BOOKS: WOMEN IN SCIENCE

Shifting the Spotlight from Center Stage

Jill Shapiro

The underrepresentation of women in science and engineering disciplines in the United States has been well documented over the last 30 years. It is particularly noticeable in workplaces that are traditionally seen as high status, such as universities and elite laboratories. And it continues despite significant efforts in equal-rights legislation and education. But there are places today where women learn and practice science and engineering in numbers close to equaling those of men. In many respects, these places are on the margins of recognized scientific and technical establishments, and they raise many interesting questions: What characteristics of these workplaces attract and support women scientists and engineers? How do these places differ from more conventional venues of learning and work? Are the definitions and practices of "science" in these unusual sites culturally different from those of the U.S. scientific establishment? Are the power relationships and networks different? Are women in these workplaces participating in, and helping to define, new social structures of science in which male and female are truly equal players?

Women's Science
Learning and Succeeding from the Margins
by Margaret A. Eisenhart and Elizabeth Finkel
University of Chicago Press, Chicago, 1998. 290 pp. $45, £35.95. ISBN 0-226-19544-9. Paper, $15, £11.95. ISBN 0-226-19545-7.

In the early 1990s, Margaret Eisenhart and Elizabeth Finkel, the authors of *Women's Science*, and three colleagues (Linda Behm, Nancy Lawrence, and Karen Tomso) were independently conducting case studies that involved women and science. They were examining learning—especially scientific learning—in informal and nonacademic environments, the uses of science in framing social debates, and the influences of gender role expectations and social context on female experiences in learning and work environments. Their study sites included an innovative, elective, genetics class for high school seniors; an engineering design internship required of sophomores at an engineering college; an environmental legislative action group; and a nonprofit conservation corporation. Inadvertently, all cases had higher-than-usual percentages of women participants. As the group informally discussed the findings from their individual studies, Eisenhart and Finkel became interested in developing an argument to explain the common themes about women, learning, and science across all the sites. This book is the result.

The authors first provide an illuminating overview of women's participation in science, including the (to me) startling fact that well into the 19th century, "women were expected to be interested in science and especially inclined toward it." They consider how well previous theories of women's participation in science can explain why as science became culturally dominant in the 20th century, women came to be concentrated on its margins. Eisenhart and Finkel offer a "historical-relational" perspective, focusing on how practices in high- and low-status sites relate to each other, and "how and why bright, young women, interested and prepared to work in science or engineering, could not only end up in lower status work, but actively seem to choose that work and status for themselves." They analyze this perspective using findings from the four case studies.

The case studies themselves are clearly and engagingly presented. Women scientists and engineers will recognize many of the observations and anecdotes from their own personal experience. Some common themes emerge: all sites except the genetics classroom (the case closest to conventional science) were characterized by more socially relevant activities, more expansive definitions of science and scientist, more public involvement, lower pay, and less academic power than at high-status science and engineering sites. These patterns suggest that women are especially successful in and attracted to places where there are opportunities to use science with nonscientists, in publicly meaningful ways, and with public exposure.

A disappointing finding is that, at all four sites, cultural and gender role expectations continue to cause problems and obstacles for girls and women. In considering the genetics classroom, the authors speculate that commitment to "hard science" and the "scientist" identity as defined in the more conventional academic environment may conflict with the societal pressure on girls to define their worth in terms of romantic success. Although the organizations at the other three sites ascribed to "gender neutrality," in fact they favored work activities and identities that reflect prototypical male behaviors. That is, the organizations and their employees described their work activities and identities as if these were gender neutral—as if gender did not matter. But successful women (and men) had to work in ways that are historically associated with male professionals, who have the support of wives at home and who feel safe in public places. Because these organizations appeared to treat everyone at work equally, women were attracted to them. But the actual work ethic disadvantaged women, a common problem in all sectors of scientific and engineering practice.

The authors examine whether women attempted to change the status quo in their organizations and whether the attempts were successful. They consider the implications of their findings for the learning and practice of science, engineering, and technology in schools, workplaces, and the community. In their concluding chapters, the authors offer practical recommendations for restructuring learning models to better emphasize socially and publicly meaningful science and they provide an example of a successful alternative science program. Eisenhart and Finkel also note compelling reasons to expose cultural forms that create obstacles to the participation and advancement of women in science and engineering. In sum, their book should be "must" reading for all members of the scientific and engineering communities who care about policy and practice.

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BROWSINGS

Nobel Prize Women in Science. Their Lives, Struggles, and Momentous Discoveries. *Sharon Bertsch McGrayne*. 2nd ed. Citadel (Carol), Seacaucus, NJ, 1998. 463 pp. Paper, $19.95, $C27.95. ISBN 0-8065-2025-6.

McGrayne examines the lives, struggles, and achievements of 15 women scientists, including the only 10 to have won a Nobel Prize for their research. Barbara McClintock (below) is among those who succeeded from the margins.

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