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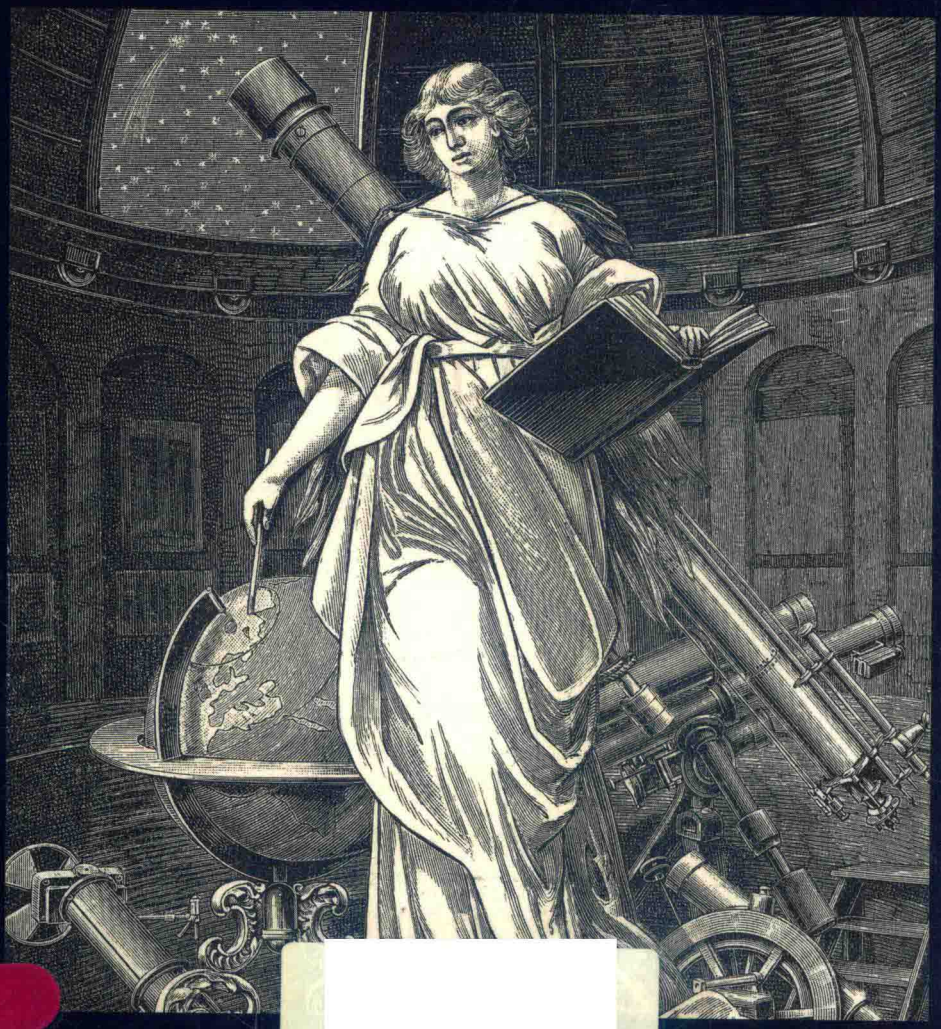
Philosophy of Science after Feminism



Janet A. Kourany

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To Jim, who suffered through the writing of this book
nearly as much as I did but did not have half the fun.
With unending thanks.

Preface

The goal of *Philosophy of Science after Feminism* is to provide the blueprint for a philosophy of science more socially engaged and socially responsible than the philosophy of science we have now, a philosophy of science that can help to promote a science more socially engaged and socially responsible than the science we have now. Feminists—feminist scientists and historians of science, as well as feminist philosophers of science—have already been pursuing this kind of philosophy of science in gender-related areas for three decades now. The strategy I adopt is to develop from their work a comprehensive new program of research for philosophy of science. How do I do this?

Chapter 1 introduces the kinds of normative questions regarding science feminists have been pursuing. These questions locate science within its wider societal context, investigating science's epistemic aspects as they are entangled with science's ethical, sociopolitical, and economic aspects. These questions are contrasted with the normative questions regarding science that mainstream philosophy of science currently pursues, the questions that investigate science's epistemic aspects in isolation from science's societal context.

Chapter 2 explores the twentieth-century roots of contemporary philosophy of science and its penchant for dealing with science as if science existed in a social/political/economic vacuum. It uncovers no defensible reasons, epistemic or otherwise, to indulge this penchant and many reasons not to. It also uncovers, in the early-twentieth-century work of the Vienna Circle, an important historical precedent for doing philosophy of science in a more socially connected way. A contemporary program for a "contextualized" philosophy of science inspired by the work of feminists might therefore be an attractive option.

Chapter 3 thus takes up the feminists' normative questions regarding science introduced in chapter 1 together with the various feminist science studies approaches they have engendered: the methodological approach rationalized by the ideal of value-free science, the social approach rationalized by the social-value-management ideal of science, and the naturalist approaches rationalized by the empiricist ideal of science. In the end, however, a new approach is found necessary: a political approach rationalized

by the ideal of socially responsible science. According to this approach, sound social values, as well as sound epistemic values, must control every aspect of the scientific research process, from the choice of research questions to the communication and application of results, this to be enforced by such political means as funding requirements on research.

Chapter 4 takes this approach beyond the gender contexts of chapters 1 and 3 and defends it against five important challenges: an epistemological challenge, an historical challenge, a sociological challenge, an economic challenge, and a political challenge.

Finally, chapter 5 deals with the fundamental issues that must be settled in order to apply this approach to all of science. The upshot is a research program for philosophy of science geared to the development of a new, more comprehensive understanding of scientific rationality, one that integrates the ethical with the epistemic, and the parallel development of a new, more socially valuable role for philosophers of science, that of public intellectuals.

Every author has a favorite place to write, a place where ideas seem to flow more easily or with greater warrant than they do in other places. My favorite place is the Zentrum für Interdisziplinäre Forschung (ZIF) at Bielefeld University in Germany. Parts of chapters 3 and 4 were written during the spring 2007 term while I was a fellow in the research group "Science in the Context of Application," and part of chapter 5 was written while I was a TransCoop resident fellow during June and July 2008. Chapter 4, in particular, would have been impossible without the weekly discussions and monthly workshops of the research group organized by Martin Carrier (Bielefeld University) and Alfred Nordmann (Technische Universität Darmstadt and University of South Carolina). Martin Carrier, Hans Glimell (University of Göteborg), and Torsten Wilholt (Bielefeld University), fellow members of the research group, were especially helpful. The University of Pittsburgh's Center for Philosophy of Science furnished another happy environment for writing parts of this book (in particular, parts of chapters 1 and 2 and a forerunner of chapter 3) in the spring term of 2004, when I was a visiting fellow there. I am grateful to the University of Notre Dame as well as Bielefeld's ZIF and Pittsburgh's Center for Philosophy of Science for research support during these times.

Every author also has a favorite person with whom to discuss her work, a person on whom she can try out ideas even at their earliest stages, when they are most in need of gentle treatment. My favorite person has been my partner, Jim Sterba. He has patiently and lovingly read the entire manuscript and given much shrewd advice. To him I dedicate this book. Our daughter, Sonya Kourany Sterba, now a budding quantitative psychologist, has also given freely of her time and insights. Whatever errors remain are mine alone.

Parts of what follows are based on previously published work. Some of the material in chapter 1 is drawn from "A Philosophy of Science for the

Twenty-First Century," *Philosophy of Science* 70, no. 1 (2003): 1–14; and from "A Feminist Primer for Philosophers of Science," in Christian Nimtz and Ansgar Beckermann, eds., *Philosophie und/als Wissenschaft* (Paderborn: Mentis, 2005), 287–305. The last part of chapter 2 is based on "Getting Philosophy of Science Socially Connected," *Philosophy of Science* 73, no. 5 (2006): 991–1002. Chapter 3 is a revised and expanded version of "Replacing the Ideal of Value-Free Science," in Martin Carrier, Don Howard, and Janet Kourany, eds., *The Challenge of the Social and the Pressure of Practice: Science and Values Revisited* (Pittsburgh: University of Pittsburgh Press, 2008), 87–111. And parts of chapter 5 draw on material from "Philosophy of Science: A Subject with a Great Future," *Philosophy of Science* 75, no. 5 (2008): 767–778. I am grateful to the Philosophy of Science Association, Mentis Publishers, the University of Chicago Press, and the University of Pittsburgh Press for permission to use this material. I am grateful also to Peter Ohlin, philosophy editor at Oxford University Press, and Cheshire Calhoun, series editor of Oxford's Studies in Feminist Philosophy, for their sustained interest and support of this project.

Contents

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A Feminist Primer for Philosophers of Science

- Women worldwide work more than men but earn less and have less job security, less job quality, fewer benefits, fewer assets, less control over family resources, and less control over household decision making. Even when they work full-time for pay outside the home, "the available evidence shows that, across regions, women's nominal wages are roughly 20% lower than men's" (UNICEF 2006)—in the United States in 2007, the figure was 78 cents for every dollar that men earned (National Women's Law Center 2009). At the same time, women still do the majority of housework, child care, and elder care (UNICEF 2006).
- In many countries there is a greater preference for male children than for female children. In China, South Korea, India, Pakistan, Bangladesh, Nepal, Egypt, Syria, Haiti, Colombia, Costa Rica, and many other countries, female babies and female fetuses are killed because they are of the "wrong" sex. In China in 2005, between 120 and 130 males were born for every 100 females, and in India, the number of "vanished" females has now reached 700,000. In addition, male children frequently receive better nutrition, health care, and support than female children. All of this prenatal and postnatal son selection is likely to have severe social consequences in coming years and may even produce a surge in sexual violence and trafficking of women (UN News Centre 2007; UN News Service 2008).
- "Violence against women and girls continues unabated in every continent, country and culture" and "is a problem of pandemic proportions. At least one out of every three women around the world has been beaten, coerced into sex, or otherwise abused in her lifetime" (UNIFEM 2007). What's more, "women are at greatest risk of violence from men they know. In Australia, Canada, Israel, South Africa and the United States, 40–70% of female murder victims were killed by their partners" (UNFPA 2005).

- While rape is an ever-present fear of women worldwide, most of the world's rape laws conceive of rape as an offense against *men*—either the fathers of unmarried women or the husbands of married ones. Similarly, in war, rape is regularly used by one side's soldiers as the ultimate humiliation and punishment of the men on the other side. "Violence against women during or after armed conflicts has been reported in every international or non-international war-zone, including Afghanistan, Burundi, Chad, Colombia, Cote d'Ivoire, Democratic Republic of the Congo, Liberia, Peru, Rwanda, Sierra Leone, Chechnya/Russian Federation, Darfur, Sudan, northern Uganda and the former Yugoslavia" (UNICEF 2006). In Rwanda, up to half a million women were raped during the 1994 genocide, up to 60,000 women were raped in the war in Croatia and Bosnia-Herzegovina, more than 32,000 cases of rape and sexual violence occurred between 2005 and 2006 in the Democratic Republic of Congo's South Kivu province alone, and so on (UNICEF 2006).

THE ROLE OF SCIENCE

After "three waves" of feminist activism in the United States and centuries of feminist thought and activism around the world, women are still not the social equals of men. The above items only begin to tell the story. Prostitution and pornography and the trafficking of women, female genital mutilation and honor killings, restrictions related to reproduction and gender socialization and sexual harassment, and more problems still need to be added to the above items to give a complete understanding of women's situation. Even so, the above items manage to convey some of the central problems women confront: that women the world over are thought inferior to men and, hence, deserving of inferior jobs, inferior wages, and inferior treatment both in the home and outside it.

Science can be a powerful ally in the struggle for equality for women. Science, after all, can expose society's prejudice against women for what it is, and science can both justify the replacement of this prejudice with a more adequate perspective and move society to accept the replacement. All too frequently, however, science has done more to perpetuate and add to the problems women confront than to solve them. For example, one of psychology's central messages, historically, has been that women are inferior to men—intellectually, socially, sexually, and even morally (Marecek 1995; Wilkinson 1997). And biology historically has set for itself the task of explaining the basis and origin of this inferiority in terms of what is largely unchangeable—biology. This has had the effect of justifying—and, thus, helping to perpetuate—women's inferior educational and employment opportunities, as well as women's inferior positions in the family, government, and other social institutions.

Consider women's intellectual capacity, for example. For centuries it was claimed that women are intellectually inferior to men, and for centuries the basis for such inferiority was sought in biology. In the seventeenth century, women's brains were claimed to be too "cold" and "soft" to sustain rigorous thought. In the late eighteenth century, the female cranial cavity was claimed to be too small to hold a powerful brain. In the late nineteenth century, the exercise of women's brains was claimed to be damaging to women's reproductive health—was claimed, in fact, to shrivel women's ovaries. In the twentieth century, the lesser "lateralization" (hemispheric specialization) of women's brains compared with men's was claimed to make women inferior in visuospatial skills (including mathematical skills) (Schiebinger 1989; Fausto-Sterling 1992, 2000). And now, in the beginning of the twenty-first century, the claims continue: that women's brains are smaller than men's brains, even correcting for differences of body mass; that women's brains have less white matter (axonal material); that women's brains have less focused cortical activity (lower "neural efficiency"); that women's brains have lower cortical processing speed (lower conduction velocity in their white matter's axons); and so on. And once again, these differences are being linked to differences in intellectual capacity: that people with smaller brains have lower IQ test scores; that less focused cortical activity is associated with lower intellectual performance; that lower cortical processing speed is associated with lower working-memory performance, which is correlated with lower "fluid intelligence" scores; and so on (see Hamilton 2008 for an up-to-date account). At the same time, much attention now focuses on the mappings of brain activity produced by brain imaging, particularly fMRIs (functional magnetic resonance imaging), and the differences in "emotional intelligence" these disclose. But once again, the "male brain," the "systemizer" brain, comes out on top—is the more scientific brain, the more innovative brain, the more leadership-oriented brain, the more potentially "elite" brain, than the "female brain," the "empathizer" brain (Karafyllis and Ulshofer 2008). And the biological research continues.

And so does the psychological research—the research whose results the biological research is intended to explain. Indeed, by one estimate more than 15,000 "human cognitive sex difference" studies were done between 1968 and 2008, more than 4,000 of them between 1998 and 2008 alone.[1] Of course, there are problems with many of these studies: they fail to report findings of no sex differences (nonsignificant findings), they fail to report the effect size of sex differences they do find, they fail to include replication samples to back up their initial findings, they assume a biological basis in the absence of biological data or cross-cultural data, and so on (Halpern 2000). No matter. Sweeping conclusions regarding cognitive sex

1. This estimate results from running a search on JSTOR of studies using the combination of words "human cognitive sex differences" on August 20, 2008. The exact numbers were 15,032 studies done between 1968 and 2008 and 4,038 between 1998 and 2008.

differences are drawn nonetheless. For example, one leading researcher in the field, Doreen Kimura, after reviewing this terrain of cognitive sex difference research, reports that

> we can say with certainty that there are substantial stable sex differences in cognitive functions like spatial rotation ability [favoring males], mathematical reasoning [favoring males], and verbal memory [favoring females]; and in motor skills requiring accurate targeting [favoring males] and finger dexterity [favoring females]. We can also state with certainty that most of these sexually differentiated functions are strongly influenced by early and/or current hormonal environments [ultimately linked to genetic and evolutionary factors]. (Kimura 2000b, 181; see also Kimura 2002b, 2004a)

The upshot: "It may turn out that the most objective, most appropriate and fairest criteria for admission to a program or an occupation will favor men in some cases and women in others. This in fact is to be expected if the ability differences described in this book are as stable as most seem to be" (Kimura 2000b, 185). As a result, Kimura suggests, we ought not to be troubled by the current marked inequalities in participation and success of women and men in, for example, mathematics, science, and engineering, and we certainly ought not to try to change the situation by, for example, instituting or continuing scholarships or research awards earmarked specifically for talented women (see, in this connection, Kimura 2000a, 2001, 2002a, 2004b, and 2006; and compare Pinker 2002 and 2005, and half the authors in Ceci and Williams 2007). Of course, other leading researchers contest these conclusions (see, e.g., Hyde 2000, Hines 2001, the other half of the authors in Ceci and Williams 2007, and Ceci and Williams 2010). Some of these researchers even raise questions about the motivation of such research. For example, Jeremy Caplan and Paula Caplan suggest that "studying 'sex differences' in cognition is not a neutral activity, any more than studying 'racial differences' in cognition. As long as our society is sexist, racist, or biased in any other way, any claim to find group differences is likely, sooner or later, to be held up as proof of the more powerful group's superiority" (Caplan and Caplan 2005, 25). Janet Shibley Hyde is more emphatic:

> Why gender? That is, why should the spotlight be on gender differences, rather than on a myriad of other possibilities, such as social class differences or eye-color differences? A major implication of the small effect size for gender differences in mathematics performance is that within-gender differences are far greater than between-gender differences. Surely there are other dimensions of individual differences in mathematics performance (such as, perhaps, learning style) that would be far more productive for scientific research. (Hyde 2000)

Steven Rose is more emphatic still:

> If attempts to answer these group-difference questions are fraught with scientific fallacies, might there nonetheless be some public-policy implications making investigation worthwhile? The answer sometimes advanced is that if

> there were such differences, and their causes were understood, the less well-endowed groups could be 'compensated' by some form of differentiated education. But in practice, claims that there are differences in intelligence between blacks and whites, or men and women, have always been used to justify a social hierarchy in which white males continue to occupy the premier positions (whether in the economy in general or natural science in particular). . . .
>
> In a society in which racism and sexism were absent, the questions of whether whites or men are more or less intelligent than blacks or women would not merely be meaningless—they would not even be asked. (Rose 2009, 788)

Nevertheless, the research still continues.

But fields such as psychology and biology are not the only sources of the view that women are inferior to men—demonstrably inferior, scientifically. The historical sciences, too, have supported this view of women's inferiority through their modes of representation of the past, modes of representation marked by heroic exploits and spectacular accomplishments of men counterposed with lackluster doings and nonaccomplishments, if not complete invisibility, of women. Consider archaeology, for example, a field in which, traditionally, the search for origins and pivotal developments in human evolution defines the "big" questions. It is this search, in fact, that allows archaeologists to structure their discipline and make their sometime-stirring statements about human nature and human society when presenting the results of their research. Until very recently, however, what archaeologists have recognized as the "hallmarks" of human evolution—tools, fire, hunting, food storage, language, agriculture, metallurgy—have all been associated with men. Take agriculture. Although women have been firmly associated by archaeologists with plants, both with gathering them (before the emergence of agriculture) and with cultivating them (after), when archaeologists have turned to the profoundly culture-transforming shift in subsistence practice represented by the invention of agriculture, women have disappeared from discussion. Until the 1990s, for example, dominant explanations of the emergence of agriculture in the eastern woodlands of North America have posited either male shamans and their ceremonial use of gourd rattles as the catalysts for this transition or plants' "automatic" processes of adaptation to the environmentally disturbed areas of human living sites (in which case, the plants essentially domesticated themselves). According to these explanations, in short, either men invented agriculture, or no one did (Watson and Kennedy 1991). "We have had, it seems, little problem in attributing a great deal of the archaeological record to men (the more salient stone tools, the hunting of big game, the making of 'art,' the development of power politics, the building of pyramids and mounds, the invention of writing by priests or temple accountants, domesticating gourds in order to have them available for shamans' rattles, etc.)" (Conkey 2008, 49). In addition, archaeologists have had little problem leaving out of the archaeological record what might easily, even stereotypically, have involved the

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