

The Science Question in Feminism

SHOULD THE HISTORY AND PHILOSOPHY OF SCIENCE BE X-RATED?

This question¹ is only slightly antic once we look at the metaphors and models of gender politics with which scientists and philosophers of science have explained how we all should think about nature and inquiry. Examples of gender symbolization generally occur in the margins, in the asides, of texts—in those places where speakers reveal the assumptions they think they do not need to defend, beliefs they expect to share with their audiences. We will see assumptions that the audiences for these texts are men, that scientists and philosophers are men, and that the best scientific activity and philosophic thinking about science are to be modeled on men's most misogynous relationships to women—rape, torture, choosing “mistresses,” thinking of mature women as good for nothing but mothering. Let us look first at some striking examples from the history of science, and then examine some comments by contemporary scientists and philosophers.

Historical Images.

Contemporary science presents its conceptions of nature and inquiry as truths discovered at the birth of modern science—as objective, universally valid reflections of *the* way nature is and *the* way to arrive at mirrorlike descriptions and explanations. But historians point out that conceptions of nature and inquiry have changed over time, and that they have been highly influenced by the political strategies used in historically identifiable battles between the genders. Gender politics has provided resources for the advancement of science, and science has provided resources for the advancement of masculine domination. I raised this issue earlier in asking whether it could possibly be reasonable to regard as a pure coincidence the development of sexology hot on the heels of the nineteenth-century women's movement.

We should note at the start that there are a number of problems with these historical studies. One origin of these problems is the mystifying philosophy of social science directing them, especially the misleading understandings of the complete “life history” of the role of metaphor in scientific explanation. Another origin is the inadequacy of histories which say little about social relations between the genders,

¹My apologies to Stephen Brush, whose paper, “Should the History of Science Be X-Rated?” in *Science* 183(no.4130) (1974) did not deal with the gender behavior of scientists (or philosophers).

let alone about how changes in these relations were experienced, perceived, and responded to by the culture in general, including the scientific thinkers of the day. We can see that the five substantive problems with the conceptual schemes of the social sciences pointed out by feminist critics (see Chapter 4) infest the source materials available to historians today. In spite of such shortcomings, these studies greatly advance our understanding of science's place in its social worlds.

One phenomenon feminist historians have focused on is the rape and torture metaphors in the writings of Sir Francis Bacon and others (e.g., Machiavelli) enthusiastic about the new scientific method. Traditional historians and philosophers have said that these metaphors are irrelevant to the *real* meanings and referents of scientific concepts held by those who used them and by the public for whom they wrote. But when it comes to regarding nature as a machine, they have quite a different analysis: here, we are told, the metaphor provides the interpretations of Newton's mathematical laws: it directs inquirers to fruitful ways to apply his theory and suggests the appropriate methods of inquiry and the kind of metaphysics the new theory supports.² But if we are to believe that mechanistic metaphors were a fundamental component of the explanations the new science provided, why should we believe that the gender metaphors were not? A consistent analysis would lead to the conclusion that understanding nature as a woman indifferent to or even welcoming rape was equally fundamental to the interpretations of these new conceptions of nature and inquiry. Presumably these metaphors, too, had fruitful pragmatic, methodological, and metaphysical consequences for science. In that case, why is it not as illuminating and honest to refer to Newton's laws as "Newton's rape manual" as it is to call them "Newton's mechanics"?

We can now see that metaphors of gender politics were used to make morally and politically attractive the new conceptions of nature and inquiry required by experimental method and the emerging technologies of the period. The organicist conception of nature popular in the medieval period—nature as alive, as part of God's domain—was appropriate neither for the new experimental methods of science nor for the new technological applications of the results of inquiry. Carolyn Merchant identifies five changes in social thought and experience in Europe during the fifteenth to seventeenth centuries that contributed

²See, e.g., the philosophers and scientists criticized in Hesse (1966).

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to the distinctive gender symbolism of the subsequent scientific world view.³

First of all, when Copernican theory replaced the earth-centered universe with a sun-centered universe, it also replaced a woman-centered universe with a man-centered one. For Renaissance and earlier thought within an organic conception of nature, the sun was associated with manliness and the earth with two opposing aspects of womanliness. Nature, and especially the earth, was identified on the one hand with a nurturing mother—"a kindly, beneficent female who provided for the needs of mankind in an ordered, planned universe"—and on the other with the "wild and uncontrollable [female] nature that could render violence, storms, droughts, and general chaos" (p. 2). In the new Copernican theory, the womanly earth, which had been God's special creation for man's nurturance, became just one tiny, externally moved planet circling in an insignificant orbit around the masculine sun.

Second, for the Platonic organicism, active power in the universe was associated with the alive, nurturing mother earth; for the Aristotelian organicism, activity was associated with masculinity and passivity with womanliness. Central to Aristotle's biological theory, this association was revived in sixteenth-century views of the cosmos, where "the marriage and impregnation of the 'material' female earth by the higher 'immaterial' celestial masculine heavens was a stock description of biological generation in nature." Copernicus himself draws on this metaphor: "Meanwhile, the earth conceives by the sun and becomes pregnant with annual offspring" (p. 7). Resistance to this shift in the social meaning of womanliness is evident in the sixteenth-century conflicts over whether it was morally proper to treat mother earth in the new ways called for by such commercial activities as mining. But as the experience of "violating the body" of earth became increasingly more common during the rise of modern science and its technologies, the moral sanctions against such activities provided by the older organic view slowly died away. Simultaneously, a criterion for distinguishing the animate from the inanimate was being created. (This distinction is a theoretical construct of modern science, not an observational given familiar to people before the emergence of science. And, as we shall see, it is one that increasingly ceases to reflect "common sense.") Thus

³Merchant (1980). Subsequent page references to this work (and the authors cited within it) appear in the text.

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a “womanly” earth must be only passive, inert matter and indifferent to explorations and exploitations of her insides.

Third, the new universe that science disclosed was one in which change—associated with “corruption,” decay, and disorder—occurred not just on earth, as the Ptolemaic “two-world view” held, but also throughout the heavens. For Renaissance and Elizabethan writers, these discoveries of change in the heavens suggested that nature’s order might break down, leaving man’s fate in chaos (p. 128). Thinkers of the period consistently perceived unruly, wild nature as rising up against man’s attempts to control his fate. Machiavelli appealed to sexual metaphors in his proposition that the potential violence of fate could be mastered: “Fortune is a woman and it is necessary if you wish to master her to conquer her by force; and it can be seen that she lets herself be overcome by the bold rather than by those who proceed coldly, and therefore like a woman, she is always a friend to the young because they are less cautious, fiercer, and master her with greater audacity” (p. 130).

Fourth, man’s fate seemed difficult to control because of disorder not only in the physical universe but also in social life. The breakdown of the ancient order of feudal society brought the experience of widespread social disorder during the period in which the scientific world view was developing. Particularly interesting is the possibility that women’s increased visibility in public life during this period was perceived as threatening deep and widespread changes in social relations between the genders. Women were active in the Protestant reform movements of northern Europe, and Elizabeth I occupied England’s throne for an unprecedentedly long reign. Prepared by the organic view’s association of wild and violent nature with one aspect of the womanly, and by the absence of clear distinctions between the physical and the social, the Renaissance imagination required no great leap to associate all disorder, natural and social, with women. By the end of the fifteenth century, this association had been fully articulated in the witchcraft doctrines. To women was attributed a “method of revenge and control that could be used by persons both physically and socially powerless in a world believed by nearly everyone to be animate and organismic” (p. 140).

Fifth, the political and legal metaphors of scientific method originated at least in part in the witchcraft trials of Bacon’s day. Bacon’s mentor was James I of England, a strong supporter of antifeminist and antiwitchcraft legislation in both England and Scotland. An obsessive

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focus in the interrogations of alleged witches was their sexual practices, the purpose of various tortures being to reveal whether they had “carnally known” the Devil. In a passage addressed to his monarch, Bacon uses bold sexual imagery to explain key features of the experimental method as the inquisition of nature: “For you have but to follow and as it were hound nature in her wanderings, and you will be able when you like to lead and drive her afterward 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—as your majesty has shown in your own example” (p. 168). It might not be immediately obvious to the modern reader that this is Bacon’s way of explaining the necessity of aggressive and controlled experiments in order to make the results of research replicable!

As I indicated earlier, this kind of analysis raises a number of problems and challenges, some of which we shall examine further in later chapters. There does, however, appear to be reason to be concerned about the intellectual, moral, and political structures of modern science when we think about how, from its very beginning, misogynous and defensive gender politics and the abstraction we think of as scientific method have provided resources for each other. The severe testing of hypotheses through controlled manipulations of nature, and the necessity of such controlled manipulations if experiments are to be repeatable, are here formulated by the father of scientific method in clearly sexist metaphors. Both nature and inquiry appear conceptualized in ways modeled on rape and torture—on men’s most violent and misogynous relationships to women—and this modeling is advanced as a reason to value science. It is certainly difficult to imagine women as an enthusiastic audience for these interpretations of the new scientific method.

If appeal to gender politics provides resources for science, does appeal to science provide resources for gender politics? Do not metaphors illuminate in both directions? As nature came to seem more like a machine, did not machines come to seem more natural? As nature came to seem more like a woman whom it is appropriate to rape and torture than like a nurturing mother, did rape and torture come to seem a more natural relation of men to women? Could the uses of science to create ecological disaster, support militarism, turn human labor into physically and mentally mutilating work, develop ways of controlling “others”—the colonized, women, the poor—be just misuses of applied science? Or does this kind of conceptualization of the char-

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acter and purposes of experimental method ensure that what is called bad science or misused science will be a distinctively masculinist science-as-usual? Institutions, like individuals, often act out the repressed and unresolved dilemmas of their infancies. To what extent is the insistence by science today on a value-neutral, dispassionate objectivity in the service of progressive social relations an attempt by a guilty conscience to resolve some of these early but still living dilemmas?

The history of biology and medicine reveal similarly striking uses of gender symbolism to reconceptualize nature—a project that naturalized gender politics as it genderized biology and medicine. L. J. Jordanova's study of eighteenth- and nineteenth-century biomedical science in France and Britain found that "sex roles were constituted in a scientific and medical language, and, conversely, the natural sciences and medicine were suffused with sexual imagery."⁴ Science and medicine were fundamental to the Enlightenment writers' critical examination of social organization in three ways:

First, natural philosophers and medical writers addressed themselves to phenomena in the natural world such as reproduction and generation, sexual behaviour, and sex-related diseases. Second, science and medicine held a privileged position because their methods appeared to be the only ones which would lead away from religious orthodoxy and towards a secular, empirically based knowledge of the natural and social worlds. Finally . . . science and medicine as activities were associated with sexual metaphors which were clearly expressed in designating nature as a woman to be unveiled, unclothed and penetrated by masculine science. [p. 45]

Consciously or unconsciously, Enlightenment thinkers refused to detach women's and men's social roles from the description and depiction of physiological differences. One striking and influential expression of this socialized biomedicine appears in the wax models of human figures used for making anatomical drawings and for educational display in popular museums.

The female figures are recumbent, frequently adorned with pearl necklaces. They have long hair, and occasionally they have hair in the pubic area also. These "Venuses" as they were significantly called lie on velvet or silk cushions, in a passive, almost sexually inviting pose. Comparable male figures are usually upright, and often in a position of motion. The

⁴Jordanova (1980, 42). Subsequent page references to this essay appear in the text.

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female models can be opened to display the removable viscera, and most often contain a foetus, while the male ones are made in a variety of forms to display the different physiological systems. . . . Not only is the literal naturalness of women portrayed, in their total nakedness and by the presence of a foetus, but their symbolic naturalness is implied in the whole conception of such figures. Female nature had been unclothed by male science, making her understandable under general scrutiny. [p. 54]

This image “was made explicit in the statue in the Paris medical faculty of a young woman, her breasts bare, her head slightly bowed beneath the veil she is taking off, which bears the inscription ‘Nature unveils herself before Science’ ” (p. 54). Anatomically, males were depicted as representing active agents of our species, females as the objects of human (masculine) agency. Women’s bodies were simultaneously presented as objects of scientific curiosity and as objects of (socially constructed) sexual desire.

Particularly interesting is the fact that women’s social and occupational roles during the period were very diverse, not limited to those prescribed by the stereotypes. Everyone would have experienced this diversity in women’s activities—including medical and scientific men of the period—so it cannot be that such gender symbolism was simply a passive reflection of an existing division of labor by gender in the social world around them. Instead, “the lack of fit between ideas and experience clearly points to the ideological function of the nature/culture dichotomy as applied to gender. This ideological message was increasingly conveyed in the language of medicine” (p. 42). Thus biomedical science intensified the cultural association of nature with passive, objectified femininity and of culture with active, objectifying masculinity—and was in return more intensely masculinized by this project.

Examination of more recent periods of escalating appeal to gender politics suggests that the intensified expressions of misogyny in the sciences of earlier periods were not representations of a free-floating overt misogyny that had the good fortune to encounter a resource in emerging scientific projects of the day; more likely, fundamental social changes between the genders were occurring or threatening to occur. Overt misogynous expression is best thought of as masculine protest literature; after all, one does not bother to state what is obvious or to agitate for something one already has. From this perspective, the relative lack of overt misogynous expression in other historical periods

cannot be taken as a simple indicator of equality between the sexes (although a great deal more equality has existed at other times and places than in the last few centuries of Western life); rather, the lack of male protest often accompanies the relatively stable powerlessness of women and should therefore be taken as an indication of men's "distance from the problem."⁵

Contemporary Images.

The regendering of nature and inquiry was not a project only of the comfortably distant centuries. Prodigious energies have been put into projects of this sort right up through the present day.⁶ Many commentators have suggested that notions familiar in popular and scholarly discussions of science are at least subliminally drawing on gender symbols. Common examples are such dichotomies as "hard" and "soft" data, the "rigor" of the natural science vs. the "softness" of social

⁵This kind of analysis can also be used to illuminate the reasons for different levels of overt sexism in the different strata of contemporary society. The model of the sexist projected by much social science research, as well as by such cultural figures as the male chauvinist or machismo latino, is a working-class person who overtly expresses his hostility to women and his ignorance about them; in comparison, the middle class, to which most social scientists themselves belong, appears relatively unprejudiced and tolerant. Yet it is not latinos and working-class men who design and direct the institutions that maintain the subjugation of women. Class stratification of overt sexism is better understood as a function of two other phenomena. In the first place, middle-class people are increasingly taught not to express sexism overtly. More important, men already established in the elite strata of the government and the professions are not personally threatened by affirmative action directives, and they can afford alimony and child support (even if they resent it). Working-class men and men in entry-level professional jobs feel the effect of attempts to gain equality for women far more than do the elite. Thus not only is "tolerance" taught to the middle class; it is a luxury they can afford. In making these points I am indebted to David Wellman's analysis of class variability in expressions of racism in "Prejudiced People Are Not the Only Racists in America" (1977, ch.1). Wellman's work is also valuable for its insistence that racism is fundamentally a structural feature of societies, which in turn produce racist "prejudices" as defensive attempts to "explain" the easily perceived gap between democratic ideology and the realities of racial stratification. This is the kind of analysis feminists should make of sexism. It should occasion feminist thinking about racism within feminism; moreover, it would predict an *increase* in sexist attitudes (even if not always overtly expressed) as the women's movement brings increased public awareness of the contradiction between gender stratification and our "democratic" ideals. The notion of a masculine "backlash," which is often invoked to account for the apparent recent escalation of pornography, rape, incest, wife-battering, and other overt expressions of hostility, is on the right track but not quite complex enough to capture the social dynamic that Wellman's account suggests. The feminist debate over pornography especially could benefit from this kind of analysis: pornography is a *solution* to some men's dilemmas, not a cause of them.

⁶Fee (1980); Hall (1973-74); Griffin (1978); Keller (1984); Bloch and Bloch (1980).

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science, reason and intuition, mind and matter, nature and culture, and so forth, as well as familiar appeals to the “penetrating thrust of an argument,” “seminal ideas,” and the like. But let us take a look at some more extended and conscientious efforts at gender symbolism.

Consider the following conclusion to a recent Nobel Lecture where the laureate, a physicist, is summing up the history of his prizewinning work:

That was the beginning, the idea seemed so obvious to me and so elegant that I fell deeply in love with it. And, like falling in love with a woman, it is only possible if you do not know much about her, so you cannot see her faults. The faults will become apparent later, but after the love is strong enough to hold you to her. So, I was held to this theory, in spite of all difficulties, by my youthful enthusiasm. . . . So what happened to the old theory that I fell in love with as a youth? Well, I would say it's become an old lady, who has very little that's attractive left in her, and the young today will 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 Science for complimenting one of them.⁷

And here is the closing passage of a widely cited paper by an eminent contemporary philosopher of science; the author, Paul Feyerabend, is explaining why his proposal for a rational reconstruction of the history of science is preferable to Karl Popper's: “Such a development, far from being undesirable, 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 do not think I need to explain my own preferences.”⁸ The two passages present two cultural images of manliness: the good husband and father, and the sexually competitive, locker-room jock.

Even the position in the texts of these contemporary moral appeals to gender politics is illuminating. Each occurs as the final statement—as the summary thoughts the audience/readers are to take away with them. In case they hadn't noticed the reinforcement to masculinity of

⁷Richard Feynman, *The Feynman Lectures in Physics* (Reading, Mass.: Addison-Wesley, 1964), cited in Trawick (1986).

⁸Paul Feyerabend, “Consolations for the Specialist,” in Lakatos and Musgrave (1970, 229).

the “purely cognitive” claims, each author drives his point home in his final message. The scientist and the philosopher are, indeed, men (in spite of their successes in cerebral careers? do men, too, fear certain kinds of success?); the audience likewise. Their partners—science and its theories—are exploitable women. A proposal should be appreciated *because* it replicates gender politics.

Evelyn Fox Keller points out that it is not just a few scientists and philosophers who project a defensive masculinity onto their activities. Even though the scientist is perceived as supermasculine, he is also thought to be less sexual than men in certain other occupations. A study of English schoolboys for instance reveals the following set of attitudes: “The arts are associated with sexual pleasure, the sciences with sexual restraint. The arts man is seen as having a good-looking, well-dressed wife with whom he enjoys a warm sexual relation; the scientist as having a wife who is dowdy and dull, and in whom he has no physical interest. Yet the scientist is seen as masculine, the arts specialist as slightly feminine.”⁹ Keller notes that the perception of science as “antithetical to Eros” is related to the perception of science as a supermasculine activity, and that both images can be found in early thinkers: “‘Let us establish a chaste and lawful marriage between Mind and Nature,’ Bacon writes, thereby providing the prescription for the birth of new science. This prescription has endured to the present day—in it are to be found important clues for an understanding of the posture of the virgin groom, of his relation toward his bride, and of the ways in which he defines his mission.”¹⁰

Keller argues that it is in the association of competence with mastery and power, of mastery and power with masculinity, and of this constellation with science that the intellectual structures, ethics, and politics of science take on their distinctive androcentrism. Such images simultaneously construct the institutionalized ethos of gendered sexuality and of science and, consequently, of the practices structured by these institutions. Science reaffirms its masculine-dominant practices and masculine dominance its purportedly objective scientific rationale through continual mutual support. Not only is this set of associations objectionable because it is sexist; it also makes bad science. It leads to false and oversimplified models of nature and inquiry that attribute power relations and hierarchical structure where none do or need exist.

⁹L. Hudson, *The Cult of the Fact* (New York: Harper & Row, 1972), p. 83, cited in Keller (1978, 189).

¹⁰Keller (1978, 190).

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Keller sees alternative images and practices within the history of science that are respectful of nature's own complexity, not so closely tied to distinctively masculine identity projects, and more androgynous: "We need not rely on our imagination for a vision of what a different science—a science less restrained by the impulse to dominate—might be like. Rather, we need only look to the thematic pluralism in the history of our own science as it has evolved."¹¹ Keller points to many non-macho elements in the history of science. One of the themes of her intellectual biography of Barbara McClintock is the transcendence of gender in McClintock's scientific problematic, concepts and theory, and methods of research. McClintock's "feeling for the organism," her respect for the complexity of difference between individuals, her need to "listen to the material" all exemplify non-masculine tendencies that can also be detected elsewhere in the history of science. McClintock's work does not provide a feminist science, Keller argues, exactly because it transcends gender (though McClintock may have been more easily led to a deviant formulation of molecular biology, Keller speculates, because of her own status as a woman, as an outsider, a deviant, within science).¹²

But here Keller mistakenly identifies feminism with the exaltation of feminine identity projects, rather than with exactly that transcendence of gender. While some feminists have engaged in a kind of "reverse discrimination" here, the majority have been critical of such tendencies.¹³ Furthermore, Keller replicates traditional internalist history in stressing pluralism in the intellectual history of science while ignoring the social, political, psychological, and economic constraints that explain why some scientific ideas gain social legitimacy and others do not. There are social as well as intellectual reasons why "master molecule" theories gain ascendancy at one moment in history and interactive models at another. While these criticisms name real challenges for Keller's kind of account, they are certainly not peculiar to her approach to these issues. And it is difficult to imagine what could constitute evidence against her claim that notions of mastery and competence, masculinity, and science stand in mutually supportive relationships that are detrimental both to science and to women. (And, we might add, to men, who are asked to fulfill a demanding and distorting set of prescriptions for achieving maturity.)

¹¹Keller (1982, 602).

¹²Keller (1983).

¹³Fee (1984).

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Merchant, Jordanova, and Keller join a series of others who have focused on the conceptual dichotomizing central to scientific ideology and practice. Is this tendency itself a distinctively masculine one? Some critics argue that its roots are to be found in Judaism and Christianity, capitalism and colonialism, the European culture of the fifteenth through seventeenth centuries and its liberal political theory. Chapter 7 examines problems with the way feminists have conceptualized these dichotomies, but let us look now at what they have to say about them.

Like Merchant, Jordanova, and Keller, Elizabeth Fee argues that such dichotomies are distinctively masculine. She points out that while they can be detected in the ideology of gender in modern liberal philosophy, they must have far older roots, since they are evident in the entire history of Western philosophy.

The construction of our political philosophy and views of human nature seem to depend on a series of sexual dichotomies involved in the construction of gender differences. We thus construct rationality in opposition to emotionality, objectivity in opposition to subjectivity, culture in opposition to nature, the public realm in opposition to the private realm. Whether we read Kant, Rousseau, Hegel, or Darwin, we find that female and male are contrasted in terms of opposing characters: women love beauty, men truth; women are passive, men active; women are emotional, men rational; women are selfless, men selfish—and so on and on through the history of western philosophy. Man is seen as the maker of history, but woman provides his connection with nature; she is the mediating force between man and nature, a reminder of his childhood, a reminder of the body, and a reminder of sexuality, passion, and human connectedness. She is the repository of emotional life and of all the nonrational elements of human experience. She is at times saintly and at times evil, but always she seems necessary as the counterpoint to man's self-definition as a being of pure rationality.¹⁴

Fee argues that the insistence on these masculinist dichotomies is crucial in four ways to the maintenance of the belief that science is objective. First, issues about the production of knowledge must be kept distinct from those about the social uses of knowledge lest scientists be forced to take responsibility for goals beyond the pursuit of

¹⁴Fee (1981, 11–12). See also Carol Gould's "The Woman Question: Philosophy of Liberation and the Liberation of Philosophy," Caroline Whitbeck's "Theories of Sex Differences," and Anne Dickason's "Anatomy and Destiny: The Role of Biology in Plato's Views of Women," all in Gould and Wartofsky (1976); Griffin (1978).

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knowledge for its own sake, and lest the public be encouraged to seek more power over the choice of what research is to be funded and who is to perform it.

Second, thinking and feeling must be kept separate lest scientific rationality be forced to respond to how people feel about the probable social consequences of their own or others' successful research on weapons, biomedical projects, and social control. "The roles of scientist and of citizen are distinct, and the scientist need feel socially responsible or emotionally involved only in her or his role as private citizen."¹⁵ Historians point out that this shift of the domain of morality to private life is a modern invention. For Aristotle and the Greeks, it was in *public* life that the highest exercise of morality could be achieved. Science has gained status through its paradigmatic role as the institution where this separation of rationality from social commitment is most effectively policed, while the spread of scientific rationality to all the institutions of modern life leaves science in the powerful position of enforcing this separation in other areas of social life.

Third, the scientific subject, the scientist, must be kept separate from the scientific object—what he or she studies. As Merchant and Jordanova pointed out, the knowing mind is active but the object of knowledge is passive. It is the scientific subject's voice that speaks with general and abstract authority; the objects of inquiry "speak" only in response to what scientists ask them, and they speak in the particular voice of their historically specific conditions and locations.

Fourth, science must be presented as separate from society precisely to obscure its intimate relationships to political power.

We are told that the production of scientific knowledge must be independent of politically motivated interference or direction. Yet we see scientists constantly testifying before congressional committees, we find scientists in law courts, and involved in disputes at every level of public policy. It is obvious that the experts take sides. It is also obvious that these "experts" are very often funded by corporate interests, and that there are few penalties for those who find that their research supports the positions of these powerful lobbies.¹⁶

Ruth Hubbard has also argued that this kind of dichotomizing reveals the intellectual, moral, and political projects of the science we

¹⁵Fee (1981, 18).

¹⁶Fee (1981, 19–20).

have to be sexist, classist, and racist.¹⁷ Hubbard stresses science as a social construction, a historical enterprise that tells stories about us and the world around us. As a biologist, she has focused on the historical stories a classist, racist, and masculine-dominant social order has chosen to tell about sex differences. In analyses whose topics range from the writings of Darwin and other eminent men of science through contemporary biology texts, she shows the sexist, classist, and racist political projects supported by the maintenance of these kinds of dichotomies in sex-difference research. She argues that the very focus on sex differences in the face of the incredible similarities between the sexes may itself be a reflection of distinctively masculine projects.

Mind vs. nature and the body, reason vs. emotion and social commitment, subject vs. object and objectivity vs. subjectivity, the abstract and general vs. the concrete and particular—in each case we are told that the former must dominate the latter lest human life be overwhelmed by irrational and alien forces, forces symbolized in science as the feminine. All these dichotomies play important roles in the intellectual structures of science, and all appear to be associated both historically and in contemporary psyches with distinctively masculine sexual and gender identity projects. In turn, gender and human sexuality have been shaped by the projects of this kind of science.

Our title question for this section should now appear less surprising. Should this history and philosophy of science be X-rated? The sexist meanings of scientific activity were evidently crucial resources through which modern science gained cultural acceptance; they remain the resources that contemporary scientists and philosophers use to justify and explain their activities. They also are used to attract young people (young men, presumably) into science and the philosophy of science. How can this be “socially progressive”? As historian Joan Kelly-Gadol asks, once we understand women’s situation to be as fully social as men’s, must we not reevaluate purportedly progressive movements in Western history for their impact on women as well as on men—for their impact on “her” humanity as well as “his”?¹⁸ Why should we regard the emergence of modern science as a great advance for humanity when it was achieved only at the cost of a deterioration in social status for half of humanity? Why should we regard the miso-

¹⁷Hubbard, Henifin, and Fried (1982); Hubbard (1979); Lowe and Hubbard (1983). Hubbard and Lowe are also listed as the editors for Tobach and Rosoff (1979), vol. 2 in the *Genes and Gender* series.

¹⁸Kelly-Gadol (1976).

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gynous arguments of contemporary Nobel laureates and eminent philosophers of science as irrelevant to the meanings science has for scientists and the general public—especially when we are asked to understand other kinds of metaphors in science as intrinsic to the “growth of knowledge”? It seems to me that the burden of proof of innocence in the advancement of misogyny belongs to the science enthusiasts, not to the victims of these genderized meanings.