ultimate success as a scientist. For reasons that I do not completely understand, I think there is a barrier that prevents not only mentoring but also other close personal interactions between male and female scientists. A man may prefer not to spend a great deal of time at a meeting with a female colleague because it may be perceived that he is "coming on" to her. She may not wish to spend too much time with male colleagues because she doesn't wish her husband or female friends to think she is "flirting." No matter how much we all may wish it to disappear, sex does interfere. Most women scientists I know have had the unfortunate experience of meeting a male colleague at a conference, discovering many scientific interests in common, and then realizing the male colleague has mistaken scientific interest in him as something more personal. If you are willing to sit up late and drink beer with someone, that indicates to many that you are willing to consider more intimate activities. This is a difficult issue, and I don't pretend to have any answers; but I know that it has changed my behavior at meetings. This is unfortunate, because many issues of real importance get addressed at late-night beer sessions.

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I read your feature "Women in Science '93" right through in one sitting and want to congratulate you on this year's section! I found the subject matter "Gender and the culture of science" to be informative and helpful. The sections on "female style" and "science education" were the most interesting to me. The first made me realize that I certainly have a "female style" of running my lab and working with other collaborators outside the lab. As an example, I've been writing a paper that is a joint collaboration between my lab and one in another country. The experiments have been done about equally in both labs, and my male colleague decided on the list of authors with me as second to last. I initially agreed with this, as I wanted to keep everybody happy. A female student in my lab and I have put an enormous amount of work into writing this paper, and I have now decided that if a male colleague were writing this paper there would be no question about his not being the last name on the paper. After reading your article I have decided to act like a male and put my name last!

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As long as women are pressured by family and societal preconceptions of what "feminine" means, they will be delighted to be *accepted* and to join a group or collaborate, or to work on the details and to settle into the "good girl" model assigned by a patronizing male. Once we become more confident in our capabilities, we will be ready, as many of us already are, to stick our neck out with ideas and projects that we conceived, initiated, and followed through on; and we will be will-

ing to take the heat or the credit, depending on the success of the project. "Women in Science '93" reinforced my opinion that there is no such thing as "feminine" or "masculine" science, for the same reason that (for example) there is no black or white science, and no American or German science. There is *good* science, and the rest.

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Editor's Note: The letters above are far from the only ones *Science* received in response to this year's "Women in Science" section. At the end of the section, we included a response form that invited readers to offer their opinions about a central question raised by this year's issue: whether there is a "female style" of doing science. To date, we have received more than 200 responses, the large majority from women (Only about 30 were from men). Although this is clearly a self-selected reader-response group and not a statistically randomized survey of our readers (see Editorial, 21 May p. 1055), the answers are nonetheless interesting.

Of those who responded, more than half said they believe there is a female style of doing science. Only about a quarter said they did not; less than a quarter were not sure. When the readers were offered choices of various areas in which gender style might affect how science gets done, a large majority of those responding thought that gender has "some" or "a great deal" of influence on the way a researchers runs his or her lab. Similarly, a large majority thought that gender has "some" or "a great deal" of influence on interactions with colleagues. There was somewhat less feeling that gender affects the choice of research problems, and even less that it affects the outcome of research.

When readers were asked whether the culture of science should be changed to become more accommodating to women, almost three-quarters of those responding said it should. Some typical comments were, "ruthless competition could be replaced with cooperation," "we all need to be less work-driven, publication-driven. We need credit for mentoring, teaching," and "less emphasis on aggressive behavior and realization that science doesn't require intense competitiveness and working 90 hours per week." Others mentioned the unequal burden of child care that almost always falls to women.

These readers raise serious organizational questions—not just for science but for society as a whole. Discussions of solutions must wait for future editions of "Women in Science."—***John Benditt, Features Editor***