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WOMEN, SCIENCE, AND SOCIETY

ILLUSTRATION: ALLAN M. BURCH

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Three decades ago women's movements around the globe were rigorously questioning the exclusion of women, their interests, and visions of the good life, from policy debates, including those of science. What underlying assumptions and processes had led to the noticeable underrepresentation of women scientists and engineers, and what was responsible for their even lower numbers at higher levels in scientific and technological institutions? How, specifically, did the cultures and practices of scientific institutions contribute to the limited attention to and lack of funding for women's expressed concerns, including scientific research in the areas of reproduction, health, work, and lingering social inequalities? What assumptions and processes had led male scientists and policy-makers to equate their own concerns and opinions with human perspectives in general?

In the last 30 years, great progress has been made in analyzing and responding to these concerns. Despite the roadblocks, women have made headway, if unevenly, as they enter the fields of science and technology. Greater opportunity in these fields has allowed more women to share good wages, interesting work, and high social status associated with these occupations. What positive effects, if any, have these changes had on the sciences and their institutions and cultural practices? It appears that improving women's opportunities in science has benefited both the sciences and the cause of women in general, for the example of women's successes in fields thought to be most resistant to them has provided powerful encouragement to women seeking equality in other endeavors. Just as Marie Curie's achievements excited the imaginations of women around the world, so, too, are women today inspired by the successes of women scientists, mathematicians, and engineers. Thus, in those cases where science and technology institutions have made it possible for women to advance, they have provided a model for other fields. The entrance of women into such professions enables the sciences to take at least some credit for increasing social justice and for providing an example of what is possible far beyond the borders of scientific and technological institutions themselves.

Advancing scientific careers for women has led to other benefits for science, the most obvious being an enlarged pool of smart, well-trained, highly motivated individuals from which to staff its projects. Whatever the social, political, or psychological benefits that men may have gained by discriminating against women in the past, the intellectual loss has never been justified. Invoking gender criteria when recruiting and advancing the best scientists and engineers works against their interests.

Moreover, these days the presence of significant numbers of women in a field often increases its legitimacy and the value of its work in the public perception. For example, research that results in medical recommendations concerning women's health issues is more likely to be perceived as objective when it comes from institutions in which women have had a visible role in designing and supervising research projects. In this context it is worth pointing out that so-called women's health issues are not just about women's bodies. As long as women continue to be responsible for the daily maintenance of households and their family's health, women's health issues will include everyone's health issues. Women in Europe and the United States, no less than in many developing countries, are responsible for daily healing and pharmacological knowledge in households, doctors' offices, clinics, and hospitals. Given this existing, intense involvement, the absence of women from health policy councils neglects resources that can be used to advance everyone's health. Gender diversity in policy-makers enhances the quality of decision-making in science and technology. To stress the importance of women's perceptions and analyses, especially around issues that most affect them, is simply to point out that allowing for different viewpoints can have immense value in scientific and technological work.

Health sciences are not the only area to benefit from the enhanced role of women. Including women in the selection and supervision of projects increases the perceived legitimacy of the research results and, sometimes, the actual objectivity and effectiveness of research projects. Any aspect of human life where women and men are assigned different roles—whether nature or culture makes the assignment—is one in which gender-based knowledge will develop. This is true of women both in their professional and in their more traditional roles, where they are often in the best position to notice certain ranges of environmental problems as they observe neighborhood patterns of children's illnesses, the funny look of washing-machine water, or the peculiar smell of the dirt in which their children play. In societies where women are responsible for local agriculture, animal husbandry, and forestry, they develop repositories of knowledge about their environment that is continually tested and revised as the environmental and social conditions of their work change.

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*S. Harding, *Social Research* (special issue on politics and science) **59** (no. 3), 567. Reprinted in M. Jacob, Ed., *The Politics of Western Science* (Humanities Press, Atlantic Highlands, NJ, 1994), pp. 1640–1990.

These repositories of knowledge are proving increasingly valuable in the Third World as conventional Western prescriptions for development are being reevaluated. There are instances when the scientific and technological expertise of the North can learn from the time-tested practices of other cultures for sustainable development.

Women's greater participation in the design of scientific projects can also improve the care and sensitivity with which existing methods are practiced. For example, the Food and Drug Administration in the United States is responsible for ensuring that the populations on which drugs are tested more closely resemble the populations for which the drugs will be prescribed. There are many reasons why women have previously been underrepresented in drug trials. Some are perfectly legitimate in that scientists wanted to make certain that women's reproductive systems were not damaged by drugs with unknown effects. Other reasons are less defensible. Women, too, regularly take aspirin and other medicines, yet many of these drugs have not been tested on women. Here we enter the complex realm of culture and politics. For example, it has been commonly assumed that women's bodies, for the purpose of scientific research, are not as representative of the species as are men's. Recall all of those illustrations in anatomy and physiology texts, where women's bodies appear only in the section on reproductive systems. What facts about women's body structures and systems have been obscured by the implicit assumption that the only differences between the sexes of interest to science are reproductive differences? Fortunately, increased interest in women's athletics and exercise regimes has begun to produce the kind of information about women's bodies that can, for instance, save women from the sports and exercise injuries that have been the consequence of that assumption.

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Yet it is unlikely that such new insights would have occurred without the women's health movements. With their diverse coalitions of lay activists, scientists, and science and technology policy-makers, these movements have contributed not only to the pursuance of more health-enhancing and effective reproductive practices and contraceptives, but to greater attention being given to the whole of women's health issues. Under Bernadine Healy's leadership at the National Institutes of Health (NIH), the Women's Health Initiative began to collect information on how hormones, nutrition, and life-style factors affect the incidence of strokes, heart attacks, cancer, and osteoporosis in women. Would this study have been undertaken without the women's health movement? Would it have been conducted if a man had been the head of NIH? We cannot know the answers to these questions. We can safely assume, however, that the women's health movement's long agitation for the collection of such data, and possibly also the appointment of a woman to head NIH, made a significant contribution to the greater emphasis on health issues that concern women.

These observations provide an opportunity to rethink the conventional understanding of the history, philosophy, and social relations of science. Some political pressures can have negative effects on the growth of knowledge, while others can have positive effects. Examples of some positive effects of other political movements on science are the roles played by the environmental movements, AIDS activism, the race-based civil rights movement, and, most recently, the nutrition and anti-smoking movements. Attention, also, to issues that concern women's movements can enhance our understanding of the philosophical and social aspects of science and technology.

Consider two changes in the traditional philosophy of science to which women's movements have contributed. The first has to do with the assumption of neutrality in the research process. Is maximizing the objectivity of research always advanced by maximizing the social neutrality of research processes? The neutrality ideal is maximally effective when it is invoked in contexts where social beliefs differ among members of the scientific community. But how is it useful in detecting social assumptions shared by an entire scientific community—women and men alike—such as assumptions about women's biological inferiority? In such cases it takes political involvement to move scientific institutions to question prevailing assumptions. Moreover, the neutrality ideal cannot recognize or provide resources for distinguishing between social or political assumptions that tend to obstruct the growth of knowledge and those that could advance it. We need "strong objectivity," as I have referred to it, to detect the most foundational assumptions that shape our own belief systems.*

In a related way, attention to women's concerns has helped to reveal the value of cognitive diversity in the scientific process. Just as biodiversity is invaluable for human well-being (as well as a good in its own right), so, too, is cognitive diversity. Few any longer question women's ability to apply the scientific method or to organize complex research projects, even if they do sometimes approach their work in ways less favored by their male colleagues. The human intellectual repertoire consists of many styles and many ways of organizing the production of knowledge. There exists no justifiable scientific or philosophic reason to restrict them to the small numbers that have been favored at particular times and places. "The" scientific method can be enhanced by our appreciation of the wealth of intellectual resources to be gained by valuing and promoting cognitive diversity.

"Women's" issues matter to women in science and technology fields, and in society at large. I have suggested how they also matter to the sciences as such, in ways perhaps initially unexpected. The resources that women's issues make available to the sciences have not been fully realized. Too often women's interests in and desires for knowledge are compromised to satisfy competing economic or political agendas. Often they are watered down or coopted and the business of science and technology institutions continues with little change. Moreover, as long as poverty, racism, environmental destruction, and global injustices prevail, women, as well as men, will not realize the full benefits of science and technology. We can at least hope that the gains made in institutional practices and in the growth of knowledge during the last three decades—the result of positive interaction between women's movements and scientific and technological institutions—will persist.

ILLUSTRATION: TERESE WINSLOW