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After Absolute Neutrality

Expanding "Science"

Sandra Harding

In 1962, Thomas Kuhn's influential account of scientific change showed how the new social histories of modern science revealed "the historical integrity of that science in its own time" (Kuhn 1962). More than three decades of subsequent studies have produced accounts of modern sciences that are far more accurate to the recorded history of science and to current scientific practices (for example, Bloor 1977; Galison and Stump 1996; Latour 1988; Latour and Woolgar 1979; Quine 1953; Schuster and Yeo 1986; Shapin 1994; Shapin and Shaffer 1985). Moreover, gender analyses have extended such "postpositivist" accounts to show the significant respects in which modern sciences have displayed a historical integrity with the gender relations of their era (for example, Braidotti et al. 1994; Haraway 1989; Harding 1986, 1991; Keller 1984; Merchant 1980; Plumwood 1993; Rooney 1994; Schiebinger 1993; Shiva 1989; Wajcman 1991). Finally, multicultural and postcolonial science and technology studies have revealed how modern sciences have been permeated by distinctively European projects that have often been Eurocentric, racist, imperial, and colonial ones. Sciences have been part of the imperial and colonial projects of their cultures (Goonatilake 1984; Harding 1998; Joseph 1991; Lach 1977; Needham 1954ff; Watson-Verran and Turnbull 1995).[1] These three fields of post–World War II science studies eliminate the possibility of justifying modern science as culturally neutral, and thus as the kind of unique historical phenomenon that is the preoccupation of the older histories and philosophies of science. If it is not unique in such ways, do we then need to revisit and reevaluate the value and viability of other cultures' science traditions?

Such issues are not the topic only of scholarly projects. Over the last half century the base of the global economy has shifted from heavy industry to the production and management of information. Scientific and technological productions are now the foundation of the global political economy. This economy continues to expand into new areas around the globe, and to structure more deeply and completely daily life in societies in which it has already been present. Furthermore, as this capitalist economy spreads around the globe, so too does the shared conceptual

framework common to European and American democracies, modern sciences, and capitalist economies. Emerging in the same historic eras, all three value the "disenchanted" material world, cultural neutrality, rational processes, objective decisions, the interchangeability ("equality") of their central actors, and other features. Which conceptual components of this scientific, political, and economic framework should be preserved and which revised or abandoned? In addressing this issue, feminist science studies continues to provide an important voice in renegotiating the terms of global democracy as it critically examines such notions as objectivity, rationality, good method, and—the topic of this essay—what should be considered to constitute "real science."

A central challenge for anyone reflecting on the sciences these days is to figure out how to think about knowledge claims that are permeated by cultural values and interests, and yet are also "true": empirically reliable, and by other conventional measures, the result of "good science." As long as cultural partisanship was automatically considered a sign of impure science, the production of false claims, or "bad" or "not really" science, this difficult issue never arose. We could all safely stay preoccupied with excluding politics and cultural values from scientific inquiry and the results of its projects. However, if even the very best of international sciences are considered to be fully part of their historical eras, bearing the cultural fingerprints of those eras and the subsequent ones that practice and maintain them in their cognitive core—their methods, formal results of research, and basic metaphysics (for example, distinguishing between primary and secondary properties)—then this difficult issue looms before us. It is not just that the questions sciences ask reflect culturally specific concerns, although this is a major source of the "localness" of international as well as of other kinds of sciences. Equally significant, the resources materially and culturally available to seek answers to such questions, including methods of inquiry and standards for justifying knowledge claims, also bear such cultural fingerprints. Consequently, modern international sciences, no less than the knowledge systems of other cultures, reveal culturally distinctive patterns of systematic knowledge and of systematic ignorance and error.

To say this is by no means to deny that nature's order must play a central role in the knowledge system of any culture that manages to survive for even a day. And even if international sciences cannot achieve absolute cultural neutrality, clearly many of their elements regularly do achieve a kind of relative neutrality and autonomy. International sciences obviously have developed effective strategies for downplaying the influence of many of the kinds of values and interests of their eras on the results of research. But so too, it turns out, do elements of knowledge systems of other cultures achieve such degrees of cultural neutrality, as evidenced, for example, by their adoption into modern sciences—a point I will address below.

Moreover the culture-permeated versus culture-free contrast has turned out to obscure other important issues, such as which kinds of cultural elements do and should we want to permeate our sciences for scientific and/or political reasons? And who should make such decisions if they are not trusted solely to scientific experts who, it was presumed, know how to eliminate all social values and interests from their projects? Should we seek answers to such questions in the abstractly democratic rhetorics that modern sciences have favored since their origins—for example, in their concerns for the social equality of observers, for research processes that avoid "might makes right" in the production of knowledge, for public access to the results of research? What concrete social relations in and around the sciences could make such democratic sentiments more effective, in gender and global contexts, too? Such questions are not ones that scientists are prepared through their training to think about, nor have most nonscientists gained the skills and knowledge necessary to answer them.

Feminist science studies have made important contributions to raising and advancing thought about such issues. Around the world women have called for more accurate accounts of our bodies, environmental hazards to us, nature's pharmacological resources, sustainable agriculture, energy, and water supplies, and other aspects of nature where the prevailing sciences have not yet fully responded to women's scientific and technological concerns. In addition, we have wanted such projects linked to pro-democratic agendas that benefit and empower women, and that do so for women around the world (Braidotti et al. 1994).

My project here is to try to identify kinds of knowledge-seeking practices that have become good candidates for counting as real sciences once the absolute neutrality ideal is left behind. By "real sciences" I mean to refer to ones that work in everyday life as well as in institutional projects, and that reveal nature's order, whether or not modern, international sciences have recognized them as such. Once the contrast between culture-free and culturally embedded sciences is abandoned, the importance of many more of women's interests and practices, in Europe and America and around the globe, can be appreciated.

In the next section, I look at new ways of thinking about the necessity (and desirability) for all sciences to be permeated by aspects of their historical era. I then outline how five kinds of inquiry not regarded as fully scientific in the older philosophies and histories of modern, international sciences gain that status in the analyses developing today that are guided by the new science studies. Along with what we can now see as culturally embedded international, modern sciences should be included overtly mission-directed research, much of engineering and technology development, hybrid sciences composed of natural and social elements (such as medicine or environmental sciences), the everyday science of farmers, mechanics, and infant caretakers in modern Western societies, and—last but not least—non-Western cultures' scientific and technological traditions.

Local Knowledge Systems

The three science studies movements referred to above reveal the current widespread understanding that all knowledge systems have been in significant respects "local"—that is, they have an integrity with their historical era, in Kuhn's words. Equally important, they reveal the necessity of this historic integrity, and the cognitive resources available to sciences when they make use of such local resources. Most surprising, it turns out that in some cases it is precisely a science's permeation by a set of cultural values that is responsible for its cognitive advances (Harding 1998). Therefore, to eliminate all of the cultural features of a scientific system would be to deprive it of its most energizing and fruitful elements.

Consider how, first, different societies inhabit different parts of heterogeneous nature. Some live on the shores of the Atlantic, others in the Sahara Desert, some in arctic and others in tropical climates, some in terrains afflicted with tornados and others in monsoon territories. Some travel from Polynesia to Australia, others from Spain to the Americas, or from Cape Canaveral to the moon. Obviously, each culture will have distinctive interests in the environment with which it must interact. However, even in the same environment, different cultures will ask different questions. On the borders of the Atlantic Ocean, some will want to fish in the ocean, others to use it as a coastal trading route. Still others will want to use it as a vista and playground for expensive homes built along its shores, to mine the oil and minerals beneath its floors, as a dump for toxic wastes, or to restore it to sustainable environmental health. Each such culture will develop distinctive patterns of knowledge and of ignorance that are created by their interests in the waters before them—by the questions that they ask, and those they don't ask.

If the familiar jigsaw puzzle model of nature's order were a reasonable one, all of the patterns of knowledge could be fit together into the one true account of nature's singular order, each culture's pattern of knowledge filling in spaces occupied by another culture's patterns of ignorance. For example, the environmentalists would neatly replace the patterns of ignorance found in the "spaces" between the patterns of knowledge of the miners and toxic dumpers, not disturbing the patterns of knowledge but merely expanding them to include the information produced by other social interests. To take another example, the Asian acupuncture pattern of knowledge would be thought of in this model as substituting for international biomedicine's historic ignorance of how to manage chronic pain. Even if we retained this jigsaw puzzle model of the growth of scientific knowledge, we can see the importance of appreciating the culturally distinctive values and interests that would lead different cultures to ask different kinds of questions about nature's order. Whenever any of these knowledge systems are lost, other cultures are deprived of valuable resources, now and in the future.[2]

Yet the jigsaw puzzle model is problematic. Cultural interests sometimes conflict, producing conflicting patterns of "knowledge." For example, interests in maximizing industrial expansion and in agribusiness can conflict with interests in keeping environments sustainable. The former interests assume that nature will always renew itself regardless of how humans interact with it; environmental analyses deny this assumption. Since scientific theories are always underdetermined by their evidence—they always, and usefully, generalize to cases not yet observed—a conceptual framework valuable for success in one project, such as industrial expansion, can be disastrous for success at another, such as sustaining environments. My point here is that the cultural permeation of scientific questions by historical interests can by no means be conceptualized as an innocent fact that can be accommodated by the standard jigsaw puzzle model of scientific advance.

However, two other culturally local features of every knowledge system make the jigsaw puzzle model even less reasonable. Complete cultural neutrality is not only impossible in principle, it is also undesirable for scientific and epistemological (as well as political) reasons. The mention of theoretical frameworks above points to how cultures develop distinctive discursive resources to think about nature's order. They draw on or develop culturally relevant metaphors, models, and narratives to conceptualize and direct their research projects. For example, in the history of European sciences, nature has been conceptualized as a benevolent mother ("Mother Nature"), as a cornucopia of endless resources, as a product of a Christian God's mind, as a mechanism like a clock, and—to skip five centuries—as a complex and different kind of mechanism such as a self-correcting computer, or as a spaceship or lifeboat in the recent environmental models. These metaphors, models, and narratives are not just useful pedagogical or heuristic devices. Instead, they are an integral part of scientific inquiry, directing scientists to examine certain kinds of phenomena instead of others, and guiding how science will expand or correct its hypotheses in the course of research. To eliminate this kind of cultural specificity would be to lose for science the endless supply of such resources that enable human cultures to imagine effectively the constantly changing phenomena with which they must interact.

Moreover, different cultures have different ways of organizing the production of knowledge. As modern science has always argued, how one interacts with nature shapes what one can know about it. Modern physicians and indigenous healers can both learn things that laboratory medical research cannot. Farmers, herders, and sylviculture workers come to understand aspects of nature's order that scientific agriculture accidently or intentionally ignores (Braidotti et al. 1994; Shiva 1989). Pasteur had to reorganize where, how, and by whom scientific knowledge was produced in order to achieve the results of his research (Latour 1988). Physicists, engineers, and mathematicians with different disciplinary-based notions of randomness had to invent new such notions that would be suitable for the virtual reality project in which they were jointly involved (Pickering 1992). Hundreds of other studies also reveal the importance to cultures' scientific projects of local discursive resources and ways of organizing the production of knowledge.

These studies bring us a long way from the older ideals of absolute cultural neutrality for real sciences. Let us turn to analyze the kinds of knowledge-seeking practices that these studies in effect situate as "real sciences." What relevance do these have to those interested in women, gender, and science?

More Real Sciences and Their Gender Aspects

Mission-Directed Research

The fall of the neutrality ideal reveals the difficulty of locating the border between what used to be thought of as "pure science" and mission-directed research. In thinking about the former, conventional accounts have tended to focus on the epistemic goals and motivations (for example, the search for the facts or truth about a phenomenon) that overtly guided the research of individual scientists, or of whole laboratories and fields of science. They have been little concerned with the professional ambitions of individuals, scientific fields, or institutions, or with the larger social projects that explicitly or implicitly made a research topic "interesting." Furthermore, if scientists were unaware of any mission toward which their research was directed, then the research could be counted as "pure science." This view of science as a product of individual scientists' conscious motivations is problematic in a number of respects.

In the first place, there are certain kinds of research that clearly are directed by social missions, and yet these social and even political goals have not been thought to impugn the objectivity of the research in any distinctive way. One such example was, until at least as late as World War II, military research. As Margaret Jacob says in her influential account of the scientific revolution,

> Western science at its foundations, as promoted by its most brilliant as well as its most ordinary exponents, never questioned the usefulness of scientific knowledge for warmaking. I know of no text from the early modern period which suggests that the scientist should withhold his knowledge from any government, at any time, but especially in the process of preparing for warmaking. Indeed most texts that recommend science also propose its usefulness in improving the state's capacity to wage war more effectively, to destroy more efficiently (1988, 251).

During World War II, nationalism and just wars were considered acceptable missions for science that would not impugn the cultural neutrality of their research. Moreover, the entrance of the United States into international science was made possible by the shift of research agendas in physics to national security in the period from 1940 to 1960 (Forman 1987). The Manhattan Project in particular gained the United States membership—indeed, leadership—in postwar scientific

research. Mission-directed research, even when the mission permeates the cognitive content of the results of research, can produce the highest-quality science. Thus empirically true scientific claims can be cognitively permeated (in the ways indicated in the preceding section) by cultural projects.

Another such area is medical and health sciences. No one thinks that the desire of entire research communities to find a cure for cancer or AIDS in itself threatens the validity of the research that such communities certify as objective. Yet such desires are by no means culturally neutral as we can recognize if we think of such groups as Christian Scientists, who refuse biomedical intervention in health matters, or of other groups who believe that what international science conceptualizes as a curable physical illness is often a consequence of bad social relations or of God's will, and is more effectively dealt with in social or religious relations. (Such arguments are common about both AIDS and cancer.)

There are two additional problems with conventional thinking about mission-directed research. It is clear that funders can have goals of which scientists are unaware. For example, military funding of "basic research" is selective about which kinds of research it funds. It expects to reap military benefits from knowledge of some aspects of nature's order but not from knowledge of other aspects. Cultures' patterns of knowledge and ignorance represent the combined interests of all the various social forces shaping scientific research. Finally, this belief puts a premium on supporting and maintaining the ignorance of scientists about the possible or even obviously inevitable social assumptions and consequences of their research. Scientists, individually or collectively, can feel most confident that they are conducting objective research if they remain conscientiously ignorant of what goes on outside the laboratory door. Yet, if scientists are to be partners with others concerned with improving scientific practice and theories about science, such "scientific illiteracy" on the part of scientists is insupportable.

What implications do these facts about mission-directed research have for feminist concerns? For one thing, just because a research project is guided by feminist "missions" should not be sufficient reason to deny it the status of real science, or even of maximally objective science. Feminist concerns for promoting research on women's health issues, sustainable environments for women, or on technical developments to serve women's needs do not in themselves create the kinds of "biases" that damage the reliability of the results of research. To argue otherwise would be to admit that any scientific research directed to the interests of a particular group of people—children, the sick, the hungry, victims of environmental destruction, ocean travelers—is thereby damagingly biased. The language of "bias" that associates any cultural interests with a damaging lack of objectivity obscures issues about how partisan research, engaged to promote culturally distinctive interests and values, is inevitable, but not necessarily detrimental to the growth of scientific knowledge. Of course, such interests and values

can indeed lead to empirically unreliable results of research, but this is not automatically the case. The fact that a project is guided by feminist concerns is not in itself reason to suspect the objectivity of the results of that research. Thus judgmental relativism is not inevitable if we give up the language of "bias."

On the other hand, just because a scientist is a "good feminist" in every conscious area of life doesn't ensure that the research such a scientist produces is gender-neutral and unbiased. It is not always obvious to the recipient of research funds what the funders' missions are. Sometimes even the latter can intend to support only gender-neutral work or even feminist work and yet make assumptions that support larger social missions of which they would disapprove were they were aware of them. For example, the understandable interests in discovering how men and women differ psychologically, biologically, or in some other way support the androcentric mission to sustain the belief that men are fundamentally different from women. Similar arguments have been made about the only apparently innocent search for racial differences. Thus mission-directed sciences can be just as "real" as those that do not carry their missions on their sleeves, so to speak.

Engineering and Technology Development

Engineering and technology development constitute another such real science. Three important shifts have changed the way these are conceptualized in the new science studies. In the first place, modern sciences cannot be separated from technology development, since their projects frequently seek to provide information to resolve what are defined as technological problems, as much military-directed or agricultural research does.[3] Moreover, scientific advances make possible new technologies and, in some contexts, make them virtually inevitable. What forces could have controlled the development of car-centered cultures in the cultural and political environment of the United States once the basic information for constructing internal combustion engines became available? Most important, sciences' own methods of inquiry are themselves technologies. A research design can usefully be understood as a production device or machine, made up of instructions, various skills and techniques, sometimes hardware, and the individuals who use and maintain these components, for interacting with natural and social worlds in order to generate distinctive types of information. And we can reflect that while sciences do make technologies available, it is equally true that new technologies make new sciences available. Photography and computers provide just two such examples of technologies that have led scientific inquiries in new directions.

Second, such research technologies are not themselves culturally neutral. Artifacts have politics, including gender politics, though they do not *determine* social consequences, as the older technological determinists supposed (Lie 1995; Wajcman 1991; Winner 1977). Gadgets, tools, machines, and built environments, among other kinds of technological achievements, make possible some kinds of social projects and limit others. They require various kinds of expertise that are rarely made available to everyone, and they organize human labor and leisure in culturally specific ways. Consider, for example, the diverse politics of birth-control devices, some of which can make it possible in a particular social environment for women to express their sexuality while controlling their own fertility or, in other environments, can ensure that poor or racially marginalized women will be prohibited from birthing the children they desire.

For these reasons, it is a mistake to think of engineering and technology development as only applied science. Instead, technology development is itself an integral part of scientific growth, and it can produce distinctive knowledge about nature's order. Gender analyses have made important contributions to such understandings. Moreover, responding to women's technological needs can advance the growth of scientific knowledge in diverse fields. However, attention to the gendering of technologies is especially important for women in the so-called developing societies, where the bad effects of development sciences and technologies on women have been a major feminist concern (Braidotti et al. 1994; *Gender, Technology, and Development* 1997ff; Harcourt 1994; Harding and McGregor 1996; Mies 1986; Shiva 1989; Sparr 1994). The de-development and mal-development of the already most economically and politically disadvantaged groups around the world, in which women and their dependents are disproportionately represented, turns out to have been a precondition for the economic growth of elites, through which benefits of development flow to those already economically and politically advantaged, in the so-called developed as well as developing world.

Natural-Social Hybrid Sciences

The fall of the absolute neutrality ideal has also improved the scientific status of such fields as medical and health sciences, environmental sciences, and others in which it has been recognized that one needs knowledge of both nature and social relations in order to understand the phenomena of interest. Bodies and their environments are influenced by social factors as well as natural causes. Social processes bring certain natural causes into play, and natural processes can stimulate social responses. One cannot even specify which features of a human or his or her local environment are due to nature and which to culture, since cultural processes shape how genes are expressed and species develop. Moreover, as we have seen above, the objects of study of the natural sciences are always socially constituted as such objects—for example, as races versus populations, as a biologically weak sex versus a physically restricted one, or as weeds versus not profitable for export, or as contributors to biodiversity. Furthermore, as historians and sociologists point out, social knowledge has always been crucial for the development

of scientific processes in the history of international science, though this feature was obscured by the ideology of the neutrality ideal (Latour 1988; Schuster and Yeo 1986; Shapin 1994; Shapin and Shaffer 1985).

Feminism has long insisted that the binary of nature versus culture obscures ways that the purportedly purely natural is also a historically shifting cultural category. Such analyses have stressed the importance of exploring the joint and even coconstituting operations of nature and culture in such areas as health and environmental sciences rather than restricting funding primarily to research projects that ignore the social influences on health and sustainable environments. It is also important to consider whether gender analyses should give greater attention to ways in which the purportedly only cultural also has roots in the natural. Their failure to do so has tended to reify the cultural in just the kinds of ways that they have criticized mainstream philosophies of science for reifying the natural.

Other Cultures' Sciences

I have focused primarily on international sciences in the catalogue above of new kinds of "real sciences." However, the scientific status of many other cultures' knowledge systems also is enhanced by the demise of the absolute neutrality idea. It was precisely the contrast between purportedly value-neutral international sciences and what was considered to be "only" ethnosciences or folk sciences in other cultures, permeated by religious and other culturally local assumptions, that gave so much status to the absolute neutrality ideal of international sciences. Most obviously, other cultures have in the past also developed many kinds of effective systematic knowledge-seeking about their bodies and environments (Goonatilake 1984; Lach 1977; Watson-Verran and Turnbull 1995). Many of these continue to develop today in other cultures' medical and health systems, agricultural practices, and environmental management, to pick three of the most obvious such areas. The sciences that became international sciences have long borrowed elements of other cultures' knowledge systems, and continue to learn from them today. As I indicated earlier, acupuncture has recently been adopted into modern biomedicine for the management of chronic pain, and pharmaceutical companies are prospecting in indigenous knowledge of communities in Amazon forests and in the knowledge of Asian and other health therapies. International development agencies are learning how to support some of the existing practices of farmers in developing countries rather than replacing these with what often turned out to be inferior, scientific, modern practices (Bass 1990; Braidotti et al. 1994; Hess 1995; Shiva 1989).

There is no justification for believing that international sciences could in principle tell us everything we want to know about our bodies and their environments, now or in the future. Nature continually produces new phenomena, and cultures continuously generate new interests, discursive resources, and ways of

organizing the production of scientific and technological knowledge. The world contains multiple scientific traditions, and it is crucial to the continuing creativity of each that the others flourish. Human cognitive diversity is as much a fragile and threatened resource as is nature's biodiversity. Moreover, to the extent that international sciences are embedded in the expansionist projects of the already economically and politically advantaged societies, and thus directed toward narrow, economistic, and antidemocratic conceptions of "human welfare," rather than also social, political, cultural, aesthetic, or even spiritual aspects of human development, the knowledge projects of other cultures provide especially valuable resources for guidance in understanding noneconomistic aspects of natural and social relations.

Women have made and continue to make important contributions to the knowledge traditions of other cultures. Moreover, to the extent that the gender-integrationist ideal characteristic of public agenda feminism in the United States and Europe has been less powerful in other cultures, women's and men's knowledge systems are more distinctive. Women farmers, herders, sylviculturalists, traders, healers, physicians, pharmacologists, and artisans are some of such groups that have developed distinctive knowledge traditions. Women's scientific and technological creativity is more easily visible in societies traditionally more sex-segregated than U.S. society today, yet in any context in which human activities tend to be gender segregated, women, like men, will develop and maintain distinctive systematic bodies of knowledge about the world with which they interact. This leads to a consideration of one more kind of systematic knowledge.

Everyday Science

What about the challenges to gain knowledge in everyday life? Sciences of other cultures and the natural-social hybrids mentioned earlier have often been developed through institutions and processes very different from those characteristic of the ideal of pure sciences. The availability of abstract principles to guide research and its application is more important in some kinds of sciences than in others. Farmers, fishermen, artisans, mothers, and indigenous healers also develop systematic knowledge about the constantly changing bodies and environments with which they interact, and they constantly seek to improve the knowledge they have. Indeed, some observers have argued that their work is often more original and creative than the work of highly trained scientists for whom the factorylike structure of much contemporary research blocks the possibility of their conceptualizing and designing their own research projects (Goonatilake 1984).

This kind of inquiry has been one of the major influences on feminist science studies and its philosophies of science. In everyday life, women tend to develop distinctive knowledge about their own bodies and the bodies of children, family, the sick, and the elderly that they tend. The women's health movement is one group

that has "started from women's lives," as the feminist standpoint theorists put the point (Harding 1986, 1991), to ask the kinds of questions that have been ignored or devalued in the purportedly culturally neutral mainstream sciences. Feminist approaches to environmental sciences grew out of the everyday knowledge and questions of women. It is mothers who are often the first to chart patterns of neighborhood childhood sicknesses and of household water quality. Women farmers map environmental changes. And such kinds of everyday science have led to central feminist science studies concerns about whose interests are served by the projects of mainstream sciences. By starting from everyday life in order to "study up"—to critically examine the dominant institutions and their conceptual frameworks—feminist science studies has asked how to improve the very standards for what should count as objectivity, rationality, good method, and, indeed, science itself.

An Epistemological and Political Question

I have been arguing that the demise of the absolute neutrality ideal has made possible the expansion of science's horizons to include a number of other kinds of systematic knowledge-seeking with which international science conventionally contrasted its own purportedly culturally neutral results of research. Women's scientific and technological interests and desires gain status once these kinds of inquiry are also understood to be making important contributions to the growth of knowledge. Concerns to protect purportedly culture-free sciences from contamination by social values and interests can now be replaced with questions of which social values, interests, discourses, and ways of organizing the production of knowledge can and should flourish, and which should be eliminated or carefully controlled. The democratic elements of traditional "modern" scientific thinking offer great resources here, though feminist and other pro-democratic political philosophies must help us all to critically evaluate how to revise and transform such elements into ones that benefit women around the world. What should count as science will remain both an epistemological and a political question. Feminist science studies has come to have a central voice in the contemporary global project of redefining the terms of democracy. At its best, it has insisted that the democratic development of science and society requires that those who bear the consequences of science and technology policy decisions have a proportionate share in making them—in short, that women's interests and values count.

Notes

1. Indeed, it should be regarded as Eurocentric to imply, as I did above, that only the dominant science traditions today in the West are "modern sciences." All scientific traditions existing today are modern, since they have developed in response to the new ideas to which they have been exposed as well as to changing environmental conditions. I shall frequently refer to the European "modern science" tradition by another of its familiar names: "international science." This term captures the extent of its adoption today without implying that its claims are transcultural or universally valid in the conventional sense.

2. And, of course, when the cultures themselves are intentionally destroyed or happen to die out from plagues, starvation, or environmental destruction, the disappearance of their knowledge systems is only one of the losses to humanity.

3. I use the phrase "defined as technological problems," since military actions are not the only way to solve political problems, nor is the "green revolution" the only way to solve local food shortages.

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Laboratories Without Walls

The Science Shop as a Model for Feminist Community Science in Action

Lisa H. Weasel

A Personal Path to Feminist Science Action

I belong to a generation of feminist scientists lucky enough to have had their feminism and their scientific training side by side, yet still not lucky enough to be able to practice a consciously feminist science within our chosen fields. By this I mean that I became a feminist as I became a scientist, that like many feminist scientists of my generation I was drawn to feminism through my politics, and to science through my passion for understanding and untangling the mysteries of nature. Behind my commitment to both science and feminism was the belief that both paths provided a means for promoting positive change in the world. Through feminist theories and community activism, I believed that I could help to understand and alleviate social inequities based on the intersecting power imbalances constructed around categories such as gender, race, class, ethnicity, age, and sexual orientation. Through my scientific work in the laboratory, I believed that I could make an active impact on people's lives by understanding and alleviating physical maladies affecting the body, such as breast cancer, autoimmune disease, and malnutrition.

Yet while these twin paths of feminism and science may have paralleled each other in the early stages of my education, I found that these two paths never fully intertwined. On the contrary, they seemed to diverge ever more and in fact threatened to pull one another off course as I made my way through graduate school, postdoctoral training, and as I entered the faculty ranks. Now, having held faculty positions in both women's studies and biology, I have at times been seen as an outsider in comparison to fellow women's studies colleagues from the humanities and social sciences, while at other times been chided and even exiled by fellow scientists for using the "F" word (*feminism*) in my courses and research. To many, I am no longer considered a "proper" scientist since I do not run a laboratory, yet my training in science has often precluded me from full membership within the supposed interdiscipline of women's studies. Looming behind this