

The Science Question
in Feminism

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CONTENTS

Acknowledgments	7
Preface	9
1 From the Woman Question in Science to the Science Question in Feminism	15
2 Gender and Science: Two Problematic Concepts	30
3 The Social Structure of Science: Complaints and Disorders	58
4 Androcentrism in Biology and Social Science	82
5 Natural Resources: Gaining Moral Approval for Scientific Genders and Genderized Sciences	111
6 From Feminist Empiricism to Feminist Standpoint Epistemologies	136
7 Other "Others" and Fractured Identities: Issues for Epistemologists	163

5

Contents	
8	"The Birth of Modern Science" as a Text: Internalist and Externalist Stories 197
9	Problems with Post-Kuhnian Stories 216
10	Valuable Tensions and a New "Unity of Science" 243
	Bibliography 253
	Index 263

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PREFACE

Since the mid-1970s, feminist criticisms of science have evolved from a reformist to a revolutionary position, from analyses that offered the possibility of improving the science we have, to calls for a transformation in the very foundations both of science and of the cultures that accord it value. We began by asking, "What is to be done about the situation of women in science?"—the "woman question" in science. Now feminists often pose a different question: "Is it possible to use for emancipatory ends sciences that are apparently so intimately involved in Western, bourgeois, and masculine projects?"—the "science question" in feminism.

The radical feminist position holds that the epistemologies, metaphysics, ethics, and politics of the dominant forms of science are androcentric and mutually supportive; that despite the deeply ingrained Western cultural belief in science's intrinsic progressiveness, science today serves primarily regressive social tendencies; and that the social structure of science, many of its applications and technologies, its modes of defining research problems and designing experiments, its ways of constructing and conferring meanings are not only sexist but also racist, classist, and culturally coercive. In their analyses of how gender symbolism, the social division of labor by gender, and the construction of individual gender identity have affected the history and philosophy of science, feminist thinkers have challenged the intellectual and social orders at their very foundations.

These feminist critiques, which debunk much of what we value in modern Western culture, appear to emerge from outside this culture.

Preface

That is indeed the case insofar as women have been excluded from the processes of defining the culture and have been conceived as the "other" against which men in power define their projects. Yet such destabilizing, "exploding," of the categories of social practice and thought is firmly within the tradition of modern Western history and its explicit commitment to criticism of traditional social practices and beliefs. One such belief is that androcentrism is "natural" and right; another is faith in the progressiveness of scientific rationality. From this perspective, the feminist critiques of science may be seen as calling for a more radical intellectual, moral, social, and political revolution than the founders of modern Western cultures could have imagined. Historically, it is just such revolutions—and not the process of scientific inquiry alone—that have fostered the development of progressive kinds of knowledge-seeking.

This book examines important trends in the feminist critiques of science with the aim of identifying tensions and conflicts between them, inadequate concepts informing their analyses, unrecognized obstacles to and gaps in their research programs, and extensions that might transform them into even more powerful tools for the construction of emancipatory meanings and practices. Motivating my investigation is the belief that these feminist science critiques can be shown to have implications at least as revolutionary for modern Western cultural self-images as feminist critiques in the humanities and social sciences have had.

It should not need to be said—but probably does—that I do not wish to be understood as recommending that we throw out the baby with the bathwater. We do not imagine giving up speaking or writing just because our language is deeply androcentric; nor do we propose an end to theorizing about social life once we realize that thoroughly androcentric perspectives inform even our feminist revisions of the social theories we inherit. Similarly, I am not proposing that humankind would benefit from renouncing attempts to describe, explain, and understand the regularities, underlying causal tendencies, and meanings of the natural and social worlds just because the sciences we have are androcentric. I am seeking an end to androcentrism, not to systematic inquiry. But an end to androcentrism will require far-reaching transformations in the cultural meanings and practices of that inquiry.

The first two chapters provide an overview and theoretical introduction. Chapter 1 identifies five feminist critiques and three feminist epistemological programs, and points to the challenges each of these

faces. Chapter 2 looks at some problems in the understanding of both science and gender in the feminist science criticisms, and shows how these create obstacles to the development of a feminist theory of science; I then develop the more adequate concepts of science and gender that inform the following chapters.

The next three chapters show the connections between the parts of the picture of science that feminist critics have produced, and identify inconsistencies and oversights. Chapter 3 reviews the feminist approaches to equity issues in the structure of science and points to the tensions between these ahistorical images and the reality of science's social structure. Chapter 4 scrutinizes the feminist charges of androcentrism in the selection of problematics (of what is defined as requiring scientific explanation) and the design of research in biology and the social sciences (I include the social sciences here to prepare for later analysis of the inadequate social assumptions that have guided the mainstream understandings of modern science). Chapter 5 examines science's contribution to the construction of gendered meanings for both nature and inquiry and reviews the literature showing that much of what is commonly taken to be biological sex difference and sexual desire is socially constructed.

Chapters 6 and 7 turn to feminist theories of knowledge, the epistemological grounds for modern science, and the alternative justificatory strategies proposed by feminist critics. Chapter 6 examines the "successor science" projects of four theorists—Hilary Rose, Dorothy Smith, Jane Flax, and Nancy Hartsock—and their attempts to envision forms and purposes of knowledge-seeking that are alternative to those used to justify the science we have. In Chapter 7 I describe some obstacles that these epistemologies face; by focusing on the relationship between these feminist projects and similar emancipatory science projects of ex-colonial peoples, I also consider some of the difficult questions the "successor science" projects and feminist postmodernist critiques pose for each other.

Chapters 8 and 9 provide a pause in the argument by returning to the history of science in an effort to account for the deterioration of socially progressive knowledge-seeking (readers who prefer plots uninterrupted by the ghostly appearances of the protagonist's garrulous ancestors may want to skip to Chapter 10). Chapter 8, which treats the institution of science as a personage passing from infancy to adulthood, identifies gaps in the standard stories this adult personage tells about its infancy. Chapter 9 examines one kind of attempt by recent

Preface

social histories of science to fill these gaps, and argues that even they tend to repress what they need to redress by systematically avoiding consideration of gender symbolism and actual social relations between the genders in history.

Chapter 10 returns to the main plot to reflect on some central instabilities and tensions within the feminist theories I have been examining and developing. It identifies questions asked by the science critiques that cannot be answered in the terms in which they have been posed. I conclude by pointing to the way feminist science critiques have assumed a reversal of the "unity of science" thesis so central to the members of the Vienna Circle. For feminists, it is moral and political, rather than scientific, discussion that has served as the paradigm—though a problematic one—of rational discourse.

S.H.

THE SCIENCE QUESTION IN FEMINISM

1 FROM THE WOMAN QUESTION IN SCIENCE TO THE SCIENCE QUESTION IN FEMINISM

Feminist scholars have studied women, men, and social relations between the genders within, across, and insistently against the conceptual frameworks of the disciplines. In each area we have come to understand that what we took to be humanly inclusive problematics, concepts, theories, objective methodologies, and transcendental truths are in fact far less than that. Instead, these products of thought bear the mark of their collective and individual creators, and the creators in turn have been distinctively marked as to gender, class, race, and culture.¹ We can now discern the effects of these cultural markings in the discrepancies between the methods of knowing and the interpretations of the world provided by the creators of modern Western culture and those characteristic of the rest of us. Western culture's favored beliefs mirror in sometimes clear and sometimes distorting ways not

¹I make a sharp distinction between "sex" and "gender" (even though this is a dichotomy I shall later problematize); thus I refer to "gender roles" rather than "sex roles," etc., retaining only a few terms such as "sexism," where the substitution seems more distracting than useful. Otherwise (except in direct quotations), I use "sex" only when it is, indeed, biology that is at issue. There are two reasons for this policy. First, in spite of feminist insistence for decades, perhaps centuries, that women's and men's "natures" and activities are primarily shaped by social relations, not by immutable biological determinants, many people still do not grasp this point or are unwilling to commit themselves to its full implications (the current fascination with sociobiology is just one evidence of this problem). Second, the very thought of sex exerts its own fatal attraction for many otherwise well-intentioned people: such phrases as "sexual politics," "the battle between the sexes," and "male chauvinism" make the continuation of gender hostilities sound far more exciting than feminism should desire.

The Science Question in Feminism

the world as it is or as we might want it to be, but the social projects of their historically identifiable creators.

The natural sciences are a comparatively recent subject of feminist scrutiny. The critiques excite immense anticipation—or fear—yet they remain far more fragmented and less clearly conceptualized than feminist analyses in other disciplines.

The anticipation and fear are based in the recognition that we are a scientific culture, that scientific rationality has permeated not only the modes of thinking and acting of our public institutions but even the ways we think about the most intimate details of our private lives. Widely read manuals and magazine articles on child rearing and sexual relations gain their authority and popularity by appealing to science. And during the last century, the social use of science has shifted: formerly an occasional assistant, it has become the direct generator of economic, political, and social accumulation and control. Now we can see that the hope to “dominate nature” for the betterment of the species has become the effort to gain unequal access to nature’s resources for purposes of social domination. No longer is the scientist—if he ever was—an eccentric and socially marginal genius spending private funds and often private time on whatever purely intellectual pursuits happen to interest him. Only very rarely does his research have no foreseeable social uses. Instead, he (or, more recently, she) is part of a vast work force, is trained from elementary school on to enter academic, industrial, and governmental laboratories where 99 + percent of the research is expected to be immediately applicable to social projects. If these vast industrialized empires, devoted—whether intentionally or not—to material accumulation and social control, cannot be shown to serve the best interests of social progress by appeal to objective, dispassionate, impartial, rational knowledge-seeking, then in our culture they cannot be legitimated at all. Neither God nor tradition is privileged with the same credibility as scientific rationality in modern cultures.

Of course, feminists are not the first group to scrutinize modern science in this way. Struggles against racism, colonialism, capitalism, and homophobia, as well as the counter culture movement of the 1960s and the contemporary ecology and antimilitarism movements, have all produced pointed analyses of the uses and abuses of science. But the feminist criticisms appear to touch especially raw nerves. For one thing, at their best they incorporate the key insights of these other movements while challenging the low priority that specifically feminist concerns have been assigned in such agendas for social reform. For

another, they question the division of labor by gender—a social aspect of the organization of human relations that has been deeply obscured by our perceptions of what is “natural” and what is social. Perhaps most disturbingly, they challenge our sense of personal identity at its most prerational level, at the core. They challenge the desirability of the gendered aspects of our personalities and the expression of gender in social practices, which for most men and women have provided deeply satisfying parts of self-identity.

Finally, as a symbol system, gender difference is the most ancient, most universal, and most powerful origin of many morally valued conceptualizations of everything else in the world around us. Cultures assign a gender to such nonhuman entities as hurricanes and mountains, ships and nations. As far back in history as we can see, we have organized our social and natural worlds in terms of gender meanings within which historically specific racial, class, and cultural institutions and meanings have been constructed. Once we begin to theorize gender—to define gender as an analytic category within which humans think about and organize their social activity rather than as a natural consequence of sex difference, or even merely as a social variable assigned to individual people in different ways from culture to culture—we can begin to appreciate the extent to which gender meanings have suffused our belief systems, institutions, and even such apparently gender-free phenomena as our architecture and urban planning. When feminist thinking about science is adequately theorized, we will have a clearer grasp of how scientific activity is and is not gendered in this sense.

Now it is certainly true that racism, classism, and cultural imperialism often more deeply restrict the life opportunities of individuals than does sexism. We can easily see this if we compare the different life opportunities available to women of the same race but in different classes, or of the same class but in different races, in the United States today or at any other time and place in history. Consequently, it is understandable why working-class people and victims of racism and imperialism often place feminist projects low on their political agendas. Furthermore, gender appears only in culturally specific forms. As we shall see in the next chapter, gendered social life is produced through three distinct processes: it is the result of assigning dualistic gender metaphors to various perceived dichotomies that rarely have anything to do with sex differences; it is the consequence of appealing to these gender dualisms to organize social activity, of dividing necessary social

The Science Question in Feminism

activities between different groups of humans; it is a form of socially constructed individual identity only imperfectly correlated with either the "reality" or the perception of sex differences. I shall be referring to these three aspects of gender as *gender symbolism* (or, borrowing a term from anthropology, "gender totemism"), *gender structure* (or the division of labor by gender), and *individual gender*. The referents for all three meanings of masculinity and femininity differ from culture to culture, though within any culture the three forms of gender are related to each other. Probably few, if any, symbolic, institutional, or individual identity or behavioral expressions of masculinity and femininity can be observed in all cultures or at all times in history.

But the fact that there are class, race, and cultural differences between women and between men is not, as some have thought, a reason to find gender difference either theoretically unimportant or politically irrelevant. In virtually every culture, gender difference is a pivotal way in which humans identify themselves as persons, organize social relations, and symbolize meaningful natural and social events and processes. And in virtually all cultures, whatever is thought of as manly is more highly valued than what is thought of as womanly. Moreover, we need to recognize that in cultures stratified by both gender and race, gender is always also a racial category and race a gender category. That is, sexist public policies are different for people of the same gender but different race, and racist policies are different for women and men within the same race. One commentator has proposed that we think of these policies as, respectively, racist sexism and sexist racism.²

Finally, we shall later examine the important role to be played in emancipatory epistemologies and politics by open recognition of gender differences within racial groups and racial and cultural differences within gender groups. "Difference" can be a slippery and dangerous rallying point for inquiry projects and for politics, but each emancipatory struggle needs to recognize the agendas of other struggles as integral parts of its own in order to succeed. (After all, people of color come in at least two genders, and women are of many colors.) For each struggle, epistemologies and politics grounded in solidarities could replace the problematic ones that appeal to essentialized identities, which are, perhaps, spurious.

²Boch (1983). See also Caulfield (1974); Davis (1971). (Works cited in my notes by author and year of publication receive full citation in the bibliography, which lists the sources I have found most useful for this study. Additional references appear in full in the footnotes.)

From the Woman Question to the Science Question

For all these reasons, feminist critiques claiming that science, too, is gendered appear deeply threatening to the social order, even in societies such as ours where racism, classism, and imperialism also direct all our lives. Obviously, the different forms of domination use one another as resources and support one another in complex ways. If we find it difficult to imagine the day-to-day details of living in a world no longer structured by racism and classism, most of us do not even know how to start imagining a world in which gender difference, in its equation of masculinity with authority and value, no longer constrains the ways we think, feel, and act. And the day-to-day world we live in is so permeated by scientific rationality as well as gender that to nonfeminists and perhaps even some feminists, the very idea of a feminist critique of scientific rationality appears closer to blasphemy than to social-criticism-as-usual.

Feminists in other fields of inquiry have begun to formulate clear and coherent challenges to the conceptual frameworks of their disciplines. By putting women's perspective on gender symbolism, gender structure, and individual gender at the center of their thinking, they have been able to reconceive the purposes of research programs in anthropology, history, literary criticism, and so forth.³ They have begun to retheorize the proper subject matters of the understandings these disciplines could provide. But I think the proper subject matters and purposes of a feminist critique of science have, thus far, eluded the firm grip and the clear conceptualizations that are becoming evident in much of this other research. The voice of feminist science criticism alternates among five different kinds of projects, each with its own audience, subject matter, ideas of what science is and what gender is, and set of remedies for androcentrism. In certain respects, the assumptions guiding these analyses directly conflict. It is not at all clear how their authors conceive of the theoretical connections between them, nor, therefore, what a comprehensive strategy for eliminating androcentrism from science would look like. This is particularly troublesome because clarity about so fundamental a component of our culture can have powerful effects elsewhere in feminist struggles.

One problem may be that we have been so preoccupied with responding to the sins of contemporary science in the same terms our culture uses to justify these sins that we have not yet given adequate attention to envisioning truly emancipatory knowledge-seeking. We

³McIntosh (1983).

have not yet found the space to step back and image up the whole picture of what science might be in the future. In our culture, reflecting on an appropriate model of rationality may well seem a luxury for the few, but it is a project with immense potential consequences: it could produce a politics of knowledge-seeking that would show us the conditions necessary to transfer control from the "haves" to the "have-nots."

What kind of understanding of science would we have if we began not with the categories we now use to grasp its inequities, misuses, falsities, and obscurities but with those of the biologist protagonist imagined by Marge Piercy in *Woman on the Edge of Time*, who can shift her/his sex at will and who lives in a culture that does not institutionalize (i.e., does not have) gender? or with the assumptions of a world where such categories as machine, human, and animal are no longer either distinct or of cultural interest, as in Anne McCaffrey's *The Ship Who Sang*?⁴ Perhaps we should turn to our novelists and poets for a better intuitive grasp of the theory we need. Though often leaders in the political struggles for a more just and caring culture, they are professionally less conditioned than we to respond point by point to a culture's defenses of its ways of being in the world.

FIVE RESEARCH PROGRAMS

To draw attention to the lack of a developed feminist theory for the critique of the natural sciences is not to overlook the contributions these young but flourishing lines of inquiry have made. In a very short period of time, we have derived a far clearer picture of the extent to which science, too, is gendered. Now we can begin to understand the economic, political, and psychological mechanisms that keep science sexist and that must be eliminated if the nature, uses, and valuations of knowledge-seeking are to become humanly inclusive ones. Each of these lines of inquiry raises intriguing political and conceptual issues, not only for the practices of science and the ways these practices are legitimated but also for each other. Details of these research programs are discussed in following chapters; I emphasize here the problems they raise primarily to indicate the undertheorization of the whole field.

⁴Marge Piercy, *Woman on the Edge of Time* (New York: Fawcett, 1981); Anne McCaffrey, *The Ship Who Sang* (New York: Ballantine, 1976). Donna Haraway (1985) discusses the potentialities that McCaffrey's kind of antidualism opens up for feminist theorizing.

First of all, equity studies have documented the massive historical resistance to women's getting the education, credentials, and jobs available to similarly talented men;⁵ they have also identified the psychological and social mechanisms through which discrimination is informally maintained even when the formal barriers have been eliminated. Motivation studies have shown why boys and men more often want to excel at science, engineering, and math than do girls and women.⁶ But should women want to become "just like men" in science, as many of these studies assume? That is, should feminism set such a low goal as mere equality with men? And to which men in science should women want to be equal—to underpaid and exploited lab technicians as well as Nobel Prize winners? Moreover, should women want to contribute to scientific projects that have sexist, racist, and classist problematics and outcomes? Should they want to be military researchers? Furthermore, what has been the effect of women's naiveté about the depth and extent of masculine resistance—that is, would women have struggled to enter science if they had understood how little equity would be produced by eliminating the formal barriers against women's participation?⁷ Finally, does the increased presence of women in science have any effect at all on the nature of scientific problematics and outcomes?

Second, studies of the uses and abuses of biology, the social sciences, and their technologies have revealed the ways science is used in the service of sexist, racist, homophobic, and classist social projects. Oppressive reproductive policies; white men's management of all women's domestic labor; the stigmatization of, discrimination against, and medical "cure" of homosexuals; gender discrimination in workplaces—all these have been justified on the basis of sexist research and maintained through technologies, developed out of this research, that move control of women's lives from women to men of the dominant group.⁸ Despite the importance of these studies, critics of the sexist uses of science often make two problematic assumptions: that there is a value-free, pure scientific research which can be distinguished from the social uses of science; and that there are proper uses of science with which we

⁵See, e.g., Rossiter (1982b); Walsh (1977).

⁶See Aldrich (1978).

⁷Rossiter (1982b) makes this point.

⁸See Tobach and Rosoff (1978; 1979; 1981; 1984); Brighton Women and Science Group (1980); Ehrenreich and English (1979); Rothschild (1983); Zimmerman (1983); Arditti, Duelli-Klein, and Minden (1984).

The Science Question in Feminism

can contrast its improper uses. Can we really make these distinctions? Is it possible to isolate a value-neutral core from the uses of science and its technologies? And what distinguishes improper from proper uses? Furthermore, each misuse and abuse has been racist and classist as well as oppressive to women. This becomes clear when we note that there are different reproductive policies, forms of domestic labor, and forms of workplace discrimination mandated for women of different classes and races even within U.S. culture at any single moment in history. (Think, for instance, of the current attempt to restrict the availability of abortion and contraceptive information for some social groups at the same time that sterilization is forced on others. Think of the resuscitation of scientifically supported sentimental images of motherhood and nuclear forms of family life for some at the same time that social supports for mothers and nonnuclear families are systematically withdrawn for others.) Must not feminism take on as a central project of its own the struggle to eliminate class society and racism, homophobia and imperialism, in order to eliminate the sexist uses of science?

Third, in the critiques of biology and the social sciences, two kinds of challenges have been raised not just to the actual but to the possible existence of any pure science at all.⁹ The selection and definition of problematics—deciding what phenomena in the world need explanation, and defining what is problematic about them—have clearly been skewed toward men's perception of what they find puzzling. Surely it is "bad science" to assume that men's problems are everyone's problems, thereby leaving unexplained many things that women find problematic, and to assume that men's explanations of what they find problematic are undistorted by their gender needs and desires. But is this merely—or, perhaps, even—an example of bad science? Will not the selection and definition of problems always bear the social fingerprints of the dominant groups in a culture? With these questions we glimpse the fundamental value-ladenness of knowledge-seeking and thus the impossibility of distinguishing between bad science and science-as-usual. Furthermore, the design and interpretation of research again and again has proceeded in masculine-biased ways. But if problems are necessarily value-laden, if theories are constructed to explain

⁹The literature here is immense. For examples of these criticisms, see Longino and Doell (1983); Hubbard, Henifin, and Fried (1982); Gross and Averill (1983); Tobach and Rosoff (1978; 1979; 1981; 1984); Millman and Kanter (1975); Andersen (1983); Westkott (1979).

problems, if methodologies are always theory-laden, and if observations are methodology-laden, can there be value-neutral design and interpretation of research? This line of reasoning leads us to ask whether it is possible that some kinds of value-laden research are nevertheless maximally objective. For example, are overtly antisexist research designs inherently more objective than overtly sexist or, more important, "sex-blind" (i.e., gender-blind) ones? And are antisexist inquiries that are also self-consciously antiracist more objective than those that are not? There are precedents in the history of science for preferring the distinction between objectivity-increasing and objectivity-decreasing social values to the distinction between value-free and value-laden research. A different problem is raised by asking what implications these criticisms of biology and social science have for areas such as physics and chemistry, where the subject matter purportedly is physical nature rather than social beings ("purportedly" because, as we shall see, we must be skeptical about being able to make any clear distinctions between the physical and the nonphysical). What implications could these findings and this kind of reasoning about objectivity have for our understanding of the scientific world view more generally?

Fourth, the related techniques of literary criticism, historical interpretation, and psychoanalysis have been used to "read science as a text" in order to reveal the social meanings—the hidden symbolic and structural agendas—of purportedly value-neutral claims and practices.¹⁰ In textual criticism, metaphors of gender politics in the writings of the fathers of modern science, as well as in the claims made by the defenders of the scientific world view today, are no longer read as individual idiosyncrasies or as irrelevant to the meanings science has for its enthusiasts. Furthermore, the concern to define and maintain a series of rigid dichotomies in science and epistemology no longer appears to be a reflection of the progressive character of scientific inquiry; rather, it is inextricably connected with specifically masculine—and perhaps uniquely Western and bourgeois—needs and desires. Objectivity vs. subjectivity, the scientist as knowing subject vs. the objects of his inquiry, reason vs. the emotions, mind vs. body—in each case the former has been associated with masculinity and the latter with femininity. In each case it has been claimed that human progress requires the former to achieve domination of the latter.¹¹

¹⁰Good examples are Keller (1984); Merchant (1980); Griffin (1978); Flax (1983); Jordanova (1980); Bloch and Bloch (1980); Harding (1980).

¹¹The key "object-relations" theorists among these textual critics are Dinnerstein (1976); Chodorow (1978); Flax (1983). See also Balbus (1982).

The Science Question in Feminism

Valuable as these textual criticisms have been, they raise many questions. What relevance do the writings of the fathers of modern science have to contemporary scientific practice? What theory would justify regarding these metaphors as fundamental components of scientific explanations? How can metaphors of gender politics continue to shape the cognitive form and content of scientific theories and practices even when they are no longer overtly expressed? And can we imagine what a scientific mode of knowledge-seeking would look like that was not concerned to distinguish between objectivity and subjectivity, reason and the emotions?

Fifth, a series of epistemological inquiries has laid the basis for an alternative understanding of how beliefs are grounded in social experiences, and of what kind of experience should ground the beliefs we honor as knowledge.¹² These feminist epistemologies imply a relation between knowing and being, between epistemology and metaphysics, that is an alternative to the dominant epistemologies developed to justify science's modes of knowledge-seeking and ways of being in the world. It is the conflicts between these epistemologies that generate the major themes of this study.

A GUIDE TO FEMINIST EPISTEMOLOGIES

The epistemological problem for feminism is to explain an apparently paradoxical situation. Feminism is a political movement for social change. But many claims, clearly motivated by feminist concerns, made by researchers and theorists in the social sciences, in biology, and in the social studies of the natural sciences appear more plausible—more likely to be confirmed by evidence—than the beliefs they would replace. How can such politicized research be increasing the objectivity of inquiry? On what grounds should these feminist claims be justified?

We can usefully divide the main feminist responses to this apparent paradox into two relatively well-developed solutions and one agenda for a solution. I will refer to these three responses as *feminist empiricism*, the *feminist standpoint*, and *feminist postmodernism*.

Feminist empiricism argues that sexism and androcentrism are social biases correctable by stricter adherence to the existing methodological norms of scientific inquiry. Movements for social liberation "make it

¹²See Flax (1983); Rose (1983); Hartsock (1983b); Smith (1974; 1977; 1979; 1981); Harding (1983b); Fee (1981). Haraway (1985) proposes a somewhat different epistemology for feminism.

From the Woman Question to the Science Question

possible for people to see the world in an enlarged perspective because they remove the covers and blinders that obscure knowledge and observation."¹³ The women's movement produces not only the opportunity for such an enlarged perspective but more women scientists, and they are more likely than men to notice androcentric bias.

This solution to the epistemological paradox is appealing for a number of reasons, not the least because it appears to leave unchallenged the existing methodological norms of science. It is easier to gain acceptance of feminist claims through this kind of argument, for it identifies only bad science as the problem, not science-as-usual.

Its considerable strategic advantage, however, often leads its defenders to overlook the fact that the *feminist empiricist solution* in fact deeply subverts empiricism. The social identity of the inquirer is supposed to be irrelevant to the "goodness" of the results of research. Scientific method is supposed to be capable of eliminating any biases due to the fact that individual researchers are white or black, Chinese or French, men or women. But feminist empiricism argues that women (or feminists, whether men or women) *as a group* are more likely to produce unbiased and objective results than are men (or nonfeminists) as a group.

Moreover, though empiricism holds that scientific method is sufficient to account for historical increases in the objectivity of the picture of the world that science presents, one can argue that history shows otherwise. It is movements for social liberation that have most increased the objectivity of science, not the norms of science as they have in fact been practiced, or as philosophers have rationally reconstructed them. Think, for instance, of the effects of the bourgeois revolution of the fifteenth to seventeenth centuries, which produced modern science itself; or of the effects of the proletarian revolution of the nineteenth and early twentieth centuries. Think of the effects on scientific objectivity of the twentieth-century deconstruction of colonialism.

We shall also see that a key origin of androcentric bias can be found in the selection of problems for inquiry, and in the definition of what is problematic about these phenomena. But empiricism insists that its methodological norms are meant to apply only to the "context of justification"—to the testing of hypotheses and interpretation of evidence—not to the "context of discovery" where problems are identified and defined. Thus a powerful source of social bias appears completely

¹³Millman and Kanter (1975, vii).

The Science Question in Feminism

to escape the control of science's methodological norms. Finally, it appears that following the norms of inquiry is exactly what often results in androcentric results.

Thus, feminist attempts to reform what is perceived as bad science bring to our attention deep logical incoherences and what, paradoxically, we can call empirical inadequacies in empiricist epistemologies.

The feminist standpoint originates in Hegel's thinking about the relationship between the master and the slave and in the elaboration of this analysis in the writings of Marx, Engels, and the Hungarian Marxist theorist, G. Lukacs. Briefly, this proposal argues that men's dominating position in social life results in partial and perverse understandings, whereas women's subjugated position provides the possibility of more complete and less perverse understandings. Feminism and the women's movement provide the theory and motivation for inquiry and political struggle that can transform the perspective of women into a "standpoint"—a morally and scientifically preferable grounding for our interpretations and explanations of nature and social life. The feminist critiques of social and natural science, whether expressed by women or by men, are grounded in the universal features of women's experience as understood from the perspective of feminism.¹⁴

While this attempted solution to the epistemological paradox avoids the problems that beset feminist empiricism, it generates its own tensions. First of all, those wedded to empiricism will be loath to commit themselves to the belief that the social identity of the observer can be an important variable in the potential objectivity of research results. Strategically, this is a less convincing explanation for the greater adequacy of feminist claims for all but the already convinced; it is particularly unlikely to appear plausible to natural scientists or natural science enthusiasts.

Considered on its own terms, the feminist standpoint response raises two further questions. Can there be a feminist standpoint if women's (or feminists') social experience is divided by class, race, and culture? Must there be Black and white, working-class and professional-class, American and Nigerian feminist standpoints? This kind of consideration leads to the postmodernist skepticism: "Perhaps 'reality' can have 'a' structure only from the falsely universalizing perspective of the master. That is, only to the extent that one person or group can

¹⁴Flax (1983), Rose (1983), Hartsock (1983b), and Smith (1974; 1977; 1979; 1981) all develop this standpoint approach.

From the Woman Question to the Science Question

dominate the whole, can 'reality' appear to be governed by one set of rules or be constituted by one privileged set of social relations."¹⁵ Is the feminist standpoint project still too firmly grounded in the historically disastrous alliance between knowledge and power characteristic of the modern epoch? Is it too firmly rooted in a problematic politics of essentialized identities?

Before turning briefly to the feminist postmodernism from which this last criticism emerges, we should note that both of the preceding epistemological approaches appear to assert that objectivity never has been and could not be increased by value-neutrality. Instead, it is commitments to antiauthoritarian, antielitist, participatory, and emancipatory values and projects that increase the objectivity of science. Furthermore, the reader will need to avoid the temptation to leap to relativist understandings of feminist claims. In the first place, feminist inquirers are never saying that sexist and antisexist claims are equally plausible—that it is equally plausible to regard women's situation as primarily biological *and* as primarily social, or to regard "the human" both as identical *and* nonidentical with "the masculine." The *evidence* for feminist vs. nonfeminist claims may be inconclusive in some cases, and many feminist claims that today appear evidentially secure will no doubt be abandoned as additional evidence is gathered and better hypotheses and concepts are constructed. Indeed, there should be no doubt that these normal conditions of research hold for many feminist claims. But agnosticism and recognition of the hypothetical character of all scientific claims are quite different epistemological stances from relativism. Moreover, whether or not feminists take a relativist stance, it is hard to imagine a coherent defense of cognitive relativism when one thinks of the conflicting claims.

Feminist postmodernism challenges the assumptions upon which feminist empiricism and the feminist standpoint are based, although strains of postmodernist skepticism appear in the thought of these theorists, too. Along with such mainstream thinkers as Nietzsche, Derrida, Foucault, Lacan, Rorty, Cavell, Feyerabend, Gadamer, Wittgenstein, and Unger, and such intellectual movements as semiotics, deconstruction, psychoanalysis, structuralism, archeology/genealogy, and nihilism, feminists "share a profound skepticism regarding universal (or univ-

¹⁵Flax (1986, 17). Strains of postmodernism appear in all of the standpoint thinking. Of this group, Flax has most overtly articulated also the postmodernist epistemological issues.

The Science Question in Feminism

ersalizing) claims about the existence, nature and powers of reason, progress, science, language and the 'subject/self.'¹⁶

This approach requires embracing as a fruitful grounding for inquiry the fractured identities modern life creates: Black-feminist, socialist-feminist, women-of-color, and so on. It requires seeking a solidarity in our oppositions to the dangerous fiction of the naturalized, essentialized, uniquely "human" (read "manly") and to the distortion and exploitation perpetrated on behalf of this fiction. It may require rejecting fantasized returns to the primal wholeness of infancy, preclass societies, or pregender "unitary" consciousnesses of the species—all of which have motivated standpoint epistemologies. From this perspective, feminist claims are more plausible and less distorting only insofar as they are grounded in a solidarity between these modern fractured identities and between the politics they create.

Feminist postmodernism creates its own tensions. In what ways does it, like the empiricist and standpoint epistemologies, reveal incoherences in its parental mainstream discourse? Can we afford to give up the necessity of trying to provide "one, true, feminist story of reality" in the face of the deep alliances between science and sexist, racist, classist, and imperialist social projects?

Clearly, there are contradictory tendencies among the feminist epistemological discourses, and each has its own set of problems. The contradictions and problems do not originate in the feminist discourses, however, but reflect the disarray in mainstream epistemologies and philosophies of science since the mid-1960s. They also reflect shifting configurations of gender, race, and class—both the analytic categories and the lived realities. New social groups—such as feminists who are seeking to bridge a gap between their own social experience and the available theoretical frameworks—are more likely to hone in on "subjugated knowledge" about the world than are groups whose experience more comfortably fits familiar conceptual schemes. Most likely, the feminist entrance into these disputes should be seen as making significant contributions to clarifying the nature and implications of paradoxical tendencies in contemporary intellectual and social life.

The feminist criticisms of science have produced an array of conceptual questions that threaten both our cultural identity as a demo-

¹⁶Flax (1986, 3). This is Flax's list of the mainstream postmodernist thinkers and movements. See Haraway (1985), Marks and de Courtivron (1980), and *Signs* (1981) for discussion of the feminist postmodernist issues.

From the Woman Question to the Science Question

cratic and socially progressive society and our core personal identities as gender-distinct individuals. I do not mean to overwhelm these illuminating lines of inquiry with criticisms so early in my study—to suggest that they are not really feminist or that they have not advanced our understanding. On the contrary, each has greatly enhanced our ability to grasp the extent of androcentrism in science. Collectively, they have made it possible for us to formulate new questions about science.

It is a virtue of these critiques that they quickly bring to our attention the socially damaging incoherences in all the nonfeminist discourses. Considered in the sequence described in this chapter, they move us from the Woman Question in science to the more radical Science Question in feminism. Where the first three kinds of criticism primarily ask how women can be more equitably treated within and by science, the last two ask how a science apparently so deeply involved in distinctively masculine projects can possibly be used for emancipatory ends. Where the Woman Question critiques still conceptualize the scientific enterprise we have as redeemable, as reformable, the Science Question critiques appear skeptical that we can locate anything morally and politically worth redeeming or reforming in the scientific world view, its underlying epistemology, or the practices these legitimate.

2 GENDER AND SCIENCE: TWO PROBLEMATIC CONCEPTS

Feminist critics face immense obstacles in trying to construct a theory of gender as an analytic category that is relevant to the natural sciences. These obstacles have their origins not only in familiar but inadequate notions of gender but also in certain dogmatic views about science toward which even feminists are often insufficiently critical.

OBSTACLES TO THEORIZING GENDER

In such other disciplines as history, anthropology, and literature, the need to theorize gender appeared only after the limitations of three other projects were recognized. The "woman worthies" project was concerned with restoring and adding to the canons the voices of significant women in history, novelists, poets, artists, and so forth. Their achievements were reevaluated from a nonsexist perspective. The "women's contributions" project focused on women's participation in activities that had already appeared as focuses of analysis in these disciplines—in abolition and temperance struggles, in "gathering" activities within so-called hunter cultures, in the work of significant literary circles, for instance—but were still misperceived and underdeveloped subject matters. Here, the goal of a less distorted picture of social life logically called for new accounts of these already acknowledged disciplinary subject matters. Finally, "victimology" studies documented the previously ignored or misogynistically described histories and present practices of rape, wife abuse, prostitution, incest, workplace discrimination, economic exploitation, and the like.

It was only in doing such work effectively that feminist scholars came to recognize the inadequacy of these approaches. The situation of women who managed to become significant figures in history or recognized artists and poets was by definition privileged in comparison with women's situation more generally. The lives of these women offer us little more understanding of the daily lives of the vast majority of women than lives of great men reveal the lot of the "common man." Furthermore, women's contributions to traditional history and culture have still been contributions to what men, from the perspective of their lives, think of as history and culture. Such analyses tend to hide from us what women's activities in these men's worlds meant to women, as well as how women's daily activities have shaped men's very definitions of their worlds.¹ Finally, the victimology studies often hide the ways in which women have struggled against misogyny and exploitation. Women have been active agents in their own destinies—even if not within conditions of their own making—and we need to understand the forms and focuses of their struggles. These three kinds of studies have all provided valuable insights into matters that traditional inquiry bypasses. But their limitations led feminists to see the need to formulate gender as a theoretical category, as the analytic tool through which the division of social experience along gender lines tends to give men and women different conceptions of themselves, their activities and beliefs, and the world around them.

In the natural sciences, these projects have been only marginally useful. Women have been more systematically excluded from doing serious science than from performing any other social activity except, perhaps, frontline warfare. The inevitable examples of Marie Curie and now Barbara McClintock notwithstanding, few women have been able to achieve eminence in their own day as scientists. A variety of historical, sociological, and psychological studies explain why this is so, but the fact remains that there are few woman worthies to restore to science's halls of fame. Studies of women's contributions to science have been somewhat more fruitful though still limited by the same constraints.² The victimology focus, which appears in all five of the feminist science critique projects, has proved valuable chiefly in exploding the myth that the science we have had actually is the "science

¹See, e.g., Smith (1974; 1977; 1979; 1981); Kelly-Gadol (1976); Gilligan (1972).

²See, e.g., Rossiter (1982b); Walsh (1977).

The Science Question in Feminism

for the people" (Galileo's phrase) imagined at the emergence of modern science.

The fact that these approaches, useful in the social sciences and humanities, have been able to find only limited targets in the natural sciences has obscured to the science critics the need for more adequate theorization of gender as an analytic category—with one important exception: in the critiques of biology, there have been great advances in providing more developed and accurate views of women's natures and activities (see Chapter 4). Here the need to theorize gender as an analytic category can be seen in identifications of a gap between the way men and women think about reproduction and reproductive technologies, in questions about whether sex difference itself is not an issue of interest more to men than to women, in suggestions that scientific method's focus on differences might be implicated in the androcentrism of such problematics, and in proposals that the concern in biology, anthropology, and psychology with interactive relationships between organisms, and between organisms and environments, may reflect a specifically feminine way of conceptualizing very abstract relationships.³

But biology is only one of the focuses of the feminist critiques of science. In general, the areas in which there is a need for gender as an analytic category and the directions such theorizing should take still remain obscure to many feminist critics of natural science, and totally incomprehensible to most nonfeminist scientists as well as historians, sociologists, and philosophers of science. At least some of these critics do have the resources of their social science disciplines and of literary criticism with which to try to understand natural science in terms of gender categories. The methods of psychoanalysis, history, sociology, anthropology, political theory, and literary criticism have produced valuable insights; however, scientific training (and I include training in the philosophy of science) is hostile to these methods of seeking knowledge about social life, and gender theory is a theory about social

³However, these suggestions raise as many questions as they answer. For instance, does not this approach tend to universalize the feminine, and thereby reinforce problematic modernist tendencies in feminism toward a politics (and epistemology) based on identities rather than solidarities? And are not interactive models the obvious alternative to the hierarchical models of Darwinian dogma? That is, do not reasons internal to the logic of theory development suggest the fruitfulness of pursuing interactive models at this moment in the history of the biological sciences? Furthermore, does not the desire to replace hierarchical with interactive models reflect widely recognized political realities at this time in world history, rather than only feminine characteristics? We shall pursue these questions later.

life. Characteristically, neither scientists nor philosophers of science are socialized to value psychoanalysis, literary criticism, or the critical interpretive approaches to be found in history and anthropology as modes of knowledge-seeking. No wonder we have found it difficult to theorize the effects on the natural sciences of gender symbolism, gender structure, and individual gender.

In the social sciences, those areas of research most hospitable to the introduction of gender as a theoretical category are the ones with a strong *critical* interpretive tradition. (I say "critical" to distinguish this *theory* of human action and belief from the kinds of unselfconscious interpretations, rationalizations, we all routinely provide to ourselves and others in explaining our beliefs and actions.) These traditions hypothesize that "the natives" may sometimes engage in irrational actions and hold irrational beliefs that defeat the actors' conscious goals and/or unconscious interests. The causes are to be found in the contradictory social conditions, the no-win situations, within which humans must choose actions and hold beliefs. Marx and Freud provide just two examples of theorists who attempted to identify the social conditions that lead groups of individuals to patterns of irrational action and belief. The effects of their methodological proposals can be seen in the critical interpretive traditions in many areas of social science research—whether or not these traditions call themselves Marxist or Freudian or are concerned with the particular kinds of social phenomena of interest to Marx and Freud. In these inquiry traditions it is legitimate—indeed, often obligatory—to reflect on the social origins of conceptual systems and patterns of behavior, and to include in this subject matter the conceptual systems and behaviors shaping the inquirer's own assumptions and activities. Here there is not only conceptual space but also, we might say, moral permission to reflect on gendered aspects of conceptual systems and on the gender circumstances in which beliefs are adopted. In contrast, research programs where remnants of empiricist, positivist philosophies of social science hold sway have been systematically inhospitable to gender as a theoretical category.⁴ At best they have been willing to add gender as a

⁴See Stacey and Thorne (1986), who make a number of these points about sociology. Pauline Bart has also pointed out (in conversation) that in speculating about the comparative resistances that different disciplinary fields offer to feminist insights, we should not underestimate the comparative levels of personal and political threat to the leaders in these fields—primarily men—that are presented, for instance, by sociological analyses of contemporary and nearby cultures in comparison to historical or anthropological analyses of cultures temporally or spatially distant from us. This line of reasoning

The Science Question in Feminism

variable to be analyzed in their subject matter—as a property of individuals and their behaviors rather than also of social structures and conceptual systems.

The physical sciences are the origin of this positivist, excessively empiricist philosophy. Their nonsocial subject matter and the paradigmatic status of their methods appear to preclude critical reflection on social influences on their conceptual systems; indeed, prevalent dogma holds that it is the virtue of modern science to make such reflection unnecessary. We are told that modern physics and chemistry eliminate the anthropomorphizing characteristic of medieval science and of the theorizing we can observe in “primitive” cultures and children—not to mention in the social sciences and humanities. The social progressiveness, the “positivism,” of modern science is to be found entirely in its method. There is thought to be no need to train physicists, chemists, or biologists as critical theorists; consequently, little in their training or in the ethos of scientific endeavor encourages the development or appreciation of the critical interpretive theory and skills that have proved so fruitful in the social sciences.

However, the history, sociology, and philosophy of science are not themselves natural sciences. Their subject matters are social beliefs and practices. In the philosophy of science, the focus is on ideal beliefs and practices; in the history and sociology of science it is on actual beliefs and practices. Whether ideal or real, social beliefs and practices are the concerns of these disciplines. Here one would have thought that critical interpretive theory and skills would be central to understanding how scientists do and should explain the regularities of nature and their underlying causal tendencies. The sociology of knowledge does take this approach, though it has been limited by its preoccupation with what we can call the “sociology of error” and the “sociology of knowers” to the exclusion of a sociology of knowledge.⁵ And this tradition, too, has been stalwartly androcentric. But androcentric or not, its influence on thinking about natural science has yet to be felt within the philosophy of science or the natural sciences themselves, and is only beginning to make inroads into the traditional sociology and history of science. The philosophy, sociology, and history of the natural sciences have been dominated by empiricist philosophies hostile

would support my argument that feminist critiques of the natural sciences meet even greater hostility than critiques in other areas; scientific rationality is directly implicated in the maintenance of masculinity in our kind of culture.

⁵See Bloor (1977) for criticism of the sociologies of error and knowers.

to theories of belief formation within which gender could be understood as a part of science’s conceptual schemes, as a way of organizing the social labor of science, or as an aspect of the individual identity of scientists.

For these reasons the feminist science critics face even greater disciplinary obstacles than do feminists who seek to introduce gender as a theoretical category into the social sciences, literature, and the arts. These obstacles seem to originate in the unusual notion that science enthusiasts have of the proper way to understand the history and practices of science: this kind of social activity alone, we are told, must be understood only in terms of its enthusiasts’ understanding of their own activities—in terms of the unselfconscious, uncritical interpretations “the natives” provide of their beliefs and activities. That is, scientists report their activities, and philosophers and historians of science interpret these reports so that we can “rationally” account for the growth of scientific knowledge in the very same moral, political, and epistemological terms scientists use to explain their activities to funding sources or science critics.

Social theorists will recognize this approach as a hermeneutic, intentionalist one that systematically avoids critical examination of the identifiable causal, historical influences on the growth of science which are to be found outside the intellectual, moral, and political consciousnesses of science practitioners and enthusiasts.⁶ Kuhn’s alternative account of the history of science has generated a veritable new industry for the social studies of science, studies that have begun to show the mystification perpetrated by such “rational reconstructions.”⁷ But traditional science and philosophical and popular enthusiasm for the traditional vision of science remain pugnaciously hostile to such critical causal accounts. From this perspective, my approach to science in this book may be understood as a more thorough naturalism than science enthusiasts themselves are apparently willing to defend: I seek to identify the causal tendencies in social life that leave traces of gender projects on all aspects of the scientific enterprise.

Is it ironic that natural science, presented as the paradigm of critical, rational thinking, tries to suffocate just the kind of critical, rational thought about its own nature and projects that it insists we must exercise about other social enterprises? Perhaps not, if we think of

⁶See Fay and Moon (1977) for discussion of the virtues and problems of intentionalist approaches to social inquiry.

⁷Kuhn (1970).

The Science Question in Feminism

science's story about itself as a kind of origins myth. Science's self-image presents a myth about who "our kind" of people are and about what destiny nature and scientific rationality hold in store for us. As anthropologists tell us, origins myths frequently violate the very categories they generate: in other cultures they may report that those cultures came into existence through incest, cannibalism, bestiality, sexual unions between gods and mortals—activities subsequently forbidden in those cultures. The origins myth for our scientific culture tells us that we came into existence in part through the kind of critical thought about the social relations between medieval inquiry and society that is subsequently forbidden in our scientific culture. This is a magical—perhaps even a religious or mystical—conception of ideal knowledge-seeking. It excludes itself from the categories and activities it prescribes for everything else. It recommends that we understand everything but science through causal analyses and critical scrutiny of inherited beliefs.

THE DOGMAS OF EMPIRICISM

Empiricist conceptions of scientific method and the scientific enterprise create obstacles both *for* and *in* feminist thinking about science. I suggest that we should regard these mystifying beliefs as reflections of and additions to the "dogmas of empiricism" familiar to philosophers.

In the 1950s, the philosopher of science Willard Van Orman Quine identified two dogmas of empiricism that he thought should be abandoned. "Modern empiricism has been conditioned in large part by two dogmas. One is a belief in some fundamental cleavage between truths which are *analytic*, or grounded in meanings independently of matters of fact, and truths which are *synthetic*, or grounded in fact. The other dogma is *reductionism*: the belief that each meaningful statement is equivalent to some logical construct upon terms which refer to immediate experience."⁸ Quine argued that both dogmas were illfounded, and that if they were abandoned, we would be inclined to see as less clear the purportedly firm distinction between natural science and speculative metaphysics. We would also recognize pragmatic standards as the best we can have for judging the adequacy of scientific claims.

Since then, historians and sociologists of science as well as philosophers have supported Quine's rejection of these two dogmas of em-

piricism. Studies of the social construction of what we count as real—both inside and outside the history of science—make it highly implausible to believe that there can be any kind of value-free descriptions of immediate experience to which our knowledge claims can be "reduced" or thought equivalent. Furthermore, there is now widespread acceptance of Quine's first claim that when epistemological push comes to shove, we can never tell for sure when we are responding to the compulsions of our language rather than to those of our experience. Facts cannot be separated from their meanings. Thus the test of the logical adequacy of a statement or argument is ultimately not different in kind from tests of its empirical adequacy. In both cases, (social) experience expressed through (culturally shaped) language is all we have to fall back on. (Quine was not concerned with what creates social variation in experience or language.) Quine recommended substituting pragmatic and behaviorist questions for the traditional philosophical ones, replacing what he thought were undesirable philosophical preoccupations with what he thought were desirable scientific ones. We can appreciate the pragmatic tendencies in his thinking without having to agree to his behaviorism—to his program for replacing philosophy with what appears to many theorists as a still far too reductionist and obsessively empiricist social science.

The philosophical preoccupations that concerned Quine were developed in their contemporary forms to explain the emergence of modern science;⁹ philosophers and scientists explicitly honored those dogmas. However, both the resistance of the natural sciences to a feminist critique and the many theoretical and political contradictions within the feminist critiques make clear that by no means have the dogmas Quine identified been abandoned—nor are there only two—in either scholarly or popular thinking about science.

Here I want to discuss a series of reflections of and additions to the assumptions Quine criticized which stand as conceptual obstacles to our ability to analyze science, too, as a fully social activity. I think these excessively empiricist beliefs still haunt most of the feminist critics of science and prevent us from adequately theorizing gender in feminist discussions of science. Furthermore, it is belief in these dogmas that leads scientists and traditional philosophers and historians to be hostile to the very idea of a feminist science critique.

⁹See Rorty (1979).

⁸Quine (1953, 20).

Sacred Science.

I have already hinted at one of these dogmas: the belief that science is a fundamentally unique kind of social activity. Like other kinds of origins stories, the ideology of science claims that science properly violates the categories it generates. We are told that human understanding is decreased rather than increased by attempting to account for the nature and structure of scientific activity in the ways science recommends accounting for all other social activity. This belief makes science sacred. Perhaps it even removes scientists from the realm of the completely human—at least in their own view and the view of science enthusiasts. It sets limits on human rationality for what are best thought of as religious or mystical reasons.

We can illustrate that the problem lies in inadequate conceptions of scientific rationality rather than in specifically feminist claims by considering the following hypotheses—which do not even refer to gender.

A. The predictable contribution that physics could make to social welfare today is relatively negligible, since moral and political injustices, rather than ignorance of the laws of nature, are the greatest obstacles to social welfare.

B. “More science” in a socially stratified society tends to intensify social stratification.

C. While individual scientists may well be motivated by the loftiest of personal goals and social ideals, their current activity in fact functions primarily to increase profit for and maintain social control by the few over the many.

These claims may be true or false; I think they are closer to truth than to falsity. Determining their truth or falsity—their correspondence with the way the world is—should be considered a matter for empirical investigation. Yet these statements appear blasphemous to the vast majority of both scientists and nonscientists—not bold hypotheses that should be scientifically investigated to determine whether or not they can be refuted but psychologically, morally, and politically threatening challenges to the Western faith in progress through increased empirical knowledge. They also appear as challenges to the intelligence and morals of the very bright and well-intentioned women and men who enter and remain in science. The usual responses to such suggestions are raised eyebrows, knowing smiles (not directed toward the speaker), or overtly hostile glares—responses that are hardly paradigms of rational argument. Alternatively, listeners may indicate that

they think they are hearing simply expressions of personal hurt: “You must hate scientists,” they reply—as if only disastrous personal experience or a warped mind could make such hypotheses worth pursuing. These kinds of statements raise the possibility not just of an interesting empirical discovery that we have been in error about the progressiveness of science today but of a painful, world-shattering confrontation with moral and political values inconsistent with those that most people think give Western social life its desirable momentum and direction. Obviously, more is at issue here than checking hypotheses against facts—just as more was at issue in the social acceptance of the Copernican world view than the relationship between Copernicus’s hypotheses and the evidence to be gained by looking through Galileo’s telescope.

The project that science’s sacredness makes taboo is the examination of science in just the ways any other institution or set of social practices can be examined. If one substituted “novels,” “drama,” “marriage,” or “publicly funded education” for “science” in these claims, many people might be outraged (or consider the claims merely silly), but the hypotheses would not then generate the same deep feeling of threat to our moral, political, and psychological intuitions. Why is it taboo to suggest that natural science, too, is a social activity, a historically varying set of social practices? that a *thoroughgoing* and *scientific* appreciation of science requires descriptions and explanations of the regularities and underlying causal tendencies of science’s own social practices and beliefs? that scientists and science enthusiasts may have the least adequate understanding of the real causes and meanings of their own activities? To what other “community of natives” would we give the final word about the causes, consequences, and social meanings of their own beliefs and institutions? If we are not willing to try to see the favored intellectual structures and practices of science as cultural artifacts rather than as sacred commandments handed down to humanity at the birth of modern science, then it will be hard to understand how gender symbolism, the gendered social structure of science, and the masculine identities and behaviors of individual scientists have left their marks on the problematics, concepts, theories, methods, interpretations, ethics, meanings, and goals of science.

Let us pursue for a moment the way this belief in the sacredness of science is defended. Science and society are analytically separate, we are told. Thus social values are distinct from (and detrimental to the determination of) facts; the meanings scientific statements carry in a

The Science Question in Feminism

culture are distinct from (and irrelevant to) what scientific statements actually say; consideration of the social uses and abuses of science are distinct from (and irrelevant to) assessments of the progressiveness of science; the social origins of scientific problematics, concepts, theories are distinct from (and irrelevant to) the "goodness" of these problematics, concepts, and theories. These beliefs are defended in one form or another every time a social criticism of science appears. Furthermore, these beliefs permit continual discussions in which the languages, meanings, and structures of science are assumed to be uniquely asocial, as a quick perusal of any of the standard philosophy of science journals or texts will reveal. These beliefs structure the internalist vs. externalist dispute in the history of science; they ensure that most science enthusiasts will mean by "history of science" only the history of consciously held scientific beliefs.

Defenders of the analytic separateness of science from society will say that maybe science is not immune from *all* kinds of social influences; anyone can see that idiosyncrasies of individual investigators have influenced the history of science—otherwise, why would we give Nobel prizes to some individuals and not to others? And yes, the funding priorities of the economy and state do influence the selection of problematics. And it's also true that shoddy research sometimes survives longer than it should because of social enthusiasm for the ill-begotten interpretations of its results: think of Lysenkoism and "Nazi science," they say. And of course enthusiasm for modern science is fundamentally motivated by democratic social values: science is constituted by certain social values, but at its best it neither defends nor recommends any particular social values.

What the defenders of the fundamental value-neutrality, the purity, of science really mean, they say, is that science's logic and methodology, and the empirical core of scientific facts these produce, are totally immune from social influences; that logic and scientific method will in the long run winnow out the factual from the social in the results of scientific research. But we shall try to locate the pure, value-free core of science responsible for the purportedly inherent progressiveness in scientific method, in model claims in physics, in the mathematical language of science, and in logical reasoning. If, as I shall argue, pure science cannot be found in these places, then where should we try to find it?

We do know where to find the historical origins of the mystical belief that science's inherent progressiveness resides in the separation of its

logic and its facts from its social origins, social uses, and social meanings; Chapter 9 examines the political reasons for its adoption. Prior to Newton, such a positivist view of science did not exist (though the term "positivism" appeared much later, the idea can already be detected in late seventeenth-century thinking). The separation does not in fact exist today, but its fetishization lingers on.

Science as a Unique Method or a Set of Sentences.

Does the feminist case that science is gendered have to rest on showing scientific method to be sexist? Does a degendered science have to produce a new method of knowledge-seeking? Or does the feminist case have to rest on showing that the best confirmed claims the sciences have made are sexist? Does it have to show that Newton's or Einstein's laws are sexist in order to provide a plausible argument for the gendered nature of science?

The common view (or dogma) is that science's uniqueness is to be found in its method for acquiring reliable descriptions and explanations of nature's regularities and their underlying causes. Authors of science texts write about the importance of value-free observation as the test of beliefs, and especially about collecting observations through the "experimental method." We are told that it is the refined observation characteristic of experimental method that permitted Galileo's and Newton's views to win out over Ptolemy's and Aristotle's.

But exactly what is unique about this method remains obscure. For one thing, the different sciences use different methods; not a great deal is common to the methods of astronomy, particle physics, and molecular biology. For another thing, in parts of what are regarded as highly rigorous and value-free sciences—contemporary astronomy and geology, for example—controlled experiment plays an extremely small role. And controlled experiment is not a modern invention—after all, Aristotle was an experimentalist. Moreover, just try to identify the formal methodological features of knowledge-seeking that will exclude from the ranks of scientists farmers in premodern agricultural societies yet will include junior but highly trained members of biochemical research teams. When push comes to shove in the philosophy of science, we are told that induction and deduction are supposed to compete for honors as the core of scientific method.¹⁰ But presumably, human infants as well as apes and dogs regularly use induction and deduction.

¹⁰Popper (1959; 1972); cf. Harding (1976).

These kinds of considerations lead to the suspicion that science is both more and less than any possible definition of scientific method.

Faced with these kinds of arguments, one leading philosopher of science says that what distinguishes scientific from nonscientific explanation is science's *attitude* toward its claims.¹¹ That is, what makes a belief or activity scientific is the psychological stance one takes toward it. In all other kinds of human knowledge-seeking, we can identify assumptions that are regarded as sacred, as immune from refutation by experience; the explanations offered by non-Western, "primitive" cultures, theology, psychoanalytic theory, Marxist political economy and astrology are the favorite examples of such pseudoexplanations. We are told that only science holds all of its beliefs open to refutation by experience.

However, in particular areas of scientific inquiry the immunity to criticism of grounding assumptions is easily demonstrated. Why should the situation be different for the scientific world view as a whole? How about (one is tempted to ask) the belief that there are no uncaused physical events? Or that we can meaningfully distinguish between the world's physical and nonphysical events or processes?

In light of these kinds of considerations, it is hard to see why a distinctively feminist science would have to produce a new method, at least if we mean by scientific method no more than (1) putting beliefs to the test of experimental observation, (2) relying on induction and deduction, or (3) being willing to hold all of our assumptions open to criticism. The first and second of these activities are not at all unique to modern science, and the second and third are not characteristic of what everyone counts as the most methodologically rigorous inquiry. What we have in this dogma is the reduction of the purportedly inherent progressiveness of science to a mythologized and obscure notion of its method (this should be—but is not always—what feminists criticize when they challenge positivism), but the distinguishing features of this scientific method cannot even be specified in a plausible way.

A second obscuring conception can be found in the history of the philosophical and scientific preoccupation with science as a particular paradigmatic set of sentences. The mathematical expressions of Newton's laws of mechanics or Einstein's theory of relativity are two of the most frequently cited examples. Unless critics can show that these mathematical statements are value-laden, it is claimed, no case at all

can be made for the hypothesis that the science we have is fundamentally suffused with social values—let alone with gender values. But why should we continue to regard physics as the paradigm of scientific knowledge-seeking? And is it true that mathematical statements bear no social fingerprints—that there is such a thing as pure mathematics?

Paradigmatic Physics.

Physicists, chemists, philosophers of science, and most of the rest of us believe that physics is the paradigm of science, and that science without physics as its paradigm is unimaginable. Minds reel at the suggestion that perhaps, in the science of the future, physics will be relegated to the backwaters of knowledge-seeking and thought to be concerned only with esoteric problems that have little impact on how we live. Perhaps even today its problematics, methods, and favored languages already provide distinctly atypical examples of scientific inquiry that should not be models for other areas. We can entertain this thought even while we appreciate the historical reasons why physics has been the paradigm of scientific inquiry: Newton's physics permitted a far more useful understanding of many kinds of phenomena than did the Aristotelian physics it replaced, and its explanatory success created great optimism that Newton's "method" could produce similar success in every area of human inquiry. Indeed, mechanism, the metaphysics of Newton's laws, still guides useful research in many areas of the physical sciences, though its limitations are becoming increasingly apparent. However, as Kuhn pointed out, paradigmatic theories in particular areas of inquiry eventually wear out as fruitful guides to research. Shouldn't this also be true for science as a whole?

If it is reasonable to believe that physics should always be the paradigm of science, feminism will not succeed in "proving" that science is as gendered as any other human activity unless it can show that the specific problematics, concepts, theories, language, and methods of modern physics are gender-laden—especially, one hears from philosophers, mathematicians, and physicists, that the mathematical expressions of Newton's laws of mechanics and Einstein's relativity theory are gender-laden. Here, surely, we can distinguish the value-neutral logical structure and empirical content of scientific belief from its social origins, meanings, and applications. From this perspective, the feminist science critiques appear to have as their targets only the "less rigorous" or "less mature" biological and social sciences. Resistance to the plausibility of the feminist critique is made to rest on the value-

¹¹Popper (1959; 1972).

The Science Question in Feminism

neutrality of mathematical expressions of the laws of physics. Thus feminist criticisms can appear to support the claim that specific examples of sexist and androcentric science are only cases of "bad science"; that greater attention to the methodological constraints modeled by physics for all inquiry would result in a science free of sexism and androcentrism.

The fact is, however, that all the reasons social scientists have given for thinking that social inquiry requires fundamentally different metaphysical assumptions and methods from those of inquiry in physics can be understood as reasons for thinking that the status of physics as the model of science should deteriorate.¹² I will argue that a critical and self-reflective social science should be the model for all science, and that if there are any special requirements for adequate explanations in physics, they are just that—special. (We will see that much of biology should already be conceptualized as social science. Thought of as the bridge between—or, from a postmodernist perspective, the crucible in which are forged—the natural and the social, nature and culture, biology must frequently make kinds of metaphysical and methodological assumptions that are foreign to physics and chemistry.) Let us see how the arguments about the different conditions for adequate social inquiry can be transformed into arguments for regarding the conditions of scientific explanation in physics as nonparadigmatic.

In the first place, the subject matter of physics is so much less complex than the subject matters of biology and the social sciences that the difference amounts to a qualitative rather than just a quantitative one. Physics looks at either simple systems or simple aspects of complex systems. The standard model of the solar system is an example of the former; the aspects of physiological or ecological systems that physics can explain are examples of the latter. A major reason for the simplicity of these systems and the ability of their models to make reliable predictions is that they are conceptualized as self-contained and deterministic. Yet human activity can have consequences for the functioning of the solar system—we could, presumably, blow up this planet. But the regularities and causal tendencies of such kinds of "interference" are not supposed to be the professional concern of physicists. Whereas the social sciences must consider physical constraints on the phenomena they examine, the objects, events, and processes of

concern to physical scientists are limited to those that can be isolated from social constraints.

Second, the concepts and hypotheses of physics require acts of social interpretation no less than do those in the social sciences. The social meanings that explanations in physics have for physicists and for the "man and woman in the street" are necessary components of these explanations, not scientifically irrelevant historical accidents. Perhaps it is appealing to imagine that the mathematical formulations of Newton's laws *are* the explanations of the movements of matter because it takes only a little effort for us modern folk to get a sense of what these formulas mean in ordinary language. But should we think of a formula so long that only a computer could read it in one hour as an *explanation* of a type of phenomenon? The answer to this question is "no." An explanation is a kind of social achievement. A purported explanation that cannot be grasped by a human mind cannot qualify as an explanation. If no human can understand, can hold in the mind, the purported explanation, then explanation has not been achieved. In other words, Newton's explanations include not just the mathematical expressions of his laws but also the interpretations of those formulas that let us know when we have cases in front of us that exemplify the formulas. The formula " $1 + 1 = 2$ " is meaningless unless we are told what is to count as a case of 1, of +, of =, and so on. The history of chemistry can be understood in part as the struggle to determine what should count as the 1's, the +'s, and the ='s of chemical "addition." And it is not just in physics and chemistry that the appropriate meanings and referents for such apparently obvious terms are debated. As a famous physicist is alleged to have remarked, if we put one lion and one rabbit in a cage, we rarely find two animals there one hour later! Scientific formulas are like legal judgments: the laws become meaningful only through learning (or deciding) how to apply them, and doing so is a process of social interpretation.

We can see another way in which social interpretation is a fundamental component of the laws of physics if we think about the fact that we, unlike fifteenth- to seventeenth-century Europeans, no longer find it bizarre or morally offensive to conceptualize nature as a machine. This analogy has become so deeply embedded in our cultural consciousness that no longer are we aware when we draw on it. But we do not think of concepts or hypotheses "interpreted" through *unfamiliar* social analogies as contributing to explanations. "Nature is like a 'speak bitterness' meeting" might conceptualize nature in a way that could

¹²See Fay and Moon (1977) for a review of how mainstream philosophers think about the differences between the physical and social sciences.

The Science Question in Feminism

fruitfully guide scientific inquiry in some cultures but not in ours (perhaps Chinese ecologists might find this a useful metaphor). An "explanation" we cannot grasp is not an explanation. A theory's interpretation may overtly appeal to social or political metaphors at one time and not at another, but *some* social act of interpretation is necessary if we are to understand how to use the theory. Interpretation of formal "texts" through socially familiar models and analogies is central to explanations in physics.¹³

In the third place, whereas the evolutionary biologist or economic geographer must take into account purposeful and learned activities by humans and perhaps even members of other species—nonhuman feeding and mating preferences, for example—the physicist need not consider self-reflective and intentionally directed causes of the motions of mere matter. He need not do so because the observable regularities of "matter in motion" do not have these kinds of causes. I mention evolutionary biology and economic geography to indicate how deeply the social extends into what we think of as the natural. After all, explanations of apes' adaptation to (perhaps we should say "creation of") their environments and of patterns of forestation at least since our species came into existence must include considerations of just the kind of purposeful and learned behaviors (dare we say "activities"?) that are the subject matter of social inquiry. Insofar as the world around us continues to become more and more suffused with the presences and residues of social activities, there is less and less "out there" amenable to the kinds of explanations that have been so fruitful in physics. The history of the "progress" of our species is simultaneously the history of the disappearance of pure nature. I need hardly even mention the silliness of assuming that physics can provide the model for anthropological explanations of all we want to know about the regularities and underlying causal tendencies creating different kinds of kinship structures, or for historical explanations of all we want to know about the regularities and underlying causal tendencies in relationships between, say, forms of child rearing and forms of the state. I suggest that the totally reasonable exclusion of intentional and learned behaviors from the subject matter of physics is a good reason to regard inquiry in physics as atypical of scientific knowledge-seeking.

Finally, explaining social phenomena requires the interpretive skills

¹³Later (esp. Chapter 9) I examine the use of androcentric metaphors, models, and analogies in the history of Western science, and the inadequate account of the nature and functions of these figures of thought in the philosophy of science.

necessary to grasp the meanings and purposes an intentional act has for the actor—skills that have no analogue in physics. Indeed, the differences between the ontological assumptions and methods appropriate for physics and social inquiry are even more extensive than such a statement indicates. In social inquiry we also want to explain the origins, forms, and prevalence of apparently irrational but culturewide patterns of human belief and action. Freud, Marx, and many later social theorists have taken just such culturewide irrationality as their subject matter. Why, then, should we take as the model for all knowledge-seeking a science that has no conceptual space for considering irrational behavior and belief? Moreover, possibly explanations even in physics would be more reliable, more fruitful, if physicists were trained to examine critically the social origins and often irrational social implications of their conceptual systems. For instance, would not physics benefit from asking why a scientific world view with physics as its paradigm excludes the history of physics from its recommendation that we seek critical causal explanations of everything in the world around us? Only if we insist that science is analytically separate from social life can we maintain the fiction that explanations of irrational social belief and behavior could not ever, even in principle, increase our understanding of the world physics explains.

I have been suggesting reasons for reevaluating the assumption that physics should be the paradigm of scientific knowledge-seeking. If physics ought not to have this status, then feminists need not "prove" that Newton's laws of mechanics or Einstein's relativity theory are value-laden in order to make the case that the science we have is suffused with the consequences of gender symbolism, gender structure, and gender identity. Instead, we should regard physics as simply the far end of the continuum of value-laden inquiry traditions. Even though there are good historical reasons why physics gained such a central position in the thinking of philosophers and scientists, we need to ask whether its paradigmatic status today should be regarded as anachronistic, and as a reflection of distinctively androcentric, bourgeois, and Western concerns.

Let me emphasize that I do not intend to direct attention away from attempts to show how Newton's and Einstein's laws of nature might participate in gender symbolization. Improbable as such projects may sound, there is no reason to think them in principle incapable of success. Such successes would make immensely more plausible the feminist claims that the natural sciences, too, are deeply gender-biased.

In Chapters 5, 8, and 9, in examining some of the androcentric and bourgeois social values that have in fact been projected onto nature, I will show that modern astronomy and physics anthropomorphize nature no less than did the medieval sciences they replaced. But here I am making a different point. I am arguing that such a project need not be undertaken in order to convince us that modern science is androcentric. Instead, we should understand physics not as the model for all scientific inquiry, but as atypical of inquiry just insofar as its ontological and methodological assumptions can in fact secure value-free results of research.

Pure Mathematics.

The belief that mathematics has no formal social dimensions—that the “external” social history of mathematics has left no traces on its “internal” intellectual structures—provides grounds for regarding science as fundamentally a set of sentences (such as Newton’s laws) and physics as the paradigmatic science. For if the nature that modern physics describes and explains “speaks in the language of mathematics” (as Galileo claimed), and if the cognitive content of mathematics has no social characteristics, then the formal statements of physics must also have no social characteristics. We have already argued that explanations in physics cannot be “reduced” to mathematical “sentences” shorn of social interpretation. But the dogmatists’ case for a value-neutral core of pure science is even weaker than that argument suggests. Even if one could “reduce” the laws of physics to mathematical expressions, there are not sufficient reasons to think that those mathematical expressions themselves are value-free.

Of course, everyone knows that the field of mathematical inquiry has a social history. Different mathematical problems preoccupied different historical groups of mathematicians. We are told that different concepts, calculation strategies, and methods of proof were “discovered” at identifiable historical moments. But we are also told that this social history of mathematics is entirely external to the cognitive structures, the logical structures, of mathematics. The social history of mathematics is said to leave no traces on its logical structures. These “discoveries” are presented as merely examples of the always cumulative and progressive growth of mathematical knowledge.

It is sometimes claimed that if feminism is to show the value of using gender as a category to analyze science, it must show that mathematical concepts and methods of proof are androcentric, and it must

produce an alternative, feminist mathematics; perhaps feminists must even show that modern logic is sexist and that there could be a nonsexist alternative logic. This argument satisfies its makers that they have reduced to an absurdity both the very idea of a radical feminist critique of the scientific world view and the possibility of an alternative science guided by feminist principles.

I will not argue that mathematics is, in fact, *male*-biased; but two considerations make it plausible to regard as mythical the possibility of *pure* mathematics. In the first place, no conceptual system can provide the justificatory grounds for itself. To avoid vicious circularity, justificatory grounds always must be found outside the conceptual system one is trying to justify. The axioms of mathematics are no exception to this rule. Leading mathematical theorists point out that the ultimate test of the adequacy of a mathematical concept or proof always has been pragmatic: Does it “work” to explain the regularities in the world for which it was intended to provide an explanation? The history of the last two centuries of the philosophy of mathematics can be seen as the history of the struggle to arrive at this pragmatic understanding of the nature of mathematical “truths.” Our interests here do not permit a review of this history.¹⁴ But on the basis of this now widespread (if not totally convincing to all mathematicians) understanding of the status of mathematical “truths,” we should think of “discoveries” in the history of mathematics as responses to the recognition that mathematical concepts and theories, too, are tested against the historical social worlds they are designed to explain.

In the second place, in support of this kind of argument, historians of mathematics have pointed to the reasons why mathematical statements regarded as true at one time in history are occasionally regarded as false at a later time. They show that the plausibility or usefulness of what have sometimes appeared as impossible, contradictory, mathematical concepts has had to be socially negotiated.¹⁵ One kind of social imagery for thinking about mathematical objects comes to replace another. For example, the ancient Greeks—no mean mathematicians—did not regard one, the first in a series of integers, as a number, nor did they consider it either odd or even. We, of course, think of it as

¹⁴See the accounts provided by Kline (1980) and Bloor (1977). Kline argues that Andrzej Mostowski, Hermann Weyl, Haskell B. Curry, John von Neumann, Bertrand Russell, Kurt Gödel, and Quine are among the eminent mathematicians and logicians who have defended a pragmatic view of mathematical truth.

¹⁵See Bloor (1977) for discussion of these cases.

a number, and as an odd number, because unlike the ancient Greeks, we are not mathematically interested in the distinction between the first, or generator, of a lineage (here of integers) and the lineage generated. Theologies and origins stories frequently invoke such a distinction. In mathematics, we have come to see the distinction between the generator of a lineage and the lineage generated as a distinction originating in certain kinds of social beliefs that modern mathematics need not honor. (However, scientists and philosophers who insist that science itself in principle cannot have some of the characteristics possessed by the world that science explains—illumination by causal explanation, social values in the explanatory artifacts physicists produce, and the like—still retain belief in the importance of this kind of distinction, as I noted. If we no longer can find reasons to honor this religious distinction in mathematics, why should we honor it in the philosophy and social studies of science?)

Let us consider one more example. Common sense tells us that a part cannot be equal to the whole. Thus it is only relatively recently that mathematicians have been able to countenance the idea that the integers could be infinite in number. Earlier mathematicians' problem was as follows: one can match each sequential integer with an even integer (1-2, 2-4, 3-6, 4-8, . . .), resulting in an infinite series in which there are as many even integers as there are integers—at first glance an absurdity. How was this paradox resolved? Mathematicians were willing to let go of the common sense truth that a part cannot be equal to the whole for this special circumstance in order to develop infinitesimal theory. They did so by replacing the social image of numbers as counting units with the social image of numbers as divisions of a line. These are *social* images because they reflect what people in historical cultures intentionally do. Not all cultures have been as preoccupied with measuring—dividing a line—as has ours for the last few centuries. A whole field of mathematical inquiry was made possible by the substitution of a different kind of social image for thinking about what numbers are. As one commentator points out, such a process of socially negotiating cultural images in mathematics is similar to what we do when we exclude patriotic killing in wartime from the moral and legal category of murder.¹⁶

We could look at these developments in mathematics simply as the onward and upward march of truth in the service of intellectual prog-

¹⁶Bloor (1977, 127). Frances Hanckel's comments improved this discussion.

ress. But to do so hides the social imagery within which numbers and other mathematical notions have been conceptualized, and the very interesting processes of social negotiation through which one cultural image for thinking about mathematical concepts comes to replace another. Counting objects and partitioning a line are common social practices, and these practices can generate contradictory ways of thinking about the objects of mathematical inquiry. It may be hard to imagine what gender practices could have influenced the acceptance of particular concepts in mathematics, but cases such as these show that the possibility cannot be ruled out a priori by the claim that the intellectual, logical content of mathematics is free of all social influence.

"Well, at least mathematics is ultimately grounded by logic; and logic is free of social influence," our diehard dogmatist may claim. Mathematicians in this century, however, have found it impossible to justify the axioms of mathematics with any logical principles that are not more dubious, more counterintuitive, than the mathematics they are supposed to justify. So it is doubtful that the duty of providing a firm grounding for the truths of mathematics can be assigned to logic. Moreover, a few feminists have proposed ways in which specific assumptions in logic are androcentric. Merrill Hintikka and Jaakko Hintikka, for example, argue that the metaphysical units of a branch of logic called "formal semantics" correspond to masculine but not feminine ways of individuating objects.¹⁷ Such studies provide invaluable glimpses of social fingerprints on supposedly pure formal thought and suggest fruitful research programs for the future.

But even if these studies did not exist or no more were produced, it is hard to see why the case for theorizing gender as an analytic

¹⁷Hintikka and Hintikka (1983). Another kind of problem in logic was revealed by Janice Moulton in "The Myth of the Neutral 'Man'" in *Feminism and Philosophy*, ed. M. Vetterling-Braggin et al. (Totowa, N.J.: Littlefield Adams, 1977). She pointed out that in a standard English example of a valid syllogistic form—"All men are mortal; Socrates is a man; therefore, Socrates is mortal"—the term "man" in fact is used with two different referents (generic in the first statement; gender-specific in the second), and thus that the standard English interpretation of this syllogism, *used in every logic text for several centuries*, is invalid. The clue to the fact that there are an illicit four, instead of three, terms in this interpreted syllogism is that one can not substitute the name of any and every other "man" (human) for "Socrates" without eliciting a "bizarreness response"; for instance, "Cleopatra is a man" elicits such a response. (The syllogism would, of course, be valid if "men" in the first premise were used in the gender-specific sense; but this does not accurately represent the original Greek, and is not what logicians have intended.) What other androcentric and therefore illicit interpretations of logical forms lurk in logic texts? No wonder many "female men" have had inarticulate resistance to grasping the virtues of logic courses!

The Science Question in Feminism

category in our thinking about science would have to rest on the possibility of producing such analyses of mathematics and logic. My point, again, is not to discourage such studies but to indicate the counter-productiveness (the irrationality!) of this argumentative strategy. This kind of resistance to feminist critiques pays the price of reducing science to mathematical or logical statements, thereby managing to contradict the fundamental assumption that assessments of the adequacy of scientific claims should depend on the detectable relationship of those claims to our observations of the world. It should be sufficient to point out that mathematics is so useful to physics, more limitedly useful in biology or economics, and only rarely useful in anthropology or history because of the relative degrees of simplicity, abstraction, and intentional and irrational behaviors characteristic of the subject matters in these fields of inquiry. Pursuing Quine's turn to pragmatism, we could say that mathematics, like logic, simply "looks at" aspects of the world that are less distorted by formal description than does anthropology or history—less distorted, but not entirely free of distortion.

We have been examining conceptions of scientific claims and of scientific activity that are problems both for and in feminist theory. They are problems *for* feminist theorizing because they block the possibility of feminist transformations in the way scientists, philosophers, and social theorists think about science. They are problems *in* feminist theorizing because belief in at least traces of these dogmas hides from us the inadequacies in our understanding of how science is gendered.

GENDER: INDIVIDUAL, STRUCTURAL, SYMBOLIC—
AND ALWAYS ASYMMETRIC

Inadequate conceptualizations of gender are also a problem both for and in the feminist science critiques. The inadequacies within the critiques reflect in two ways the partial, and even perverse, understandings of gender that are characteristic of mainstream thinking. The first results from an excessive focus on just one or two of the forms in which gender appears in social life, obscuring the sometimes mutually supportive and sometimes oppositional but always important relationships in any given culture between the preferred expressions of gender symbolism, the way labor is divided by gender, and what counts as masculine and feminine identity and behavior. The second results from the faulty assumption that gender differences in individuals, in human

activities, and in symbolic systems are morally and politically symmetrical. In addition to the use of these two inadequate concepts of gender, there are also conflicting views about what strategies can best be used to eliminate androcentrism from knowledge-seeking. Let us consider these three problems in turn.

Some of the feminist science critics do not even recognize, let alone try to account for, the relationships between symbolic gender, the division of labor by gender, and individual gender. Since I pursue this issue in subsequent chapters, I will describe here just two examples of this kind of undertheorized approach to gender and science. In the first example, the issue is the support two forms of gender provide the third; and in the second, an opposition between two forms of gender motivates expressions of the third.

Equity studies focus on individual gender: on how women are discriminated against within the social structure of the scientific enterprise, and on the barriers the scientific enterprise and feminine gender socialization create for women entering and remaining in science. These studies explain the low representation of women in science courses, laboratories, scientific societies, and scientific publications in terms of these factors; and they criticize the characteristics of feminine identity and behavior encouraged by our culture that work against girls' and women's achievement of the motivation or skills to enter science. The proponents of equity recommend a variety of affirmative action strategies and resocialization practices for female children in order to increase the representation of women in science.

But these critics often fail to see that the division of labor by gender in the larger society and the gender symbolism in which science participates are equally responsible for the small number of women in science and for the fact that girls usually do not want to develop the skills and behaviors considered necessary for success in science. Until both the "emotional labor" and the "intellectual and manual labor" of housework and child care are perceived as desirable human activities for all men, the "intellectual and manual labor" of science and public life will not be perceived as potentially desirable activities for all women. The equity recommendations, moreover, ask women to exchange major aspects of their gender identity for the masculine version—without prescribing a similar "degendering" process for men. Feminists who have worked on these projects have exerted themselves heroically in the face of immense hostility for over a century, and I do not mean to trivialize their truly amazonian efforts. There certainly are good

political reasons why they have not mounted a campaign to get men scientists involved in child care and in transforming their own gender needs and desires. But their efforts have not achieved the results they expected. One reason is that their shallow level of social analysis fails to locate those underlying causes of discrimination against women in science that are to be found in the gendered division of labor in social life and in science's enthusiastic participation in our culture's symbol-making.

In the second example, some of the "textual critiques" of science seem to imply that we could eliminate the androcentrism of science if only we would draw attention to the beliefs and behaviors commonly thought of as feminine but nevertheless characteristic of (men) scientists in history. They suggest that the growth of science has been promoted as much by intuitive thinking, by valuing relational complexes, and by nurturing attitudes toward both nature and new hypotheses as it has by formal logic and mathematics, by mechanistic views, and by the "severe testing" of hypotheses accomplished by "torturing nature." Thus they seem to say that challenging the symbolization of scientific activity as uniquely masculine could eliminate androcentrism from science.

Again, these critiques have proved valuable indeed; they have greatly advanced our understanding of how gender ideologies are used by science. But the recommendation ignores the conscious or unconscious motivations for such gender symbolizing provided by *conflicts* between divisions of labor by gender in the larger society and individual masculine identity needs. Gender totemism in science is often energized by perceived oppositions or conflicts between masculine identity needs and threatened or actual divisions of labor by gender.

The second inadequate conceptualization of gender involves the assumption that masculinity and femininity are simply partial but combinable expressions of human symbol systems, ways of dividing social labor, and individual identities and behaviors. Many feminist critics seem to say that it is possible to strip away the undesirable aspects of masculinity and femininity and thus arrive at attractive cores which, while partial, are morally and politically symmetrical. The problem for feminism, as these thinkers see it, is that science has confused the masculine with the human ideal when the human must also include the feminine. But femininity and masculinity are not so easily combined; central to the notion of masculinity is its rejection of everything that is defined by a culture as feminine and its legitimated control of

whatever counts as the feminine. Masculinity requires the conception of woman as "other," as Simone de Beauvoir pointed out.¹⁸ Femininity is constructed to absorb everything defined as not masculine, and always to acquiesce in domination by the masculine. Thus this conception of gender difference cannot explain how in our culture, as in the vast majority of others, political power and moral value are monopolized by men at the expense of women. Gender is an *asymmetrical* category of human thought, social organization, and individual identity and behavior.

Finally, we can perceive very different assessments of gender in three proposals for the appropriate goal of a feminist critique of science. One approach argues that we should try to replace the masculine voice of science's past and present with a feminine voice. We should reverse the valuation of masculine and feminine interests in and ways of knowledge-seeking, leaving science differently gendered. We should want a science *for* women.¹⁹ The second approach calls for the creation of knowledge-seeking not in the feminine but in the feminist voice.²⁰ This proposal holds that the exaltation of gender—masculine or feminine—is detrimental to a truly inclusive human science. The third approach claims that the goals of the first two are still limited by masculine metaphysical and epistemological frameworks. It urges that we try to eliminate the defensive androcentric urge to imagine a "transcendental ego" with a single voice that judges how close our knowledge claims approach the "one true story" of the way the world is. Instead, we should try to create "reciprocal selves" that are federated in solidarities—rather than united in essentialized and naturalized identities—and correspondingly "decentered" knowledge-seeking.²¹ We should want a form and purpose for knowledge-seeking which, whatever their other advantages, would probably bear little resemblance to what we think of as science. In later chapters we will examine the tensions between these three proposals for the goal of a feminist criticism of science and the reasons why we should want to maintain rather than to eliminate these tensions.

An adequate theorization of gender will always lead us to ask ques-

¹⁸de Beauvoir (1953).

¹⁹This phrase is Dorothy Smith's (1977), though she may not have in mind the proposal described here.

²⁰See, e.g., Hartsock (1983b).

²¹See, e.g., the discussions in *Signs* (1981); Marks and de Courtivron (1981); Flax (1984); Haraway (1985).

tions about the interactions between gender symbolism, the particular way in which social labor or activity is divided by gender, and what constitutes gendered identities and desires in any particular culture. These questions are pertinent to the culture of science in fifteenth- to seventeenth-century Europe as well as to the cultures that have supported science in later centuries. Furthermore, because of the "logical" asymmetry in the content and valuation of masculinity and femininity, it is a situation that requires explanation if we find men scientists carrying on what would appear to them to be characteristically feminine activity or holding the kinds of beliefs their culture identifies as feminine. We must ask questions about the often irrational relationship between the asymmetrical gender symbolism of activities and beliefs and the asymmetrical sexual order and forms of gendered personal identity. And we must critically examine the purposes and goals of the forms of knowledge-seeking envisioned as a result of the feminist revolution. To bring that revolution to the natural sciences requires that we deepen our understanding of the complexity of the relation between the different ways in which science is gendered, as well as that we more thoroughly abandon the dogmas of empiricism.

I have been arguing that scientific, philosophic, and popular understandings of natural science are particularly hostile to a feminist critique. This resistance may appear reasonable if one thinks of gender difference as either a "natural" elaboration of biological difference or as culturally created characteristics attributable only to individuals and their behaviors. And it will appear reasonable if one insists on an excessively empiricist understanding of "what science is."

A series of related dogmas of empiricism ground and provide justification for this hostility, securing an apparent immunity for the scientific enterprise from the kinds of critical and causal scrutiny that science recommends for all the other regularities of nature and social life. If we were to abandon these dogmas of empiricism, we could adopt the alternative view that science is a fully social activity—as social and as culturally specific as are religious, educational, economic, and family activities. We would then find valuable critical interpretive approaches to all the activities that count as scientific, as well as to those that make scientific activity possible: selecting problematics; formulating and evaluating hypotheses; designing and performing experiments; interpreting results; motivating, educating, and recruiting young people for the scientific work force; organizing that work force and the

support services—in families and psychiatrists' offices, as well as in laboratories—that make it possible for some people to be scientists; selecting, funding, and developing the technologies necessary to carry out scientific inquiry and those that inquiry makes possible; assigning different social meanings and values to scientific reason and to moral, political, and emotional reason.

Feminism proposes that there are no contemporary humans who escape gendering; contrary to traditional belief, men do not. It argues that masculinity—far from being the ideal for members of our species—is at least as far from the paradigmatically admirable as it has claimed femininity to be. Feminism also asserts that gender is a fundamental category within which meaning and value are assigned to everything in the world, a way of organizing human social relations. If we regarded science as a totally social activity, we could begin to understand the myriad ways in which it, too, is structured by expressions of gender. All that stands between us and that project are inadequate theories of gender, the dogmas of empiricism, and a good deal of political struggle.

6 FROM FEMINIST EMPIRICISM TO FEMINIST STANDPOINT EPISTEMOLOGIES

The androcentric ideology of contemporary science posits as necessary, and/or as facts, a set of dualisms—culture vs. nature; rational mind vs. prerational body and irrational emotions and values; objectivity vs. subjectivity; public vs. private—and then links men and masculinity to the former and women and femininity to the latter in each dichotomy. Feminist critics have argued that such dichotomizing constitutes an ideology in the strong sense of the term: in contrast to merely value-laden false beliefs that have no social power, these beliefs structure the policies and practices of social institutions, including science.¹

Could there be an alternative mode of knowledge-seeking not structured by this set of dualisms? Many feminists have been hesitant to claim that a specifically feminist science or epistemology is possible—or at least that we can now envision what such a science and epistemology would look like. Historian of science Donna Haraway believes that feminists need to consider such questions as these:

Is there a specifically feminist theory of knowledge growing today which is analogous in its implications to theories which are the heritage of Greek science and of the scientific revolution of the seventeenth century? Would a feminist epistemology informing scientific inquiry be a family member

¹See the papers in MacCormack and Strathern (1980), which argue that these particular dualisms are Western and modern. For criticisms, see Fee (1981); Griffin (1978); Hubbard, Henifin, and Fried (1982); Jordanova (1980); Keller (1984); Harding and Hintikka (1983); Merchant (1980); Rose (1983); Stehelin (1979).

From Empiricism to Standpoint Epistemologies

to existing theories of representation and philosophical realism? Or should feminists adopt a radical form of epistemology that denies the possibility of access to a real world and an objective standpoint? Would feminist standards of knowledge genuinely end the dilemma of the cleavage between subject and object or between noninvasive knowing and prediction and control? Does feminism offer insight into the connections between science and humanism? Do feminists have anything new to say about the vexed relations of knowledge and power? Would feminist authority and power to name give the world a new identity, a new story?²

AMBIVALENCE AND TRANSITION

Haraway is skeptical that feminist theory (at least in its 1981 form, when she formulated these challenges) can provide the answers. Her questions were prompted by an ambivalence within feminist thinking about science that is still problematic. One form this ambivalence takes is the appeal to Kuhnian arguments: men see the world in one way, women in another; on what possible grounds other than gender loyalties can we decide between these conflicting accounts? For example, to some observers this appears to be the state of the “man-the-hunter” vs. “woman-the-gatherer” hypotheses we examined in Chapter 4.³ But feminists who deny the possibility of access to a real world and an objective standpoint appear to cut off the possibility of a degendered science at all. Of course, such relativist accounts are responding to the well-founded belief that philosophical and scientific appeals to objectivity and value-free inquiry have often merely provided covers for the refusal to scrutinize critically the social values and projects that have played an important role in the history of science and its intellectual structures. But does our recognition of the fact that science has always been a social product—that its projects and claims to knowledge bear the fingerprints of its human producers—require the exaltation of relativist subjectivity on the part of feminism?

Haraway is certainly right to question whether the feminist critique of “objectivism” (the assumption that objectivity must always be satisfied by value-neutrality) forces us to “subjectivism,” to relativism (the assumption that no value-directed inquiries can be objective and therefore all are equally justifiable). Does not this subjectivism leave un-

²Haraway (1981, 470).

³Longino and Doell (1983). But see Caulfield (1985) and Zihlman (1985) for different assessments of the epistemological and political status of feminist contributions to evolutionary theory.

challenged far too much of the opposition between facts and values, "pure science" and moral/political society, claimed by the science we have? After all, the science we have is highly incorporated into the projects of a bourgeois, racist, and masculine-dominant state, military, and industrial complex. Is "different strokes for different folks" the most defensible and powerful response that can be made to the life-threatening projects supported by the science we have?

The leap to relativism also misgrasps feminist projects. The leading feminist theorists do not try to substitute one set of gender loyalties for the other—"woman-centered" for "man-centered" hypotheses. They try instead, to arrive at hypotheses that are free of gender loyalties. It is true that first we often have to formulate a "woman-centered" hypothesis in order even to comprehend a gender-free one. But the goal of feminist knowledge-seeking is to achieve theories that accurately represent women's activities as fully social, and social relations between the genders as a real—an explanatorily important—component in human history. There is nothing "subjective" about such a project, unless one thinks only visions distorted by gendered desires could imagine women to be fully social and gender relations to be real explanatory variables. From the perspective of feminist theory and research, it is *traditional* thought that is subjective in its distortion by androcentrism—a claim that feminists are willing to defend on traditional objectivist grounds.

The ambivalence also appears when feminists appeal to scientific "facts" to refute sexist claims to provide scientific "facts," while simultaneously denying possibility of perceiving any reality "out there" apart from socially constructed languages and belief systems. Haraway points out that this ambivalent stance is often taken by the same feminist scientists who have provided the most powerful criticisms of "objectivism." How can we appeal to our own scientific research in support of alternative explanations of the natural and social world that are "less false" or "closer to the truth," and at the same time question the grounds for taking scientific facts and their explanations to be the reasonable end of justificatory arguments? As Longino and Doell phrased the issue, how can we simultaneously question both "bad science" and "science-as-usual"?

Another problem that may have motivated Haraway's questions is raised by Elizabeth Fee. Should we look for an alternative science in laboratory procedures, in the methods and modes of reasoning that feminist scientists use? As some hostile skeptics are wont to ask: "Does

feminism have an alternative to deduction and induction? To observation and experiment? If not, what could be meant by a feminist science?" We considered in Chapter 2 the distorted conception of science motivating these kinds of questions. Arguing that "at this historical moment, what we are developing is not a feminist science, but a feminist critique of existing science," Fee proposes that we must first bring about a feminist society before we can even begin to imagine a feminist science. "We can expect a sexist society to develop a sexist science; equally we can expect a feminist society to develop a feminist science. For us to imagine a feminist science in a feminist society is rather like asking a medieval peasant to imagine the theory of genetics or the production of a space capsule; our images are, at best, likely to be sketchy and unsubstantial."⁴ Fee is certainly right to stress the importance of feminist practice to feminist theory, and the consequent limitations on our ability to imagine the intellectual structures of a world we do not yet have. But must a feminist program for new understanding of knowledge-seeking remain on the back burner until we achieve a feminist society? Does theory come entirely after practice? Or does it emerge as an ongoing process from the struggles in which we engage to bring about a feminist society? And will the fundamental novelties of a feminist science be found in its substantive theories and technologies, or in its epistemology—its theory of the possible and desirable relationships between "human nature" and the world we would understand—or, perhaps, in the fit between the two? (How would we answer these questions about modern science itself?)

Some theorists have argued that forerunners or hints of a feminist science can be detected in the alternative practices of present women scientists.⁵ It is becoming perfectly clear that many women conceptualize interactions with other people and nature differently than do most Western men, as the feminist object-relations studies reviewed in Chapter 5 indicated. But I think it is a mistake to search through existing or past practices of individual women scientists for the broad outlines of a feminist science. That would be like looking for a vision of the scientific world view in the imaginations not perhaps of Fee's medieval peasants but rather of early Renaissance artisans and the like, whose new kind of labor made possible the ensuing widespread appreciation of the virtues of experimental observation.⁶

⁴Fee (1981, 22).

⁵E.g., Merchant (1980, ch. 11); Keller (1983); Rose (1983).

⁶See Zilsel (1942), and my discussion in Chapter 9.

Women scientists do violate the division of labor by gender which restricts women to domestic work or low-status wage labor. But how alternative can the practices be of isolated individuals who have somehow managed to bridge this division of labor and social identity? The research agendas of the natural sciences are set in international circles—not by isolated researchers in local laboratories. The existing social structure of science (reviewed in Chapter 3) is an obstacle to the expression within science of whatever unique talents and abilities individual women scientists may have. Furthermore, is a feminist science simply the collection of women scientists' alternative concepts and practices, isolated from any direction by the shifting and diverse understandings and goals of feminist theory and the women's movement? Can a science grounded in women's *identities as gendered* be a sound grounding for a *feminist science*?

To locate the possible directions within which a feminist science could emerge, we should look instead to the distinctive theories of knowledge already being developed. What we think of today as "scientific method" took centuries to develop. Only the broadest generalities about procedures of inquiry and their justificatory strategies can link Galileo's "method" with the methods used today by high-energy physicists or by geneticists. (And as we saw in Chapter 2, much of what we think of as scientific method does not in fact distinguish scientific activities from others we do not call scientific—an issue that has preoccupied much of the philosophical post-Kuhnian discourse.) But some of the proposals about knowers, the world to be known, and the process of coming to know that distinguish modern from medieval theories of knowledge were already clearly detectable in the thinking of Galileo and his peers. Similarly, feminist theoreticians have already proposed concepts of knowers, the world to be known, and the process of knowing that distinguish feminist theories of knowledge from the dominant Western views of the last few centuries. It is these alternative feminist theories of knowledge that already implicitly or explicitly direct many feminist inquiry practices.

The questions we recognize as epistemological originated in their modern form as a "meditation" upon the implications of the emergence of modern science itself. Descartes, Locke, Hume, and Kant were trying to make sense of the kind of knowledge-seeking exemplified by Copernicus, Galileo, and Newton. The creators of modern epistemologies were meditating upon what they understood to be a science created by individual "craft-laborers." Their percep-

tions of the nature and activities of what they took to be the individual, "disembodied," but human mind, beholden to no social commitments but the willful search for clear and certain truth, remain the foundations from which the questions we recognize as epistemological arise. Once we stop thinking of modern Western epistemologies as a set of philosophical givens, we can begin to examine them instead as historical justificatory strategies—as culturally specific modes of constructing and exploiting cultural meanings in support of new kinds of knowledge claims. After all, the legitimacy of the theological justifications once presented for scientific (and mathematical) claims and practices was eventually undercut by the claims and practices of modern science; the scientific claims and practices became more intuitively acceptable than the theologies invoked to justify them.

Similarly, I shall argue that the substance of feminist claims and practices can be used to undercut the legitimacy of the modernist epistemologies, which explicitly ignore gender while implicitly exploiting distinctively masculine meanings of knowledge-seeking. Gender-sensitive revisions of modernist epistemologies have provided the main justificatory resources for feminism—a situation only now coming to be fully recognized by feminist theorists, though forerunners of such recognition can be seen in the ambivalences we have noted. Thus I propose that we think of feminist epistemologies as still transitional meditations upon the substance of feminist claims and practices. In short, we should expect, and perhaps even cherish, such ambivalences and contradictions. In this sense, Fee is right: we will have a feminist science fully coherent with its epistemological strategies only when we have a feminist society.

In this chapter and the next I want to examine the feminist standpoint epistemologies we previewed in Chapter 1, identify some challenges to these epistemologies, and explore the motivation toward feminist postmodernism that such challenges create.

THE FEMINIST STANDPOINT EPISTEMOLOGIES

The feminist standpoint epistemologies ground a distinctive feminist science in a theory of gendered activity and social experience. They simultaneously privilege women or feminists (the accounts vary) epistemically and yet also claim to overcome the dichotomizing that is characteristic of the Enlightenment/bourgeois world view and its sci-

ence.⁷ It is useful to think of the standpoint epistemologies, like the appeals to feminist empiricism, as “successor science” projects: in significant ways, they aim to reconstruct the original goals of modern science. In contrast, feminist postmodernism more directly challenges those goals (though there are postmodernist strains even in these standpoint writings).

An observer of these arguments can pick out five different though related reasons that they offer to explain why inquiry from a feminist perspective can provide understandings of nature and social life that are not possible from the perspective of men’s distinctive activity and experience. I shall identify each of these reasons in the writing of one theorist who has emphasized this particular aspect of the gendered division of activity, though most of these theorists recognize more than one. Whatever their differences, I think the accounts should be understood as fundamentally complementary, not competing.

The Unity of Hand, Brain and Heart in Craft Labor.

Hilary Rose’s “feminist epistemology for the natural sciences” is grounded in a post-Marxist analysis of the effects of gendered divisions of activity upon intellectual structures.⁸ In two recent papers, she has developed the argument that it is in the thinking and practices of women scientists whose inquiry modes are still characteristically “craft labor,” rather than the “industrialized labor” within which most scientific inquiry is done, that we can detect the outlines of a distinctively feminist theory of knowledge. Its distinctiveness is to be found in the way its concepts of the knower, the world to be known, and processes of coming to know reflect the unification of manual, mental, and emotional (“hand, brain, and heart”) activity characteristic of women’s work more generally. This epistemology not only stands in opposition to the Cartesian dualisms—intellect vs. body, and both vs. feeling and emotion—that underlie Enlightenment and even Marxist visions of science but also grounds the possibility of a “more complete materialism, a truer knowledge” than that provided by either paternal discourse (1984, 49). The need for such a feminist science “is increasingly acute,” for “bringing caring labor and the knowledge that stems from

⁷The offensively dichotomized categories of labor vs. leisure, which appear in the parental Enlightenment/bourgeois and Marxist theories, are themselves the target of criticism in the standpoint epistemologies; it is a theory of human *activity* and social experience they are proposing.

⁸Rose (1983; 1984). Subsequent page references to these papers appear in the text.

participation in it to the analysis becomes critical for a transformative program equally within science and within society” if we are to avoid the nuclear annihilation and deepening social misery increasingly possible otherwise (1983, 89).

Rose starts by analyzing the insights of post-Marxist thinking upon which feminists can build. Sohn-Rethel saw that it was the separation of manual from mental labor in capitalist production that resulted in the mystifying abstractions of bourgeois science.⁹ But social relations include far more than the mere production of commodities where mental and manual labor are assigned to different classes of people. Like Marx, Sohn-Rethel failed to ask about the effect on science of assigning *caring* labor exclusively to women.¹⁰ Rose argues that in this respect, post-Marxists such as Sohn-Rethel are indistinguishable from the sociobiological theorists to whom they are vehemently opposed; they tacitly endorse the “far-from-emancipatory program of sociobiology, which argues that woman’s destiny is in her genes.” Feminists must explain the relationship between women’s unpaid and paid labor to show that women’s caring skills have a social genesis, not a natural one, and that they “are extracted from them by men primarily within the home but also in the work place” (1983, 83–84).

Rose goes on to analyze the relationship of the conditions of women’s activities within science with those in domestic life, and the possibilities created by these kinds of activities for women to occupy an advantaged standpoint as producers of less distorted and more comprehensive scientific claims. A feminist epistemology cannot originate in meditations upon what women do in laboratories, since the women there are forced to deny that they are women in order to survive, yet are still “by and large shut out of the production system of scientific knowledge, with its ideological power to define what is and what is not objective knowledge” (1983, 88). They are prohibited from becoming (masculine) scientific knowers and also from admitting to being what they are primarily perceived as being: women.¹¹

In her earlier paper, Rose argues that a feminist epistemology must be grounded in the practices of the women’s movement. In its consideration of such biological and medical issues as menstruation, abortion, and self-examination and self-health care, the women’s movement fuses “subjective and objective knowledge in such a way as to make new

⁹Sohn-Rethel (1978).

¹⁰Hartsock (1983b; 1984) also raises this criticism about Sohn-Rethel.

¹¹Cf. the discussion of this dilemma in Stehelin (1979).

knowledge.” “Cartesian dualism, biological determinism, and social constructionism fade when faced with the necessity of integrating and interpreting the personal experience of [menstrual] bleeding, pain, and tension,” Rose declares. “Working from the experience of the specific oppression of women fuses the personal, the social, and the biological.” Thus a feminist epistemology for the natural sciences will emerge from the interplay between “new organizational forms” and new projects (1983, 88–89). The organizational forms of the women’s movement, unlike those of capitalist production relations and its science, resist dividing mental, manual, and caring activity among different classes of persons. And its project is to provide the knowledge women need to understand and manage our own bodies: subject and object of inquiry are one. Belief emerging from this unified activity in the service of self-knowledge is more adequate than that emerging from activity that is divided and that is performed for the purposes of monopolizing profit and social control.

This first paper left a gap between the kind of knowledge/power relations possible in a science grounded in women’s understandings of our own bodies and the kind needed if a feminist science is to develop sufficient muscle to replace the physics, chemistry, biology, and social sciences we have. In the later paper, Rose inches across this gap by expanding the domain in which she thinks we can identify the origins of a distinctive feminist epistemology. The origins of an epistemology which holds that appeals to the subjective are legitimate, that intellectual and emotional domains must be united, that the domination of reductionism and linearity must be replaced by the harmony of holism and complexity, can be detected in what Foucault would call “subjugated knowledges”—submerged understandings within the history of science (1984, 49).

Rose has in mind here the ecological concerns reported and elaborated by Carolyn Merchant and evident in Rachel Carson’s work, and the calls for moving beyond reductionism toward a holistic “feminization of science” evident in writers such as David Bohm and Fritjof Capra.¹² She might also have cited here Joseph Needham’s romantic idealization of Chinese science as more feminized than Western sci-

¹²Merchant (1980); Rachel Carson, *Silent Spring* (New York: Fawcett, 1978, originally published in 1962); David Bohm, *Wholeness and the Implicate Order* (Boston: Routledge & Kegan Paul, 1980); Fritjof Capra, *The Tao of Physics* (New York: Random House, 1975).

ence.¹³ And then we would have to think about the contradictions between China’s history of a “feminized science” and the far from emancipatory history of Chinese misogyny. This raises the troublesome issue of the conflation of gender dichotomies as a metaphor for other dichotomies (gender symbolism) with explanations that treat social relations between the sexes as a causal influence on history—a point to be pursued later. Furthermore, this line of thought leads directly toward feminist distrust of men’s conceptions of the androgyny men desire for themselves. When men want androgyny, they usually intend to appropriate selectively parts of “the feminine” for their projects, while leaving the lot of real women unchanged.¹⁴

Within recent scientific research by women in biology, psychology, and anthropology—areas where “craft” forms of scientific inquiry are still possible, in contrast to the “industrial” forms confronting women in masculine-dominated labs—Rose detects the most significant advances toward “a more complete materialism, a truer knowledge.” In all of these areas, feminist thinking has produced a new comprehension of the relationships between organisms, and between organisms and their environment. The organism is conceptualized “not in terms of the Darwinian metaphor, as the passive object of selection by an indifferent environment, but as [an] active participant, a subject in the determination of its own future” (1984, 51). (Keller has argued that Barbara McClintock’s work provides a paradigm of this kind of alternative to the “master theory” of Darwinian biology.¹⁵)

Thus Rose proposes that the grounds for a distinctive feminist science and epistemology are to be found in the social practices and conceptual schemes of feminists (or women inquirers) in craft-organized areas of inquiry. There women’s socially created conceptions of nature and social relations can produce new understandings that carry emancipatory possibilities for the species. These conceptions are not necessarily original to women scientists: hints of them can be detected in the “subjugated knowledges” in the history of science. However, we can here hazard an observation Rose does not make: where these notions neither originate in nor give expression to any distinctive social/

¹³Needham (1976).

¹⁴See Bloch and Bloch (1980) on the deradicalization of the thought of Rousseau and other French thinkers that occurred once they recognized that the logic of their radical arguments was about to lead them directly to the conclusion that “the good” which should direct the social order was identical to what, in fact, women do.

¹⁵Keller (1983).

political experience, they are fated to remain mere intellectual curiosities—like the ancient Greek ideas about atoms—awaiting their “social birth” within the scientific enterprise at the hands of a group which needs such conceptions in order to project onto nature its destiny within the social order. One cannot help noticing that the notion of organisms as active participants in the determination of their own futures “discovers” in “nature” the very relationship that feminist theory claims has been permitted only to (dominant group) men but *should* exist as well for women, who are also history-making social beings. Men have actively advanced their own futures within masculine domination; women, too, could actively participate in the design of their futures within a degendered social order.

Whether or not Rose would agree to this conclusion, she does argue that the origins of a feminist epistemology for a successor science are to be found in the conceptions of the knower, the processes of knowing, and the world to be known which are evident in this substantive scientific research. The substantive claims of this research are thus to be justified in terms of women’s different activities and social experiences created in the gendered division of labor/activity. As I shall ask of each of these standpoint theorists, does this epistemology still retain too much of the Enlightenment vision?

Women’s Subjugated Activity: Sensuous, Concrete, Relational.

Like Rose, political theorist Nancy Hartsock locates the epistemological foundations for a feminist successor science in a post-Marxist theory of labor (activity) and its effects upon mental life. For Hartsock, too, Sohn-Rethel provides important clues. But Hartsock begins with Marx’s metatheory, his “proposal that a correct vision of class society is available from only one of the two major class positions in capitalist society.”¹⁶ By starting from the lived realities of women’s lives, we can identify the grounding for a theory of knowledge that should be the successor to both Enlightenment and Marxist epistemologies. For Hartsock as for Rose, it is in the gendered division of labor that one can discover both the reason for the greater adequacy of feminist knowledge claims, and the root from which a full-fledged successor to Enlightenment science can grow. However, the feminist successor science will be anti-Cartesian, for it transcends and thus stands in opposition

¹⁶Hartsock (1983b, 284). This paper also appears as ch. 10 in Hartsock (1984). Page numbers in the text refer to the 1983 version.

to the dichotomies of thought and practice created by divisions between mental and manual labor, though in a way different from that which Rose identifies.

Women’s activity consists in “sensuous human activity, practice.” Women’s activity is institutionalized in two kinds of contributions—to “subsistence” and to child-rearing. In subsistence activities, contributions to producing the food, clothing, and shelter necessary for the survival of the species,

the activity of a woman in the home as well as the work she does for wages keeps her continually in contact with a world of qualities and change. Her immersion in the world of use—in concrete, many-qualified, changing material processes—is more complete than [a man’s]. And if life itself consists of sensuous activity, the vantage point available to women on the basis of the contribution to subsistence represents an intensification and deepening of the materialist world view and consciousness available to the producers of commodities in capitalism, an intensification of class consciousness. [p. 292]

However, it is in examining the conditions of women’s activities in child care that the inadequacy of the Marxist analysis appears most clearly. “Women also produce/reproduce men (and other women) on both a daily and a long-term basis. This aspect of women’s ‘production’ exposes the deep inadequacies of the concept of production as a description of women’s activity. One does not (cannot) produce another human being in anything like the way one produces an object such as a chair. . . . Helping another to develop, the gradual relinquishing of control, the experience of the human limits of one’s action” are fundamental characteristics of the child care assigned exclusively to women. “The female experience in reproduction represents a unity with nature which goes beyond the proletarian experience of interchange with nature” (p. 293).

Furthermore, Hartsock draws on the feminist object-relations theory of Jane Flax and Nancy Chodorow to show that women are “made, not born” in such a way as to define and experience themselves concretely and relationally.¹⁷ In contrast, newborn males are turned into men who define and experience themselves abstractly and as fundamentally isolated from other people and nature. Not-yet-gendered newborn males and females are shaped into the kinds of personalities

¹⁷Flax (1983); Chodorow (1978).

who will want to perform characteristic masculine and feminine activities. The consequences that object-relations theorists describe are just what Hartsock finds when she examines the adult division of labor by gender: relational femininity vs. abstract masculinity. Both the epistemology and the society constructed by "men suffering from the effects of abstract masculinity" emphasize "the separation and opposition of social and natural worlds, of abstract and concrete, of permanence and change"—the same oppositions as those stressed in the Marxist analysis of bourgeois labor. Thus the true counter to the bourgeois subjugations and mystifications is not to be found in a science grounded in proletarian experience, for this is fundamentally still a form of men's experience; it is instead to be found in a science grounded in women's experience, for only there can these separations and oppositions find no home (pp. 294–98).

The conditions under which women contribute to social life must be generalized for all humans if an effective opposition to androcentric and bourgeois political life and science/epistemology is to be created. Politically, this will lead to a society no longer structured by masculinist oppositions in either their bourgeois or proletarian forms; epistemologically, it will lead to a science that will both direct and be directed by the political struggle for that society.

A feminist epistemological standpoint is an interested social location ("interested" in the sense of "engaged," not "biased"), the conditions for which bestow upon its occupants scientific and epistemic advantage. The subjugation of women's sensuous, concrete, relational activity permits women to grasp aspects of nature and social life that are not accessible to inquiries grounded in men's characteristic activities. The vision based on men's activities is both partial and perverse—"perverse" because it systematically reverses the proper order of things: it substitutes abstract for concrete reality; for example, it makes death-risking rather than the reproduction of our species form of life the paradigmatically human act. Even early feminists such as Simone de Beauvoir think within abstract masculinity: "It is not in giving life but in risking life that man is raised above the animal: that is why superiority has been accorded in humanity not to the sex that brings forth but to that which kills."¹⁸

Moreover, men's vision is not simply false, for the ruling group can make their false vision become apparently true: "Men's power to struc-

¹⁸Simone de Beauvoir (1953, 58), cited in Hartsock (1983, 301).

ture social relations in their own image means that women, too, must participate in social relations which manifest and express abstract masculinity" (p. 302). The array of legal and social restrictions on women's participation in public life makes women's characteristic activities appear to both men and women as merely natural, as merely continuous with the activities of female termites or apes (as the sociobiologists would have it), and thus as suitable objects of men's manipulations of whatever they perceive as purely natural. The restriction of formal and informal educational opportunities for women makes women appear incapable of understanding the world within which men move, and as appropriately forced to deal with that world in men's terms.

The vision available to women "must be struggled for and represents an achievement which requires both science to see beneath the surface of the social relations in which all are forced to participate, and the education which can only grow from struggle to change those relations" (p. 285). The adoption of this standpoint is fundamentally a moral and political act of commitment to understanding the world from the perspective of the socially subjugated. It constitutes not a switch of epistemological and political commitments from one gender to the other but a commitment to the transcendence of gender through its elimination. Such a commitment is social and political, not merely intellectual.

Hartsock is arguing that divisions of labor more intensive than those Marx identified create dominating political power and ally perverse knowledge claims with the perversity of dominating power. Therefore, a science generated out of a transcendence, a transformation, of these divisions and their corresponding dualisms will be a powerful force for the elimination of power. In an earlier paper, Hartsock argued that the concept of power central to the history of political theory is only one available concept. Against power as domination *over* others, feminist thinking and organizational practices express the possibility of power as the provision of energy *to* others as well as self, and of reciprocal empowerment.¹⁹ I think this second notion of power and the kind of knowledge that could be allied with it can remove the apparent paradox from her adoption of both successor science and postmodern tendencies. One can insist on an epistemology-centered philosophy only if the "policing of thought" that epistemology entails is a reciprocal project—with the goal of eliminating the kind of dom-

¹⁹Hartsock (1974).

inating power that makes the policing of thought necessary.²⁰ That is, such an epistemology would be a transitional project, as we transform ourselves into a culture uncomfortable with domination and thereby into peoples whose thought does not need policing.

Hartsock's grounds for a feminist epistemology are both broader and narrower than Rose's. They are narrower in that it is feminist political struggle and theory ("science")—not simply characteristic women's activities—in which the tendencies toward a specifically feminist epistemology can be detected. Unmediated by feminist struggle and analysis, women's distinctive practices and thinking remain part of the world created by masculine-domination.²¹ But her grounds are also broader, for any feminist inquiry that starts from the categories and valuations of women's subsistence and domestic labor and is *interested* (again in the sense of *engaged*) in the struggle for feminist goals provides the grounding for a distinctive epistemology of a successor to Enlightenment science. The women's health movement and the alternative understandings of the relationship between organism and environment that Rose points to would provide significant examples of such inquiries (insofar as they are motivated by the goals of feminist emancipation). But so would any of the natural or social science inquiries that begin by taking women's activities as fully social and try to explain nature and social life for feminist political purposes. There is still a significant gap in Hartsock's account between feminist activity and a science/epistemology robust and politically powerful enough to unseat the Enlightenment vision. But in both its broader and narrower aspects, Hartsock's account inches yet further across the gap by extending the foundation for the successor science to the full array of feminist political and scientific projects and, at least implicitly, to activities in which men as well as women feminists engage.

There is another important difference in the groundings these two theorists identify for the successor epistemology. Hartsock does not directly focus on the "caring" labor of women, which Rose takes to be the distinctive human activity missing in the Marxist accounts. For Hartsock, the uniqueness of women's labor, in contrast to proletarian labor, is to be found in its more fundamental opposition to the mental/manual dualities that structure masculine/bourgeois thought

²⁰This critique of epistemology-centered philosophy and its policing of thought is central to the postmodernists. See, e.g., Rorty (1979) and Foucault (1980).

²¹Rose would probably agree with this; many of her other writings would support such an argument. See, e.g., the papers in Rose and Rose (1976).

and activity. For Hartsock, (men's) proletarian labor is transitional between bourgeois/masculine and women's labor, since women's labor is more fundamentally involved with the self-conscious, sensuous processing of our natural/social surroundings in daily life—is the distinctively human activity. For Rose, women's labor is different in kind from (masculine) proletarian/bourgeois labor.

The "Return of the Repressed" in Feminist Theory.

Jane Flax, a political theorist and psychotherapist, explicitly describes the successor science and postmodern tendencies in feminist epistemology as conflicting. In the later of two papers I shall examine, she argues for the postmodern direction to replace the successor science tendency, yet in both papers the two tendencies are linked in a way that evidently appears noncontradictory to her.

In a paper written in 1980, though not published until 1983, Flax calls for a "successor science" project:

The task of feminist epistemology is to uncover how patriarchy has permeated both our concept of knowledge and the concrete content of bodies of knowledge, even that claiming to be emancipatory. Without adequate knowledge of the world and our history within it (and this includes knowing how to know), we cannot develop a more adequate social practice. A feminist epistemology is thus both an aspect of feminist theory and a preparation for and a central element of a more adequate theory of human nature and politics.²²

"Feminist philosophy thus represents the return of the repressed, of the exposure of the particular social roots of all apparently abstract and universal knowledge. This work could prepare the ground for a more adequate social theory in which philosophy and empirical knowledge are reunited and mutually enriched" (p. 249).

Flax argues that feminist philosophy should ask the question, "What forms of social relations exist such that certain questions and ways of answering them become constitutive of philosophy?" (p. 248). Here a feminist reading of psychoanalytic object-relations theory (see Chapter 5) becomes a useful philosophic tool; it directs our attention to the distinctively gendered senses of self, others, nature, and relations among the three that are characteristic in cultures where infant care is primarily the responsibility of women. For Flax, what is particularly

²²Flax (1983, 269). Subsequent page references appear in the text.

interesting is the fit between masculine senses of self, others, and nature and the definition of what is problematic in philosophy. From this perspective, "apparently insoluble dilemmas within philosophy are not the product of the immanent structure of the human mind and/or nature but rather reflect distorted or frozen social relations" (p. 248). For men more than for women, the self remains frozen in a defensive infantile need to dominate and/or repress others in order to retain its individual identity. In cultures where primary child care is assigned exclusively to women, male infants will develop unresolvable dilemmas concerning the separation of the infantile self from its first "other" and the establishment of individual identity. These are the very same distinctively masculine dilemmas that preoccupy Western philosophers in whose work they appear as "the human dilemma."

Western philosophy problematizes the relationships between subject and object, mind and body, inner and outer, reason and sense; but these relationships would not need to be problematic for anyone were the core self not always defined exclusively against women.

In philosophy, being (ontology) has been divorced from knowing (epistemology) and both have been separated from either ethics or politics. These divisions were blessed by Kant and transformed by him into a fundamental principle derived from the structure of mind itself. A consequence of this principle has been the enshrining within mainstream Anglo-American philosophy of a rigid distinction between fact and value which has had the effect of consigning the philosopher to silence on issues of utmost importance to human life. [p. 248]

Were women not exclusively the humans against whom infant males develop their senses of a separate and individuated self, "human knowledge" would not be so preoccupied with infantile separation and individuation dilemmas. "Analysis reveals an arrested stage of human development . . . behind most forms of knowledge and reason. Separation-individuation [of infants from their caretakers] cannot be completed and true reciprocity emerge if the 'other' must be dominated and/or repressed rather than incorporated into the self while simultaneously acknowledging difference" (p. 269). Human knowledge can come to reflect the more adult issues of maximizing reciprocity and appreciating difference only if the first "other" is "incorporated into the self" rather than dominated and/or repressed.

Flax's point is *not* that the Great Men in the history of philosophy

would have better spent their time on psychoanalytic couches (had they been available) than in writing philosophy. Nor is it that philosophy is nothing but masculine rationalization of painful infantile experience. Rather, she argues that a feminist exposure of the "normal" relations between infantile gendering processes and adult masculine thought patterns "reveals fundamental limitations in the ability of [men's] philosophy to comprehend women's and children's experiences"; in particular, it reveals the tendency of philosophers to take their own experience as paradigmatically human rather than merely as typically masculine (p. 247). We can move toward a feminist epistemology through exposing the infantile social dilemmas repressed by adult men, the "resolutions" of which reappear in abstract and universalizing form as both the collective motive for and the subject matter of patriarchal epistemology. The feminine dimensions of experience tend to disappear in all thinking within patriarchies. But women's experience cannot, in itself, provide a sufficient ground for theory, for "as the other pole of the dualities it must be incorporated and transcended." Thus an adequate feminist philosophy requires "a revolutionary theory and practice. . . . Nothing less than a new stage of human development is required in which reciprocity can emerge for the first time as the basis of social relations" (p. 270).

In this earlier paper, Flax is arguing that infantile dilemmas are more appropriately resolved, less problematic, for women than for men. This small gap between the genders prefigures a larger gap between the defensive gendered selves produced in patriarchal modes of child rearing and the reciprocal, degendered selves that *could* exist were men as well as women primary caretakers of infants, and women as well as men responsible for public life. The forms and processes of knowing as well as what is known will be different for reciprocal selves than for defensive selves. Truly human knowledge and ways of knowing toward which a feminist epistemology points the way, will be less distorted and more nearly adequate than the knowledge and ways of knowing we now have. And while the concepts of reciprocal knowing must be relational and contextual, and thus will no longer enshrine the dualities of Enlightenment epistemology, it is indeed a successor epistemology toward which feminism moves us all.²³

²³Although she stresses here women's less defensive "resolution" of infantile separation and individuation dilemmas, see Flax (1978) for a discussion of those unfortunate residues of the feminine infantile dilemma that create tensions within women and for feminist organizations.

Flax's argument in a paper written four years later contrasts sharply with the foregoing argument. Whereas the earlier paper claims that child-rearing practices leave distinctive marks on philosophers as culturally diverse as Plato, Locke, Hobbes, Kant, Rousseau, and contemporary Anglo-American thinkers, the later one is skeptical that there can be a *single* way that patriarchy has permeated thinking. She finds problematic the notion of "a feminist standpoint which is more true than previous (male) ones." She says, "Any feminist standpoint will necessarily be partial. Each person who tries to think from the standpoint of women may illuminate some aspects of the social totality which have been previously suppressed with the dominant view. But none of us can speak for 'woman' because no such person exists except within a specific set of (already gendered) relations—to 'man' and to many concrete and different women."

Here it is feminist theory's affinities with postmodern philosophy that Flax finds most distinctive:

As a type of post modern philosophy, feminist theory shares with other such modes of thought an uncertainty about the appropriate grounding and methods for explaining and/or interpreting human experience. Contemporary feminists join other post modern philosophers in raising important metatheoretical questions concerning the possible nature and status of theorizing itself. . . . Consensus rules on categorization, appraisal, validity, etc. are lacking.²⁴

This affinity is more fundamental, she argues, than feminist attempts at successor science projects: "Despite an understandable attraction to the (apparently) logical, orderly world of the Enlightenment, feminist theory more properly belongs in the terrain of post modern philosophy." And yet the substance of this later paper argues for a particular way of understanding gender that Flax thinks should replace the inadequate and confusing ways it is conceptualized in both traditional and feminist social theory. Gender should be understood as relational; gender relations are not determined by nature but are social relations of domination, and feminist theorists "need to recover and write the histories of women and our activities into the accounts and self-understanding of the whole" of social relations.

On the one hand, in effect Flax has located the feminist successor science tendencies as part of the projects of the defensive self which

²⁴Flax (1986, 37).

are most evident in men. She identifies postmodern skepticism about the Enlightenment dualities, which ensure the epistemological "policing of thought," as the entering wedge into projects for the reciprocal self. Overcoming the (distinctively masculine) Enlightenment dualities will be possible for our whole culture only after a "revolution in human development." On the other hand, does not Flax's own account of the distorted and frozen social relations characteristic of masculine-dominant societies suggest both that there is "objective basis for distinguishing between true and false beliefs" and that she is herself committed to this kind of epistemology? Even though any particular historical understanding available to feminists ("a feminist standpoint") is partial, may it not also be "more true than previous (male) ones"?

The Bifurcated Consciousness of Alienated Women Inquirers.

Canadian sociologist of knowledge Dorothy Smith has explored in a series of papers what it would mean to construct a sociology that begins from the "standpoint of women." Though her stated concern is sociology, her arguments are generalizable to inquiry in all the social and natural sciences. In the most recent of these papers, she directly articulates the problem of how to fashion a successor science that will transcend the damaging subject-object, inner-outer, reason-emotion dualities of Enlightenment science. "Here, I am concerned with the problem of methods of thinking which will realize the project of a sociology for women; that is, a sociology which does not transform those it studies into objects but preserves in its analytic procedures the presence of the subject as actor and experiencer. Subject then is that knower whose grasp of the world may be enlarged by the work of the sociologist."²⁵ Smith thinks that the forms of alienation experienced by women inquirers make it possible to carry out what I have been calling successor science and postmodern projects simultaneously and without contradiction.

Like the other theorists, Smith's epistemology is grounded in a successor to the Marxist theory of labor. (It is perhaps inaccurate to conjoin Flax with the others in this respect, unless we focus on her discussion of the process through which the infant becomes a social person as the first human labor, which is divided, of course, by the gender of the "laboring" infant.) Smith eschews questions of the developmental origins of gender; of the origins in men's infantile experiences of the defensive

²⁵Smith (1981, 1). See the discussion of Smith's work in Westcott (1979).

abstractions of Western social theory, science, and epistemology; and thus of the reasons why men and women *want* to participate in characteristically masculine and feminine activity. That is, she does not discuss the issue of how initially androgynous infantile "animals" of our species interact with their social/physical environments to become the gendered humans we see around us. Like Rose, she turns to the structure of the workplace for women scientists (sociologists) to locate an enriched notion of the material conditions that make possible a distinctively feminist science.

Where Rose focuses on the unity of hand, brain, and heart common to women's characteristic activities, Smith looks at three other shared aspects of women's work. In the first place, it relieves men of the need to take care of their bodies or of the local places where they exist, freeing them to immerse themselves in the world of abstract concepts. Second, the labor of women thereby "articulates," shapes, men's concepts into those of administrative forms of ruling. The more successfully women perform this concrete work (Hartsock's "world of sensuousness, of qualities and change"), the more invisible does their work become to men. Men who are relieved of the need to maintain their own bodies and the local places where they exist can now see as real only what corresponds to their abstracted mental world. Like Hegel's master, to whom the slave's labor appears merely as an extension of his own being and will, men see women's work not as real activity—self-chosen and consciously willed—but only as "natural" activity, as instinctual or emotional labors of love. Women are thus excluded from men's conceptions of culture and its conceptual schemes of "the social," "the historical," "the human." Finally, women's actual experience of their own labor is incomprehensible and inexpressible within the distorted abstractions of men's conceptual schemes. Women are alienated from their own experience, for men's conceptual schemes are also the ruling ones, which then define and categorize women's experience for women. (This is Hartsock's point about ideologies structuring social life for everyone.) For Smith, education for women, for which nineteenth-century feminists struggled, completed the "invasion of women's consciousness" by ruling-class male experts.²⁶

²⁶Smith (1979, 143). We should note that Smith was writing on these topics earlier than the other theorists I have discussed, though her work did not become widely known in the United States until recently. The aspects of women's labor Smith identifies so clearly and so early also appear to be on the minds of the other theorists, as a perusal of their work will show.

These characteristics of women's activities are a resource that a distinctively feminist science can use. A "line of fault" develops for many women between our own experience of our activity and the categories available to us within which to express our experience: the categories of ruling and of science. The break is intensified for women inquirers. We are first of all women, who—even if single, childless, or with servants—maintain our own bodies and our places of local existence, and usually also the bodies and domestic places of children and men. But when entering the world of science, we are trained to describe and explain social experience within conceptual schemes that cannot recognize the character of this experience. Smith cites the example of time-budget studies, which regard housework as part leisure and part labor—a conceptualization based on men's experience of wage labor for others vs. self-directed activity. But for wives and mothers, housework is neither wage labor nor self-directed activity. An account of housework from "the standpoint of women"—our experience of our lives—rather than in the terms of masculine science would be a quite different account; the voice of the subject of inquiry and the voice of the inquirer would be culturally identifiable.²⁷ It would be an example of science *for* women rather than *about* women; it would seek to explain/interpret social relations rather than behavior (human "matter in motion"), and do so in a way that makes comprehensible to women the social relations within which their experience occurs.

Smith fuses here what have been incompatible tendencies toward interpretation, explanation, and critical theory in the philosophy of social science. None of these discourses locates "authoritative accounts" in those of the inquirer as an active agent in inquiry. Once Smith puts the authority of the inquirer on the same epistemological plane as the authority of the subjects of inquiry—the women inquirer interpreting, explaining, critically examining women's condition is simultaneously explaining her own condition—then issues of absolutism vs. relativism can no longer be posed. Both absolutism and relativism assume separations between the inquirer and subject of inquiry that are not present when the two share a subjugated social location.²⁸

I think Smith is arguing that this kind of science would be "objective," not because it would use the categories available from an "Archimedean," dispassionate, detached "third version" of the conflicting

²⁷Smith (1979, 154; 1981, 3).

²⁸Cf. Harding (1980).

perspectives people have on social relations but because it would use the more complete and less distorting categories available from the standpoint of historically locatable subjugated experiences.²⁹ However, it is difficult to generalize from her explicit assumptions about interpreting/explaining women's world to a feminist science that takes as its project explaining the whole world. She often admonishes the reader that the experience of the subject of inquiry (the experience of the women whose lives the inquirer is explaining) is to be taken as the final authority. But many feminist inquirers take men's experience as well as women's to be inadequately interpreted, explained or criticized within the existing "corpus of knowledge": think of all the recent writing on men's war mentality; of object-relations theory's critical reinterpretation of the masculine experience of gendering; of Smith's own rethinking of men's experiences as sociologists. Yet she does not assign ruling-class men's experience the kind of authority she insists on for women's experience; through all four papers her argument shows why we should regard women's subjugated experience as starting and ending points for inquiry that are epistemologically preferable to men's experience. (Smith's argument here is similar to Hartsock's assertion of the epistemological preferability of the categories of women's activities, and to Flax's focus on feminism as the exposure of what men repress; all three return to Hegel's passage about the master and the slave to make their points.)

Interpreting Smith in this way leaves a few loose ends in her account, but it makes sense of the origins of the scientific authority she clearly intends to give to women as both subjects of inquiry and inquirers. For her, what feminism should distrust is not objectivity or epistemology's policing of thought per se but the particular distorted and ineffectual form of objectivity and epistemology entrenched in Enlightenment science. Like Flax, Smith stresses that there will be many different feminist versions of "reality," for there are many different realities in which women live, but they should all be regarded as producing more complete, less distorting, and less perverse understandings than can a science in alliance with ruling-class masculine activity.

New Persons and the Hidden Hand of History.

Finally, it is historical changes that make possible feminist theory and consequently a feminist science and epistemology, as I have argued

²⁹Smith (1981, 6).

elsewhere.³⁰ Here, too, we can learn from the Marxist analysis. Engels believed that "the great thinkers of the Eighteenth Century could, no more than their predecessors, go beyond the limits imposed upon them by their epoch."³¹ He thought that only with the emergence in nineteenth-century industrializing societies of a "conflict between productive forces and modes of production"—a conflict that "exists, in fact, objectively, outside us, independently of the will and actions even of the men that have brought it on"—could the class structure of earlier societies be detected in its fullness for the first time. "Modern socialism is nothing but the reflex, in thought, of this conflict in fact; its ideal reflection in the minds, first, of the class directly suffering under it, the working class."³²

Similarly, only now can we understand the feminisms of the eighteenth and nineteenth centuries as but "utopian" feminisms.³³ The men and women feminists of those cultures could recognize the misery of women's condition and the unnecessary character of that misery, but both their diagnoses of its causes and their prescriptions for women's emancipation show a failure to grasp the complex and not always obvious mechanisms by which masculine dominance is created and maintained. Liberal feminism, Marxist feminism and perhaps even the more doctrinaire strains of the radical and socialist feminisms of the mid-1970s do not have conceptual schemes rich or flexible enough to capture masculine domination's historical and cultural adaptability, nor its chameleonlike talents for growing within such other cultural hierarchies as classism and racism.³⁴ More complex and culture-sensitive (though not unproblematic) analyses had to await the emergence of historical changes in the relations between the genders. These changes have created a massive conflict between the culturally favored forms of producing persons (gendered, raced, classed persons) and the beliefs and actions of increasing numbers of women and some men who do not want to live out mutilated lives within the dangerous and oppressive politics these archaic forms of reproduction encourage.

If we cannot exactly describe this historical moment through an analogy to a "conflict between productive forces and modes of pro-

³⁰Harding (1983b). As I shall show, I now have postmodernist questions about my earlier defenses of the standpoint epistemologies.

³¹Engels (1972, 606).

³²Engels (1972, 624).

³³O'Brien (1981) also makes this point.

³⁴For an analysis of these four main forms of feminism, see Jaggar (1983).

duction" (and why should we have to?), we can nevertheless see clearly many aspects of the specific economic, political, and social shifts that have created this moment. There was the development and widespread distribution of cheap and efficient birth control, undertaken for capitalist and imperialist motives of controlling Third World and domestically colonized populations. There was the decline in the industrial sector combined with growth in the service sectors of the economy, which drew women into wage labor and deteriorated the centrality of industrialized "proletariat" labor. There were the emancipatory hopes created by the civil rights movement and the radicalism of the 1960s in both the United States and Europe. There was the rapid increase in divorce and in families headed by females—brought about in part by capitalism's seduction of men out of the family and into a "swinging singles" lifestyle, where they would consume more goods; in part by women's increased, though still severely limited, ability to survive economically outside of marriage; and no doubt in part by an availability of contraceptives that made what in olden days was called "philandering" less expensive. There was the increasing recognition of the feminization of poverty (probably also an actual increase in women's poverty), which combined with the increase in divorce and the drawing of women into wage labor to make women's life prospects look very different from those of their mothers and grandmothers: now women of every class could—and should—plan for lives after or instead of marriage. There was the escalation in international hostilities, revealing the clear overlap between masculine psychic needs for domination and nationalist domination rhetoric and politics. No doubt other significant social changes could be added to this list of preconditions for the emergence of feminism and its successor science and epistemology.

Thus, to paraphrase Engels, feminist theory is nothing but the reflex in thought of these conflicts in fact, their ideal reflection in the minds first of the class most directly suffering under them—women.³⁵ Feminist science and epistemology projects are not the products of observation, will power, and intellectual brilliance alone—the faculties that Enlightenment science and epistemology hold responsible for advances in knowledge. They are expressions of ways in which nature and social life can be understood by the new kinds of historical persons created

³⁵See Faderman (1981, 178–89) for a valuable analysis of the similar "causes" for the nineteenth-century women's movement in England and America.

by these social changes.³⁶ Persons whose activities are still characteristically "womanly," yet who also take on what have traditionally been masculine projects in public life, are one such important group of new persons. This "violation" of a traditional (at least, in our recent history) gendered division of labor both provides an epistemically advantaged standpoint for a successor science project and also resists the continuation of the distorting dualities of modernism. Why should we be loath to attribute a certain degree of, if not historical inevitability, at least historical possibility to the kinds of understandings arrived at in feminist science and epistemology?

I still think a historical account is an important component of the feminist standpoint epistemologies: it can identify the shifts in social life that make possible new modes of understanding. A standpoint epistemology without this recognition of the "role of history in science" (Kuhn's phrase) leaves mysterious the preconditions for its own production. However, I now think that the kind of account indicated above retains far too much of its Marxist legacy, and thereby also of Marxism's Enlightenment inheritance. It fails to grasp the historical changes that make possible the feminist postmodernist challenges to the Enlightenment vision as well as to Marxism. We postpone until the next chapter a fuller discussion of this issue.

We saw in Chapter 1 that the feminist empiricist strategy argues that sexism and androcentrism are social biases, prejudices based on false beliefs (caused by superstitions, customs, ignorance, and mis-education) and on hostile attitudes. These prejudices enter research particularly at the stage of the identification and definition of scientific problems, but also in the design of research and in the collection and interpretation of evidence. According to this strategy, such biases can be eliminated by stricter adherence to the existing norms of scientific inquiry. Moreover, movements for social liberation "make it possible for people to see the world in an enlarged perspective because they remove the covers and blinders that obscure knowledge and observation."³⁷ The women's movement creates the opportunity for such an

³⁶Chapter 9 outlines the precedents for this kind of analysis in accounts of the breakdown of the medieval division of labor, which permitted the emergence of the new class of craftspeople who created experimental observation in the fifteenth century. See Zilsel (1942) and Van den Daele (1977).

³⁷Millman and Kanter (1975, vii).

The Science Question in Feminism

enlarged perspective and, also creates more women scientists, who are more likely than men to notice androcentric bias.

However, this justificatory strategy undermines key assumptions of its parental empiricist discourse (to paraphrase a point of Zillah Eisenstein's, feminist empiricism has a radical future), and in this undermining—this internal incoherence—we can recognize this epistemology's transitional character and the potential wellsprings of its radicalism.³⁸

Feminist empiricism challenges three related and incoherent assumptions of traditional empiricism. First, it questions the assumption that the social identity of the observer is irrelevant to the "goodness" of the results of research, asserting that the androcentrism of science is both highly visible and damaging, and that its most fecund origin is in the selection of scientific problems. It argues that women *as a social group* are more likely than men *as a social group* to select problems for inquiry that do not distort human social experience. Second, feminist empiricism questions the potency of science's methodological and sociological norms to eliminate androcentric biases; the norms themselves appear to be biased insofar as they have been incapable of detecting androcentrism. Third, it challenges the belief that science must be protected from politics. It argues that *some* politics—the politics of movements for emancipatory social change—can increase the objectivity of science. Because the feminist empiricist justificatory strategies reveal the incoherences of traditional empiricism, they also create a misfit, an incoherence, between substantive feminist scientific claims and this feminist epistemological strategy used to justify them.

The recognition of these incoherences led to the development of the feminist standpoint strategies, which appear to be coherent with those elements of feminist empiricism that undermine traditional empiricism. The feminist standpoint epistemologies are grounded in those shared characteristics of *women as a social group* and of *men as a social group* that created feminist empiricism's internal incoherence. But are the standpoint epistemologies internally incoherent along other dimensions?

³⁸Eisenstein (1981); she made the point about Liberal feminism. The epistemology which is coherent with Liberal feminism is feminist empiricism.

7 OTHER "OTHERS" AND FRACTURED IDENTITIES: ISSUES FOR EPISTEMOLOGISTS

Now we are in a position to explore dimensions of the internal incoherences in the feminist standpoint epistemological projects. Let us begin by noting that perhaps the proletariat was the only epistemologically advantaged "right group" at the "right place in history" in the nineteenth century. But are women the only such group at this moment in history? If not, what are the intellectual and political relationships between feminist scientific and epistemological projects and the similar projects of the other groups? Furthermore, are women, or even feminists, a "group" in the sense required by the standpoint epistemologies? Do not *other* self-conscious political projects create in many women and feminists self-identities and political loyalties that are in tension with the metaphysics and politics of the standpoint epistemologies?

In short, can there be *a* feminist epistemological standpoint when so many women are embracing "fractured identities" as Black women, Asian women, Native American women, working-class women, lesbian women? Do not these identities undercut the standpoint assumption that common experiences as women create identities capable of providing the grounds for a distinctive epistemology and politics? Even the infamous "hyphenization" of feminist political and theoretical stances—Socialist-Feminism, Radical-Feminism, Lesbian-Feminism, Black-Marxist-Feminism, Black-Lesbian-Socialist-Feminism, Radical-Women-of-Color—bespeaks an exhilaration felt in the differences in women's perceptions of who we are and of the appropriate politics for navigating through our daily social relations. It is an exhilaration similar