The Science Question in Feminism

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Whose Science? Whose Knowledge?

Thinking from Women's Lives

Sandra Harding

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edge. Democracy and science are deeply linked in ways I will explore further.

One more issue to be pursued later should be raised at this point. If feminists are critical of scientific method, is there an alternative feminist method of research that has a better chance of producing unbiased results? The moment one tries to answer this apparently perfectly reasonable question, such confusions emerge from its formulation that no simple, unproblematic answer is possible. In a certain sense, there is a distinctive feminist "method" of research—a distinctive way of beginning, of finding the most fruitful questions, of grounding knowledge claims. But in another sense, the very desire for a method of inquiry—a technique, formula, algorithm, or intellectual mechanism—that can guarantee objective accounts of women's lives and the social order should be regarded with suspicion. Feminism is a politics too, and commitment to that politics cannot be separated from feminist standards for what should count as reasonably produced claims to knowledge.[29]

The Sexual Meanings of Nature and Inquiry

Science produces information, but it also produces meanings. Indeed, as even some conventional philosophers of science realize, the results of scientific research *are* information only if they have meaning for us; an undecipherable string of numbers or nonsense syllables is not yet information. Moreover, science produces meanings of its own activities which are intended to create resources for it. It leads us to think of its kind of method as a moral good, as the place where the inherently positive value of science is to be found—hence the term

29. This method issue has been a source of confusion among feminists. See, e.g., Sandra Harding, ed. *Feminism and Methodology: Social Science Issues* (Bloomington: Indiana University Press, 1987); Sandra Harding, "The Method Question," *Hypatia* 2:3 (1987) (a different version of the introduction to the edited collection). See also "Commentary by Naomi Scheman," "Comment by Dorothy Smith" (on the *Hypatia* essay above), and Sandra Harding, "Response" (to Scheman and Smith), *American Philosophical Association Newsletter on Feminism and Philosophy* 88:3 (1989). Dorothy Smith objected to my criticism of feminists and others for trying to conceptualize political changes in the sciences in terms of changes in method. I should have noted in the original essay that Smith has been radically transforming the term "method" in an important way (her work is discussed esp. in Chapter 5).

"positivism." Science produces meanings of itself as a "calling," as one of the most important supports of the rational life, as a heroic struggle, as the paradigm of a distinctively human activity, as the apogee of civilization, and so on and so on. It produces meanings of its methods of research as stripping the veils from nature, or torturing nature to reveal her secrets, or, more attractively, as attempting to defeat "might makes right" in the domain of empirical knowledge. And science delivers meanings for the nature it describes and explains—as something requiring domination or hiding its secrets, as a worthy opponent, even as the bride of the scientist.[30]

Hence, another focus of the feminist examination of science uses techniques of literary criticism, historical interpretation, and psychoanalysis to "read science as a text." The text is the whole of science: its formal statements, intellectual traditions, research practices, social formations, the scientific and popular beliefs about it, and so on. Francis Bacon appealed to rape metaphors to persuade his audience that experimental method is a good thing: "For you have but to hound nature in her wanderings and you will be able when you like to lead and drive her afterwards to the same place again. Neither ought a man to make scruple of entering and penetrating into those holes and corners when the inquisition of truth is his whole object."[31] Paul Feyerabend, a contemporary philosopher of science, has recommended his own analysis over competing ones by saying that "such a development . . . changes science from a stern and demanding mistress into an attractive and yielding courtesan who tries to anticipate every wish of her lover. Of course it is up to us to choose either a dragon or a pussy cat for our company. I think I do not have to explain my own preferences."[32] In his Nobel Prize acceptance speech, physicist Richard Feynman called the idea that inspired the work for which he won his prize an "old lady, who has very little that's attractive left in her, and the young today will

30. See, e.g., Morris Berman, *The Reenchantment of the World* (Ithaca: Cornell University Press, 1981); Brian Easlea, *Witch Hunting, Magic, and the New Philosophy* (Brighton, Eng.: Harvester Press, 1980); Brian Easlea, *Fathering the Unthinkable* (London: Pluto Press, 1983); Keller, *Reflections;* Leiss, *Domination of Nature;* Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution* (New York: Harper & Row, 1980).

31. Quoted in Merchant, *Death of Nature,* 168.

32. Paul Feyerabend, "Consolations for the Specialist," in *Criticism and the Growth of Knowledge,* ed. Imre Lakatos and Alan Musgrave (New York: Cambridge University Press, 1970), 229.

not have their hearts pound when they look at her anymore. But we can say the best we can for any old woman, that she has become a very good mother and has given birth to some very good children. And I thank the Swedish Academy of Sciences for complimenting one of them."[33]

When we realize that the mechanistic metaphors that organized early modern science themselves carried sexual meanings, it is clear that these meanings are central to the ways scientists conceptualize both the methods of inquiry and models of nature. Restrained but clear echoes still appear even in a text that is clearly trying to keep science "buttoned up": "The laws of nature are not apparent in our everyday surroundings, waiting to be plucked like fruit from a tree. They are hidden and unyielding, and the difficulties of grasping them add greatly to the satisfaction of success."[34] Such metaphors and gender meanings of scientific methods, theories and objects of knowledge rescientize sex stereotypes as they simultaneously generate distortions of nature and inquiry.

These criticisms raise a number of important issues.[35] For one thing, it is important to see that the focus should not be on whether individuals in the history of science were sexist. Most of them were; in this they were like most men (and many women) of their day. Instead, the point is that the sexual meanings of nature and inquiry are used to express the anxieties of whole societies—or, at least, of the groups whose interests science was intended to advance. Cultural meanings, not individual ones, should be the issue here. Appeals to familiar sexual politics are used to allay anxieties about perceived threats to the social order.[36]

Moreover, the interactionist theories of metaphor that have been developed in the last few decades make clear that these metaphors are not merely heuristic devices or literary embellishments that can be replaced by value-neutral referential terms. They are a substantive part of science in that they show scientists how to extend the domains of

33. Richard Feynman, *The Feynman Lectures in Physics* (Reading, Mass: Addison-Wesley, 1964). See Sandra Harding, *The Science Question in Feminism* (Ithaca: Cornell University Press, 1986), chap. 5, for further discussion of these metaphors.

34. National Academy of Sciences, *On Being a Scientist*, 6.

35. See Harding, *The Science Question in Feminism*, 233–39.

36. See Merchant, *Death of Nature;* and Susan Bordo, *The Flight to Objectivity* (Albany: State University of New York Press, 1987).

their theories, what regularities of nature they should expect to find, what questions about nature to ask.[37]

These sexist meanings are politically and morally obnoxious. But they also distort our understandings of nature in two ways. For one thing, if scientists tend to select (intentionally or not) certain kinds of methods of inquiry *because,* among other reasons, they are associated with distinctively masculine stereotypes—interventionist methods, for example—masculine stereotypes have become part of the *evidence* for the results of this research. Since we should be able to weigh all the evidence for a scientist's claims, this preference for certain methods on the grounds that they carry masculine meanings or avoid feminine ones should be presented as part of the evidence. (Imagine such a research report in a scientific journal!)[38]

One consequence of the prevalence of this sort of preference is that scientists become less able to understand those aspects of nature that are not detectable through such methods and models. For instance, if Barbara McClintock's noninterventionist observation of patterns of growth in corn is associated with distinctively nonmasculine styles of interaction, it will be less used and appreciated by people who overvalue masculinity and devalue femininity.[39] In the second place, partiality for macho approaches to nature can also distort explanations. If hierarchical models of causation and control are associated with desirable masculine personality traits, the less hierarchical aspects of nature will be harder to detect, because they are not given reality, made visible, by the preferred hierarchical model. For example, in studies of slime mold aggregation, the imposition of such hierarchical causal notions as that of a pacemaker has made it difficult to see the interactive aspects of these processes.[40] Emily Martin has pointed out that modern Western medicine regards the female body as a kind of factory that derives its fundamental value from the quantity and quality of its products—that is, babies; once this factory is no longer able to manufacture these products, it is conceptualized as obsolete, useless. This

37. Mary Hesse, *Models and Metaphors in Science* (Notre Dame, Ind.: University of Notre Dame Press, 1966).

38. For an illuminating discussion of how social and cultural values shape evidence, see Helen Longino, *Science as Social Knowledge: Values and Objectivity in Scientific Inquiry* (Princeton, N.J.: Princeton University Press, 1990).

39. See, e.g., Keller, *Reflections,* chap. 9.

40. Ibid., chap. 8.

metaphoric view builds in both capitalist and androcentric values. It reduces women to their reproductive functions, and it makes difficult any understanding of female bodies as capable any other kinds of contributions to the social order, let alone any other uses or values *for* women themselves.[41]

Should we want these metaphors eliminated from science? Where possible, this would clearly appear to be desirable. But because these metaphors have become attractive in scientific work as a result of their social uses outside science, eliminating them from the language of science can be only part of the solution to the problem of how to degender the natural sciences. Doing so cannot in itself end the practice of drawing upon social meanings in the direction of research. Moreover, it raises the issue of how one should evaluate obviously sexist metaphors that have, nevertheless, contributed to the growth of scientific knowledge. How should feminism analyze, for instance, the fact that mechanistic metaphors drew on misogynous politics as a resource for the development of science?

In a certain sense, these are the wrong questions. Obviously, the sexist language of science is continuous with sexist thought in society in general. All thought and language both shapes and is shaped by the social order, its projects, and attempts to resolve conflicts within it. So solutions to this problem cannot be independent of more general struggles to end the subjection of women, racial "minorities," and the poor and to transform sciences into knowledge-seeking institutions *of, by,* and *for* these groups. We need to ask how to create the kinds of societies in which the dominant institutions of knowledge production are no longer so complicitous in benefiting the few to the detriment of the many. This critique is especially important however, because it shows that physics, chemistry, and abstract thought in every realm (including philosophy) can be deeply sexist or androcentric even when no humans at all appear in their domain of inquiry. Evidently, abstract thought is not quite as abstract as most have assumed. Perhaps even excessive preferences for the abstract themselves undercut the point of abstraction: these preferences, like all others, can be historically located.

41. Emily Martin, *The Women in the Body* (Boston: Beacon Press, 1987).

Someone has to do such politics for these benefits to science to accrue, but that someone doesn't have to be a scientist. Feminism appears available as a discourse and as an identity to people of good intentions if they open their minds to what the women's movement reveals to us all; if they get rid of their superstitions, ignorance, and prejudices; and, of course, if they have a humane attitude toward the disadvantaged and participate when asked in attempts to gain justice for them. Feminist science here is no more than the science that such people—men and women—already do. And in the case of physics, chemistry, and parts of biology, it hardly seems worthwhile to attach the label "feminist" to the science done in the presence of a women's movement. Maybe physicists will have to speak up on equity issues and watch their language a little more carefully to avoid offensive sexist metaphors. But nothing fundamental to how description and explanation of the natural world are produced will be done differently from the ways in which sciences are practiced when no women's movement is around. I am not arguing that Millman and Kanter would, in fact, make these claims but only that the unconsciously held but widespread theory of science that their passage echoes implies these claims.

Feminist Theory about Science as a Scientific Resource

Finally, what do the critics of bad science have to say about the role of social theories of science as a resource *for* science? Very little. If pressed, these thinkers tend to be reluctant to own that they have a theory of science at all. The excessively empiricist theory of science that they draw on presents scientific research as following a formula or algorithm. "For my way of discovering sciences goes far to level men's wits, and leaves but little to individual excellence because it performs everything by surest rules and demonstrations," says Bacon of his method.[15] Doing good science requires little reflection on how hypotheses come to be proposed or considered appropriate for testing, let alone on how social forces might make *positive* contributions to the growth of knowledge. This position goes back to Newton's refusal to admit that he even made hypotheses: "I frame no hypotheses; . . . hypotheses, whether metaphysical or physical, whether of occult

15. Quoted in Van den Daele, "Social Construction of Science," 34.

qualities or mechanical, have no place in experimental philosophy."[16] This position holds that the products of the mind (in contrast to the products of "nature") constitute obstacles for science; hypotheses and theories, like all products of the mind, should be regarded with suspicion.

Supporting these views is the assumption, widespread in the sciences and in philosophy, that while false beliefs often require social explanations, true beliefs are the consequence only of natural processes. Hence the "spoiled vision" of the townspeople deserves an explanation that refers to the social causes of the "spoiling," but the "unspoiled vision" of the child can be explained entirely with reference to natural causes: he is a child. Recently, this assumption has been the target of criticism from the "strong programme" in the sociology of knowledge, whose proponents call for causally symmetrical accounts of both true and false, legitimate and illegitimate beliefs. Otherwise, these sociologists point out, the sociology of knowledge is really only the sociology of error or of people legitimated as knowers.[17] The critics of bad science appear ambivalent about whether the explanations of the results of good science research should or should not refer to social causes, but (my point here) they do not think it important to doing good science to have a distinctive social theory of how to do good science. For example, they do not give their implicitly held theory of science a name.[18]

The Millman and Kanter passage quoted above is the closest to a statement of the benefits feminist social theory can bring to science that I have found in this literature. Presumably, its authors would say not just that movements of social liberation enlarge the vision available to science, whether or not scientists realize it, but also that the *understanding* of the positive effect of such social values on the growth of knowledge—an understanding advanced by the very fact that they write this passage—should be useful to science. To say this clearly,

16. Isaac Newton, *Mathematical Principles of Natural Philosophy* (1687), quoted in *Science: Men, Methods, Goals,* ed. Baruch A. Brody and Nicholas Capaldi (New York: W. A. Benjamin, 1968), 78.

17. See David Bloor, *Knowledge and Social Imagery* (London: Routledge & Kegan Paul, 1977). This sociology of science is flawed, as I explain later, but illuminating nevertheless.

18. Bhaskar, *Reclaiming Reality,* points out that the astounding flexibility and adaptiveness of this theory of science is dependent on its adherents' refusal to acknowledge that there is any theory of science in play at all.

however, is to challenge directly and deeply the positivist grounds of the sciences' excessively empiricist theory of science.[19] Either scientific method in fact leaves a great deal to the "wit and imagination," or else scientific method should be taken to include processes of deciding how we should shape the entire moral and political order. In Millman and Kanter's passage there is, as I have noted, an unselfconsciousness about the paradoxical way the parts of their statement fit together. Is it really an "unspoiled vision" that the women's movement brings, not one shaped by interests in improving women's condition? Are there no interests, no desired benefits to men as men—whether or not consciously intended—that might account for the "covers and blinders" over women's as well as men's eyes? Did we all really "persuade ourselves" of the truth of the partial and distorted sexist vision of the world? Why haven't our lives improved as rapidly as the story about the townspeople would predict? Women's movements have been removing covers and blinders from eyes in the West at least since Christine de Pisan wrote *The City of Ladies* in the fifteenth century, yet we still live in a world ruled by powerful old naked patriarchal emperors.

I make these comments not as a criticism of Millman and Kanter, for I think I would have said much the same thing to the audience they were addressing. (In fact, I hear criticisms of bad science not very different from theirs emerging from my very own lips when I am initially presenting feminist materials to audiences that I judge to be friendly to conventional views of science but hostile to what they consider feminism.) Rather, I make these points to indicate how difficult it is for feminists to maintain a theory of science that is coherent with the sciences' own visions of themselves. The attempt to explain within such constraints the resources that the women's movement generates for the growth of scientific knowledge reveals the flaws in the paternal discourse.

The critics of bad science appear to be caught between two loyalties. On the one hand, they try to respect the dogma that one can explain "good science" without referring to its social causes. On the other hand, they think that the women's movement *is* a social cause of better science and that an understanding of *why* it is should inform scientific practice at least to the extent that scientists should welcome the women's movement and listen to what it says in order to increase the growth of knowledge.

19. A reminder to colleagues in the natural sciences: what is at issue here is a philosophy, a theory, of the history and practice of science known as empiricism, not the desirability of empirical research.

Criticisms of Science-as-Usual

How Women Scientists Benefit Science

The logic of the Marxist theory of science, from which the criticisms of science-as-usual borrow, does not lead to advocating the advancement of women in the existing scientific enterprise if that means leaving science otherwise unchanged. From this perspective, at best it makes no difference at all to women's situation in general if women are added to the social structure of a science that appears to be so thoroughly integrated with the misogynist, racist, and bourgeois aspects of the larger society. More likely it is a bad thing, since it diverts women's attention and energies from struggles against the *sources* of male domination and adds their energies to science's misogynist, racist, and bourgeois tendencies (whether or not these are intended by individual scientists).

Moreover, adding women to an institution that is highly stratified by class and race as well as by gender has the effect of strengthening class and race divisions between women. Women at the top of race and class hierarchies who succeed in science tend not to criticize or work against those forms of domination that oppress their sisters in other classes and races; they can easily become mere tokens whose individual achievement has little or no positive effect on the situation of the women who are not so favored. This is not to say that these women have not had to struggle mightily and unfairly to achieve the credentials and positions that flow so much more routinely to their male colleagues, nor is it to say that they intend such consequences. Nevertheless, it is frequently the case that their hard-won success does not significantly improve the situation for other women. It may sometimes even prove detrimental: if hiring or promoting a few (compliant) members of a protected class satisfies the watchdogs of affirmative action, the hiring of other highly qualified members of those classes can be more effectively resisted. Successful (and unsuccessful) women who say "I've never experienced sexism" invariably have done nothing to challenge what was expected of them as women. They have not taken the risks