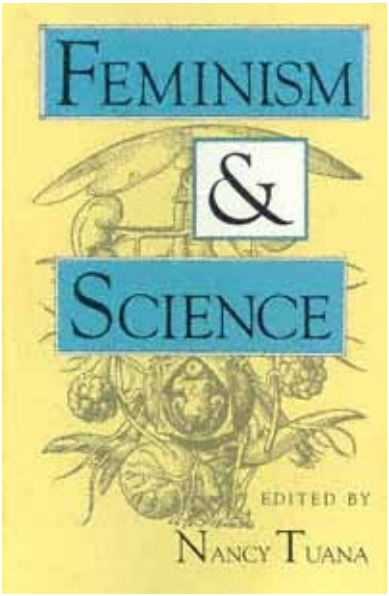

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Feminist Critiques of the Practice of Science

PREFACE

A being like the female, without the power of making concepts, is unable to make judgments. In her "mind" subjective and objective are not separated; there is no possibility of making judgments, and no possibility of reaching, or of desiring, truth. No woman is really interested in science; she may deceive herself and many good men, but bad psychologists, by thinking so.
(Weininger *1906, 194*)

The politics of science have included woman within the gaze of science but have excluded her from the practice of science. Weininger, in developing his "science of character," believed himself fully capable of describing and accounting for the nature of woman. In doing so, he defined women out of science. To be a scientist one must be objectivewoman is incapable of objectivity. A scientist makes rational judgmentswoman is incapable of reason. A scientist desires truthwoman desires only truth's opposite, passion.

This conception of woman's nature has excluded us from the very process of defining ourselves. Our silence is dictated; we are made into an object of study. But this exclusion has also precluded our participation in the defining of science. Through the feminist critiques of science developed over the last decade, we have given voice to our views about the politics and practice of science. We have uncovered the complex interconnection of sexist, racist, and classist biases grounding theories of human nature, and in doing so have seen the ways in which such biases permeate the entire structure of science. Feminist critiques of science have thus begun to focus on the ideologies, politics, epistemologies, economies, and metaphysics of traditional science.

This analysis has given rise to a number of difficult questions. "What kind/kinds of science is/are consistent with our critiques?" "Are we asking for a feminist science?" "Is there a feminist method?" "Why should feminist values take precedent over others?" "Do women do science differently than men?" "Is sexist science bad science?"

In recognition of the importance of these topics for feminist scholars and for philosophers of science, two issues of *Hypatia: A Journal of Feminist Philosophy* were devoted to the topic of feminism and science [1987 2(3), 1988 3(1)]. The essays reprinted here have been selected from those special issues of *Hypatia.* These essays offer a variety of perspectives. Many address

the above questions and the controversies raised by them. Others trace the role

of gender politics in the practice of science. Some attempt to offer future visions of a practice of science consistent with feminist values. Through them we see the variety of perspectives, epistemologies, and values involved in an examination of "the science question in feminism."

Sue V. Rosser opens the dialogue with an overview of feminist scholarship on women and science. Her work provides a helpful synthesis for readers familiar with the literature, and an introduction for those new to this area of feminist research. Her discussion of feminist critiques of science, feminine science, and feminist theories of science, is particularly relevant in that the articles in this anthology fall within one or more of these categories.

I have employed two of these categories to organize the articles in this anthology: feminist critiques of the practice of science and feminist theories of science. The first group of articles focuses primarily upon feminist analyses of the epistemological frameworks of modern science, or what Rosser calls feminist theories of science. The second group of articles involves critiques of the ways in which the practice of science is affected by, and in turn reinforces, sexist, as well as racist, homophobic, and classist, biases. This division, however, is not exclusive. Potter, for instance, uses examples of sexist biases in the practice of science to reveal the ways in which such biases are part of the methods and metaphysics of science.

A connecting theme of Harding, Keller, and Longino's articles is the question, "Are we asking for a feminist science?" According to all three, the answer is a definite "No!" Harding argues against the idea of a distinctive feminist method of research, noting that an important component of many feminist critiques is the rejection of the "methodolatry" of assuming that any one method can encompass the varieties of possible types of knowledge and experience. In place of a quest for a feminist method, Harding offers an examination of the characteristics that account for the fruitfulness and power of contemporary feminist research.

Keller and Longino emphasize the social construction of our category of "feminine" as well as that of "science." Keller notes the parallels between the relation of sex and gender, with that of nature and science. She employs this parallel to illustrate the political construction of our notions of difference, and to call for an alternative understanding that would make viable a notion of "difference in science" rather than a "different science." Longino cautions us against uncritically embracing the notion of a science that values the

"feminine," reminding us of the multiplicity of women's experiences, as well as the social construction of our conception of the feminine.

Longino suggests that we shift focus from research programs that are an expression of woman's nature to programs that are consistent with the values and commitments we express in the rest of our livesfrom constructing a feminist science to the process of doing science as a feminist. She demonstrates that the idea of a feminist science assumes an absolutism contradictory

with the feminist recognition of the ways in which values inform the practice and theory of science.

Irigaray directs her gaze at the language of science, arguing that the sexism of science is so deeply rooted that it is a part of the discourse of science. She illustrates how scientists speak as if without subject, dropping any reference to "I" or "you" or "we." Scientists claim to "let the facts speak for themselves," positing a transcendent position reflecting the desire to be "in front of nature," and thus forgetting that they are in nature. While acknowledging that gender biases affect the questions that scientists askdirecting research, say, to female contraception rather than maleIrigaray emphasizes that the very language of science limits the possibilities for discourse. The logic of science allows for such relations as negation, conjunction, disjunction, or implication, but talk of difference, reciprocity, exchange, permeability, or fluidity are hampered or silenced by it. To give voice to these silenced possibilities, Irigaray calls for a language that is differently sexed. We can read Ginzberg's "Uncovering Gynocentric Science" in this context as an attempt to give voice to such a way of speaking of science.

Ginzberg argues that an alternative practice of science, what she calls gynocentric science, has a long history but has been overlooked because it differs in significant ways from traditional science. Suggesting that love and eros are central to the epistemology of this science, Ginzberg reexamines midwifery as a paradigm of gynocentric science.

The essays of Alcoff and Heldke focus upon the epistemological under-pinnings of contemporary feminist critiques of science. Alcoff, like Harding and Longino, cautions against the easy assumption that by removing all elements of masculine bias from science we will have purified science. Such a position assumes an objectivist epistemology inconsistent with numerous feminist perspectives. (Irigaray here serves as an excellent example.) Alcoff also critiques the opposite movement into a radical relativism. She offers for discussion two models of theory-choice employed by feminist theorists to undercut both absolutism and radical relativism: the Holistic Model, which she traces through Peirce, Quine, and Hesse, to Harding, Potter, and Keller; and the Constructivist Model of Foucault and Gadamer, exemplified by the work of Westkott, Smith, Hartsock, and de Lauretis.

Heldke continues the dialogue begun by Alcoff by offering a detailed

discussion of the epistemology of Evelyn Fox Keller. Showing similarities between Keller's epistemology and that of John Dewey, Heldke argues that Keller's epistemology involves neither absolutism nor relativism. One similarity between the epistemologies of Keller and Dewey illustrated by Heldke is a respect for difference. Through her discussion, Heldke offers a valuable analysis of the concept of difference, a concept that plays a central role in Keller's article.

I begin the section on feminist critiques of the practice of science with

Hubbard's reflections upon the nature of a science consistent with feminist values. Desiring a science in which people take responsibility for the facts that are generated, Hubbard considers the alternatives of a science *for* the people and a science *by* the people. To emphasize the need for such alternatives, she illustrates the variety of ways in which people get excluded from science. From the social structure of the laboratory, to the ideology of woman's nature, to the gender bias of the language of science, Hubbard points out the political content and role of contemporary science. Agreeing with Harding, Longino, and Alcoff that politics is an inherent part of any science, Hubbard calls for a science to which more people have access and a process of validation that is under public scrutiny.

Potter addresses the question, "Is sexist science bad science?" She argues that the question itself presupposes an objectivity and absolutism inconsistent with many feminist perspectives, and blurs our understanding of the gender politics of theory construction. She advocates the adoption of an extended Network Model of theory-construction, or what Alcoff labeled the Holistic Model. Through a detailed examination of the circumstances surrounding the adoption of the corpuscular philosophy in England, Potter illustrates the ways in which theory generation can be affected by gender politics.

The next four essays offer case studies of the effects of gender bias on the practice of science. My essay examines the history of reproductive theory from Aristotle to the seventeenth century. I argue that the adherence to a belief in the inferiority of the female creative principle biased scientific perception of the nature of woman's role in human generation. The essay by the Biology and Gender Study Group continues this discussion by examining the narratives of nineteenth- and twentieth-century science concerning fertilization and sex determination. The Biology and Gender Study Group illustrate that the myths of male activity and female passivity, woman as incomplete, and the male as the true parent inform the models and metaphors of contemporary reproductive theories. They argue that alternative interpretations are made available by rejecting such biases.

Zita examines the evidence used to posit the existence of a premenstrual syndrome and the causal explanations designed to account for it. She traces a pattern of gender biases in the observations and theory construction surrounding PMS research. Zita offers an excellent example of the type of "context stripping" that is the subject of Irigaray's essay. Genova subjects

recent theories of hemispheric specialization and lateralization studies to a feminist critique. She demonstrates that the claims of sex difference arising from such studies involve an unacceptable determinism, an ideological bias against women, and a questionable theory of meaning.

As feminists have come to understand the depth of the impact of the gender system in science, we have realized that surface inequities are often grounded by less visible gender biases in the methods and metaphysic of

science. This has led us to question the model of science in which science, done properly, is viewed as the epitome of objectivity. Feminists, in company with other theorists, have rejected this image of science. Science is a cultural institution and as such is structured by the political, social, and economic values of the culture within which it is practiced. Although feminists were not the first to reject the traditional image of science, we were the first to carefully explore the myriad ways in which sexist biases affected the nature and practice of science. The articles in this anthology are part of this important and exciting investigation.

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PART ONE
OVERVIEW

Feminist Scholarship in the Sciences: Where Are We Now and When Can We Expect a Theoretical Breakthrough?

Sue V. Rosser

The work of feminists in science may seem less voluminous and less theoretical than the feminist scholarship in some humanities and social science disciplines. However, the recent burst of scholarship on women and science allows categorization of feminist work into six distinct but related categories: 1) teaching and curriculum transformation in science, 2) history of women in science, 3) current status of women in science, 4) feminist critique of science, 5) feminine science, 6) feminist theory of science. More feminists in science are needed to further explore science and its relationships to women and feminism in order to change traditional science to a feminist science.

The trickle of scholarship on feminism and science begun in the late 1960s and 70s has widened in the 1980s to a continuous stream of books and articles in journals expressing the new scholarship. The work of feminists in science may seem less voluminous and less theoretical than the feminist scholarship in some humanities and social science disciplines. Men continue to dominate science in terms of numbers (National Science Foundation 1986). Feminist philosophers and historians of science (Fee 1981; 1982; Haraway 1978; Hein 1981; and Keller 1982) have described the specific ways in which the very objectivity said to be characteristic of scientific knowledge and the whole dichotomy between subject and object are, in fact, male ways of relating to the world, which specifically exclude women. This "masculinity" of science has contributed to the difficulty for feminists engaging in scientific scholarship. However, the recent increase in amounts and variety of feminist scientific scholarship may be buildingthe foundations for more theoretical work towards a feminist transformation of science.

Hypatia vol. 2, no. 3 (Fall 1987).

The work done by feminists in science might be divided into six distinct but related categories:

1) Teaching and curriculum transformation in science: From the beginning of the current phase of the women's movement, feminists in science have sought means to include more information about women in the science curriculum and methods to attract women to the study of science. Some of the earlier writing in this area focused on course content, appropriate readings, and syllabi for courses on women's health (Beckwith 1981) which included information not covered in standard science and health curricula. Very soon, courses on gender and science, which dealt with how theories and methods of science are biased by gender or support established assumptions about gender (Fausto-Sterling 1982), were described. Writings on several courses about the history of women in science also emerged at about this time (Kien 1984; Alic 1982). Biologists such as Lowry and Woodhull (1983) studied and wrote about factors in college science programs that bring women to major in science. More recently, scientists (Rosser 1986) have focused upon the varieties of women-related courses taught in different parts of the science curriculum and upon integration of information about women and feminist approaches into the traditional introductory level courses in science (Schuster and Van Dyne 1985; Woodhull et al. 1985; Rosser 1985).

2) History of women in science: Although we sometimes labor under the false impression that women have only become scientists in the latter half of the 20th century, early works by Christine de Pizan ([1405] 1982), Giovanni Boccaccio ([135559] 1963), and H. J. Mozans ([1913] 1974) recorded past achievements of women in science. Their works underscore the fact that women have always been in science. However, all too frequently the work of women scientists has been credited to others, brushed aside and misunderstood, or classified as non-science. There are several classic examples of the loss of the names of women scientists and the values of their work. Eli Whitney was the employee of Catherine Green, the person who really invented the cotton gin. Since Whitney applied for the patent, he is credited with the invention of this important piece of technology (Haber 1979). Rosalind Franklin's fundamental work on the x-ray crystallography of DNA, which led to the theoretical speculation of the double helical nature of the molecule by Watson and Crick, continues to be brushed aside and undervalued (Watson 1969; Sayre 1975). The groundbreaking work of Ellen Swallow in water, air and food purity, sanitation, and industrial waste disposal