

# What's Keeping Women Out of Technical Careers?

Julia Weertman

What can I possibly write on the topic of my experiences as a woman working in the field of materials science and engineering? In efforts to explain myself to the Society of Women Engineers recently, I resurrected a small platoon of iron-willed female ancestors and paraded their accomplishments in a male-dominated world. Today the ancestors will be left in peace.

So much has been written about The Woman in Science/Engineering that it is virtually impossible to add anything fresh and new to the subject. Past articles on the subject range from reminiscences by successful women scientists to angry denunciations of painful wrongs, from why-I-became-an-engineer to why so few women choose technical careers. It is the last-mentioned point that I would like to discuss briefly, and in a very intuitive manner (in the best female tradition).

My own observations indicate that blatant discrimination against women professionals or students in the physical science-based professions is comparatively rare now. Legal remedies exist to redress most such cases. Rather, like the situation in civil rights, the nature of the problems faced by technically-minded girls and women have become more subtle in nature, so subtle that frequently neither the originator nor the recipient is consciously aware of what has happened. But the message is there all the same. It is much more difficult to eliminate this form of discrimination and discouragement that is so firmly entrenched in our society than the heavy-handed pats-on-the-behind of chauvinist male colleagues.

From earliest childhood, girls are traditionally socialized into patterns of behavior that are at best orthogonal, often antithetical to scholarly careers, especially those that are mathematically based. Dolls don't teach us much about things mechanical, unless we take them apart to see what makes them wet, and that sort of aggressive, inquisitive activity certainly is dis-

couraged in girls. Many of the early conditioning signals we receive are by no means bad. They engender, for example, nurturing, caring behavior that has tremendous societal and personal value.

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So the question becomes, how can all these pressures from society that direct girls away from a technical career be counteracted, while not destroying the beneficial humanizing messages? How to offset such mundane but harmful effects as comparatively less attention paid to girls in the class room (including university class rooms), or guidance counselor's advice that selectively steers girls away from math and science, or the practice of allowing boys to run the lab experiments while the girls are left to record the data?

I believe that all these continual anti-science influences can be nullified only by a constant barrage of positive messages. Trite though it sounds, role models of

women actually working and succeeding in science or engineering are probably the best weapons to neutralize the anti-science influences. Such models are especially effective if they are young, attractive, and definitely not nerdy. (The image of the science nerd is instantly fatal to any nascent stirrings in the female breast of interest in a technical career.) The exhibit "My Daughter the Scientist" in Chicago's Museum of Science and Industry is especially noteworthy for showing that, apart from their splendid careers, the featured women enjoy normal and full family lives. And they look remarkably normal.

Each outreach effort of a woman scientist to young girls may seem to be a tiny, ineffectual action, but the cumulative effect can be powerful. And then, we never know what one chance encounter can do. My favorite example of an outreach effort that reached a large audience is furnished by a colleague, a distinguished physicist with whom I have had the pleasure of working. She once told me of her experience, a number of years ago, when she agreed to teach a science lab course at her young daughter's private school. She set the students to putting together clocks, and used the opportunity to explain some of the relevant physics. She arranged the teams so that they were all male or all female. Thus the girls were insured of hands-on experience. At first the students, especially the boys, were dubious about this woman science instructor but as weeks went by they all became caught up in the project. The unexpected high point of success came some time later at a parents' night. The mother of one of the boys who had been in the class thanked her for the remarkable changes she had wrought in the young man. The example of this highly competent scientist/mother had given him a new respect for women, a respect that even extended to his own mother. Evidently both sexes can benefit from such outreach activities of women scientists and engineers.

So, how would I describe my own experience in materials science? Certainly it has taken hard work and a willingness to submit to constant fatigue more often than I would like, but the reason I persevered is much more subtle than that. It's the result of a combination of help from many people, strong support from my husband, lots of luck, but primarily the attitude of my parents from my earliest years that I could do anything I wanted to, and their quiet taking it for granted that I would succeed at it.

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