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Knowledge, Human Interests, and Objectivity in Feminist Epistemology[1]

Elizabeth Anderson
University of Michigan

> Apparatchik (impatiently): How much is 2 + 2?
> Mathematician (cautiously): How much do you want it to be?
> —Soviet joke

1. MAKING ROOM FOR VALUES IN FEMINIST EPISTEMOLOGY

This joke from the former Soviet Union aptly captures the dominant view about what happens when social, political, and moral interests shape inquiry: the result is totalitarian thought control, in which those in power force beliefs to conform to their demands and wishes rather than to the facts. No wonder, then, that attempts by feminist epistemologists to legitimate important roles for social and moral values in academic inquiry have been greeted with such alarm in the recent wars over "political correctness." This paper aims to defuse the hysteria over value-laden inquiry by showing how it is based on a misapprehension of the arguments of the most careful advocates of such inquiry, an impoverished understanding of the goals of science, a mistaken model of the interaction of normative and evidential considerations in science, and a

singular inattention to the empirical facts about how responsible inquirers go about their business.

Yet, the task of defending value-laden inquiry is a formidable one. For its most careful recent advocates in feminist epistemology have advanced an ambitious agenda. Feminists have long argued that scientific practice[2] should promote women's interests by removing discriminatory barriers that prevent women from participating in research, by developing technologies that empower women (such as safe, inexpensive birth control), and by paying due regard to women's actual achievements in science and other endeavors. Many who attack the idea of value-laden inquiry are willing to accept such political influences on the conduct of inquiry, because such influences are not thought to touch what they see as the core of scientific integrity: the methods and standards of justification for theoretical claims. These influences affect the context of discovery (where the choice of subjects of investigation and of colleagues is open to influence by the interests of the inquirer or of those who fund the research) or the context of practical application (which, involving action, is always subject to moral scrutiny), not the context of justification. But feminist epistemologists argue that feminist values may properly influence scientific method and theory choice. This ambition challenges the core commitments of many scientists and defenders of the ideal of value-neutral science.

Helen Longino has developed the most careful and closely reasoned recent arguments in favor of using "contextual values"—political, moral, and other values taken from the social context in which science is practiced—to guide scientific method and theory choice.[3] Longino observes that hypotheses are logically underdetermined by the data cited in their support. A particular fact provides evidential support for a given hypothesis only in conjunction with other background assumptions. Thus, two inquirers who accept different background assumptions may take the same fact as evidence for conflicting hypotheses. The failure to observe stellar parallax in the seventeenth century was taken as evidence that the earth did not move around the sun by those who assumed that the stars were not far away. But this same fact was taken as evidence that the stars were very far away by those who believed that the earth did move around the sun. In some cases empirical support, independent of the hypothesis being investigated, can be offered for the background assumptions—although only in conjunction with yet further background assumptions. But in many other cases independent evidence for the background assumptions is not available. Furthermore, as we trace back the sources of support for the interlocking background assumptions of a theory, we find that they do not rest on factual claims alone.

This fact is most dramatically revealed in cases where the available data in conjunction with the shared background assumptions of rival researchers

are insufficient to justify the choice of one theory or research program over another. In these cases, dissenting scientists often criticize the background assumptions of their rivals and support their own contested background assumptions by appealing to conceptual, epistemological, methodological, or metaphysical considerations that often rest upon contextually specific norms of inquiry.[4] Thus, Einstein initially appealed to thought experiments grounded in empiricist epistemological norms to argue for the superiority of the theory of relativity over classical Newtonian mechanics. Watson appealed to the methodological norm that we ought to count as evidence only interpersonally accessible observations to argue for the superiority of behaviorism over introspectionist psychology. Functionalist explanation in sociology was discredited partly because it was incompatible with the nonteleological metaphysical framework of modern science: for those who accept this framework, merely pointing out that a social phenomenon promotes social stability does not provide a satisfactory explanation for why it exists. Marginal utility theory in economics triumphed over classical economic theory partly because its hypotheses could be modeled using calculus, which made many economic problems mathematically tractable for the first time. In these cases, normative considerations about the conduct of inquiry, normative constraints on the form of acceptable data and of satisfactory explanations, and normative desiderata of calculative ease proved to be powerful arguments for theory choice. Where the data run out, values legitimately step in to take up the "slack" between observation and theory.[5]

These arguments show that values embedded in background assumptions help determine what counts as evidence and an explanation, how the evidence should be represented, and what direction the evidence points to. So values play a legitimate role in guiding science that is not reducible to the prescription to simply follow where the facts lead. But this is not enough to show that any sort of value may permissibly guide science. A prominent branch of mainstream philosophy of science accepts the argument that underdetermination leaves room for values to play a legitimate role in theory choice, but it insists that the admissible values must be epistemic or cognitive, rather than, say, moral, political, or economic. Acceptable values are "internal" to science; unacceptable ones are "contextual," or borrowed from the social context in which science is practiced. Thus, Kuhn argues that the values that properly guide theory choice are accuracy, consistency, fruitfulness, breadth of scope, and simplicity.[6] These cognitive values don't have any obvious moral or political content.

A crucial question for feminist epistemologists, then, is whether the sharp division between epistemic and moral or political values is tenable. Longino argues that this division breaks down once we look beyond the content of the standards for theory choice and focus attention on the grounds for

supporting them.[7] Here we see that epistemic, metaphysical, and practical interests may all help support a given standard of theory choice. Empirical adequacy is important not just on epistemic grounds but because an empirically inadequate theory cannot satisfy our practical interests in predicting and controlling phenomena.[8] What's more, the content of our practical interests helps determine what dimensions of empirical adequacy are demanded of science. This is not surprising if we keep in mind that theories do more than represent facts—they organize them for our use. The interest in control puts a premium on theories that accurately track in quantitative terms the behavior of objects in experimental and technological contexts, where background "interfering" conditions are tightly constrained and objects are manipulated by one or very few factors under the control of the knower. The Aristotelian interest in leading a life devoted to contemplating the natures of things (rather than asserting mastery over them) put a premium on accurately accounting for the qualitative characters of objects in unmanipulated contexts, where things can display their "true natures."[9] The interest in self-understanding and successful communication puts a premium on theories that accurately account for subjects' behavior in terms that the subjects themselves can recognize, affirm, and act on.[10]

Consider, in this light, two of the theoretical virtues that Longino identifies as among those that may properly guide theory choice for feminists.[11] One is "ontological heterogeneity." This is a preference for "splitting" over "lumping"—for emphasizing the qualitative diversity and individuality of subjects of study and the distinctions among properties commonly classified together. One purely cognitive motivation for this is to seek fine-grained descriptive accuracy. Barbara McClintock's revolutionary discovery of genetic transposition, which was based on close observation of the cytological differences among individual seeds on corn cobs, demonstrates that such a focus can yield huge theoretical advances.[12] But there are political reasons for emphasizing heterogeneity as well. Ideologies that purport to scientifically demonstrate the inevitability of male dominance often appeal to theories that assimilate disparate phenomena under vague, global classifications. Feminist primatologist Linda Fedigan showed that the common idea that male primates "dominate" females is ill-conceived, by pointing out that the numerous distinct measures of individual dominance (social rank, aggressiveness, winning conflicts, strength, initiating group movement, directing group movement, suppressing conflicts among others, mobilizing cooperation) do not correlate, shift over time and context, and in some cases apply only to within-sex rather than between-sex interactions. There is no global, unitary sense of "dominance" in which the generalization "male primates dominate females" is true.[13] Another political reason for emphasizing heterogeneity is to reinforce the self-critical practices of feminism itself.

Feminist theories that focus on generalizations about "women" all too often have ignored important differences among women. In the U.S. context, this has meant that characteristics common among white, middle-class, heterosexual women have been represented as the norm for women generally, such that other women either are invisible or appear deviant within the theory.[14] What are we to make of the idea that there is something about "women's" cognitive styles that attracts them more to the life sciences than to the physical sciences or mathematics, once we consider that black women scientists are twice as likely as white women scientists to choose a mathematical specialty and only half as likely to choose the life sciences?[15] Emphasizing heterogeneity enables feminist theorists to represent diversity among women and humans generally as a potential resource rather than as deviance.

Both cognitive and political reasons can also be offered in support of a second feminist theoretical virtue: "complexity of relationship." This value supports a preference for dynamic, interactive causal models that emphasize multiple causes of phenomena over single-factor linear or reductionist models. For some theorists, this preference is motivated by a metaphysical conviction that the world is complex, multifaceted, and messy. A cognitive interest in capturing the real causal structure of the world would then concur with this preference. But feminist political interests lend other support to the value of complexity. The preference for complexity encourages historians and social theorists to represent an individual's social power as a feature of context or role supported by others rather than as an individual trait. This representation enables the recognition and appreciation of women's activities, by making "visible the role of private, domestic work in maintaining the activity and institutions of the 'public' sphere."[16] It also opens up opportunities for activists to imagine strategies of resistance to oppression that involve changing the social structure rather than attacking individuals.

Feminists are not the only ones to justify methodological and theoretical standards by appeal to moral or political considerations. Functional explanation in sociology was discredited not just because it didn't offer a satisfactory scheme of explanation but because, by representing phenomena as functional for the social order, it underplayed the significance of social conflict and discouraged criticism of the status quo. A humanist interest in acknowledging and promoting the dignity and freedom of persons has influenced many social scientists. An emerging methodological norm among interpretive anthropologists is to show one's research to the subjects of study and respond to their criticisms. This norm serves the moral interest of respecting the dignity of those one studies. Chomsky argued for the superiority of cognitive psychology over behaviorism on the ground that the behaviorist explanatory framework left no room for representing human creativity in language use, a core ground of our own self-understandings as dignified, free agents.[17] Others have

launched a similar critique of behaviorist *methods*, arguing that behaviorism's experimental framework is coercive and demeaning, depriving people of opportunities to express their potentialities for taking initiatives and forging creative solutions to problems.[18]

With all of these moral and political interests shaping methodology and standards of theory choice in so many fields and schools of thought, is there any way to salvage some conception of objectivity in science? Longino argues that there is. In the first place, empirical adequacy is not an optional standard for any research program. Although, as we have seen, moral and political interests may help delineate the domains of evidence which a theory must account for or at least be consistent with, every empirical theory is accountable to some body of evidence.[19] In the second place, all scientists are accountable to other scientists. The evidence to which they appeal must be interpersonally accessible. The methodological standards and criteria of theory choice to which they appeal must be justified to and accepted by others. The entire research community must be open to criticism by others, provide opportunities for such criticism, and respond to it by appropriately modifying its methods, claims, and background assumptions when they fall short of commonly recognized standards. Furthermore, the research community must recognize the equality of inquirers, which is to say that it may not censor or disregard what others say simply on account of their social identity or relative lack of social power.[20] These social aspects of scientific practice—the ways in which it makes each inquirer accountable to others' observations and criticism—are what secure the objectivity of science. They are what prevent inquiry from degenerating into a free play of idiosyncratic preference and subjective bias.[21]

2. THE CRITIQUE OF POLITICALLY VALUE-LADEN SCIENCE

Longino's defense of morally and politically value-laden inquiry strikes at the core self-understandings of many practicing scientists and at the core legitimation stories told about modern science to insulate it from political criticism. Thus it is no surprise that scientists and traditional epistemologists have subjected her work to pointed attacks. Susan Haack's critiques of Longino articulate better than any other the core assumptions behind the ideal of value-neutral inquiry and provide the sharpest response yet to Longino's proposals.[22]

Haack, like other defenders of value-neutral inquiry, sees many great dangers in permitting moral and political values to shape the criteria of theory choice in inquiry. Such a move would allow inquiry to be infected by

wishful thinking: people would feel entitled to infer from the fact that they wanted something to be true that it was actually true.[23] It would invite dogmatism: people would feel entitled to attack as pernicious any reasoning or evidence that did not reach a foregone conclusion supported by their political preferences.[24] It would provide a license for dishonest or less than candid research: researchers would be allowed to focus only on evidence that supports "politically correct" conclusions. The result would be the politicization of research along the lines of Nazi science, Lysenkoism, or *1984*, in which disinterested, honest researchers would be hounded out of the academy, which would henceforth be staffed by political propagandists.[25]

Why does Haack think these are the implications of introducing moral and political values into the context of justification? Behind her alarm lies a particular model of the interaction of evidential and political considerations in shaping inquiry. The model supposes that these considerations necessarily *compete* for control of inquiry. Either theory choice is guided by the facts, by observation and evidence, *or* it is guided by moral values and social influences, construed as wishes, desires, or social-political demands. To the extent that moral values and social influences shape theory choice, they *displace* attention to evidence and valid reasoning and hence *interfere* with the discovery of truth. This model depends upon a particular conception of the goals of theoretical inquiry and the nature of the considerations that can justify theory choice. The basic idea is to limit the goals of theory to the articulation of truths, and then to argue that value judgments have no evidential bearing on whether any claim is true. Therefore, value judgments cannot figure in the justification of theoretical claims or in the criteria for theory choice. It is natural to conclude that to the extent that value judgments influence theory choice, they must be diverting attention from the actual evidential support of theories. A simple logical argument supports this model:

1. Significant truth is the sole aim of theoretical inquiry.
2. Whether a theory is justified depends only on features indicative of its truth, not its significance.
3. One shows that a theory is (most probably) true by showing that it is (best) supported by the evidence.
4. A theoretical proposition is supported by the evidence only if there is some valid inference from the evidence (in conjunction with background information) to it.
5. Value judgments take the form "*P* ought to be the case."
6. There is no valid inference from "*P* ought to be the case" to "*P* is the case" (or any other factual truths).
7. There is no valid inference from value judgments to factual truths (5, 6).

8. Value judgments can provide no evidential support for theories (4, 7).
9. Value judgments can play no role in indicating the truth of theories (3, 8).
10. Value judgments can play no role in justifying theories (1, 2, 9).

I believe this argument captures the core assumptions supporting the ideal of value-neutral science.[26] The debate over the value-neutrality of science has traditionally taken (6) as the crux of the argument. But the argument is not valid as it stands. In fact, it is remarkably hard to find a valid argument against using value judgments to justify theories that hangs on (6). Particular claims are evidence for theories only in conjunction with other background assumptions [premise (4)]. Premise (6), at most, supports the conclusion that value judgments all by themselves cannot provide evidence for theories. In conjunction with background teleological laws of the form "If *P* ought to be the case, then *P* is the case," it would be easy to license an inference from value judgments to factual claims. So the argument covertly relies on a background metaphysical assumption that the universe is not governed by teleological laws. Furthermore, despite Haack's insistence that no one has ever produced a counterexample to (6), many theorists hold that "ought" implies "can"—that is, that one may validly infer from "*M* ought to do *x*" that "*M* can do *x*," which is a factual claim about *M*'s capabilities.

These flaws in the argument are not worth pursuing, however. For few contemporary defenders of value-laden inquiry stake their case on the existence of teleological laws or on the inference from "ought" to "can."[27] And no defender of value-laden inquiry has ever suggested that values figure in inquiry by licensing any direct inference from "*P* ought to be the case" to "*P*."[28] To focus the debates over values in science on premise (6) is therefore to follow a gigantic red herring. The real contests are over premises (1) and (2): the goals of theory and the relation of justification (criteria of theory choice) to those goals. I shall argue that contextual values properly enter into criteria for theory choice because the constitutive goals of scientific theory-building extend beyond the simple accumulation of bare truths and are themselves properly subject to moral and political evaluation.

But I get ahead of myself. Before we scrutinize Haack's key premises, let us consider whether the alarming conclusions she draws about the implications of contextually value-laden inquiry would follow even if her argument were sound. Haack claims that to allow contextual values to shape theory choice would be to invite wishful thinking, dogmatism, dishonesty, and totalitarianism into science. But the most her argument can so far show is that morally value-laden inquiry will not reliably track the truth. What it *will* track depends on one's further understandings of what value judgments

are. Here Haack expresses a remarkable, unexamined cynicism about the nature of value judgments. Her claim that value-laden inquiry leads to wishful thinking makes sense only if value judgments express nothing more than idle wishes or desires: propositions one would like to be true, quite independently of whether they or any other propositions are likely or possible. No serious contemporary theorist accepts such a crude account of value judgments. Even those who believe that value judgments express something more like emotional states than beliefs argue that emotional states can be warranted or not, depending on the facts.[29] So warranted value judgments, too, must be attentive to the facts. Haack's assumption that value-laden inquiry leads to dogmatism makes sense only if value judgments are essentially matters of blind, overbearing assertion, not subject to critical scrutiny or revision in light of arguments and evidence. Again, no serious moral theorist accepts this primitive emotivist view any more. Haack's assumption that value-laden inquiry will be dishonest comes from the thought that morally value-laden inquiry can only be inquiry designed to reach a foregone conclusion, hence inquiry that will neglect, cover up, or misrepresent evidence tending to show that the conclusion is false. Yet, this supposes that honesty is not itself an important moral value that should guide inquiry. Finally, Haack's charge that politically value-laden inquiry will invite totalitarianism supposes that political values are essentially totalitarian. But feminist empiricists, including Longino, are virtually all democrats and aim to extend principles of democracy to scientific practice, notably in insisting on tolerance of diverse value-laden research programs and on the equality of inquirers. Haack's alarm seems based on the nihilistic view that there is no such thing as moral inquiry at all, only arbitrary moral commitment.

Perhaps Haack's worries should be articulated as second-order ones. Her complaint about dishonesty might not be that value-laden research programs will openly embrace lying for political gain. Perhaps the worry is that if political interests are allowed to influence the domain of evidence to which a theory is accountable, then politically oriented researchers will be permitted to simply define that domain to include only those facts that favor conclusions they would like to reach. But Longino's requirement that research communities be open and responsive to criticism constrains the criteria of theory choice that can claim legitimacy. To restrict the domain of relevant evidence in the way supposed is simply a way to foreclose criticism from dissenters and hence is not permitted within the terms of Longino's defense of value-laden inquiry.

Perhaps Haack's worries about totalitarian control of science express the second-order suspicion that any collective or social values, whether totalitarian or democratic, interfere with truth-seeking by promoting "groupthink" over individualistic, autonomous inquiry. This would fit in with the

model of inquiry that supposes that social determinants of belief necessarily displace attention to the evidence. It is as if, upon turning our heads to attend to those speaking to us, we necessarily turn our attention away from the world. But Longino is right to insist that the social structure of science, provided that it ensures diversity, equality, openness, and responsiveness to criticism, functions as an essential corrective to individual error and bias. Underdetermination arguments show that individuals, left on their own, can make almost anything out of what they observe, given idiosyncratic enough background assumptions. The history of philosophical skepticism, especially its solipsistic versions, testifies to this. It is the fact that individual inquirers must justify their claims before others that forces them to appeal to evidence that others can check and to standards that others can accept. As we have seen above, the demand that we be accountable to others is what makes us accountable to the world, and thereby forecloses opportunities to tailor criteria of theory choice so that they reach a foregone conclusion or a "politically correct" one.[30]

None of the alarmist implications Haack wishes to draw from Longino's advocacy of value-laden inquiry follow from her arguments. Longino's own normative constraints on research communities guard against them. Nevertheless, Haack's central argument does express a fundamental challenge to Longino's views. Even if Longino's recommendations don't lead to a totalitarian abyss, they may lead to false belief, and that is bad enough. Longino rests her case for value-laden inquiry on a logical analysis of the evidential relation between data and theory. If, as Haack suggests, this evidential relation is something like the relation "supporting the claim to truth," then it is hard to see how value judgments can figure in this relation unless one accepts some kind of inference from "ought" to "is." Thus, Haack reads Longino as arguing that when the choice between rival theories is underdetermined by the available evidence in conjunction with shared background assumptions, then "we should decide which disjunct to accept by asking which would be politically preferable."[31] But surely Haack is right to insist that the fact that the world would be a better place if a theory were true, or the fact that one would like one theory to be true, offers no evidence for the conclusion that it really is true. Haack argues that in such cases of underdetermination one should suspend judgment rather than plump for one side for bad reasons. Even if practical considerations demand that we act on some theory, this does not justify belief in it, merely acceptance of it as if it were true.[32] Longino claims that underdetermination leaves open the permanent possibility that unarticulated moral judgments may be covertly influencing scientists' assessments of the evidence. But Haack argues that even if this is true, it argues for rigorously exposing and expunging these judgments from inquiry, not for allowing them in explicitly.[33]

Longino's arguments thus stand in need of clarification and further defense. We need an account of how value judgments can properly figure in theory choice which does not just come down to choosing a theory because it is politically preferable. Longino argues that criteria of theory choice can be simultaneously supported by epistemic and political considerations. But if epistemic considerations already support the choice of criteria, then aren't the political considerations superfluous?

I shall argue that the key dispute between Haack and Longino concerns the aims of theoretical inquiry. If these aims are broader than the bare accumulation of truths, and the justification of theories is relative to all these aims, then there is an opening for moral, social, and political values to enter into theory choice. In fact, Haack already admits that theoretical inquiry aims for more than a bare accumulation of truths. Idle inquiry has no need for theory to accumulate trivial truths. Theoretical inquiry aims at some *organized* body of truths that can lay claim to *significance* [premise (1)]. Thus, it is possible for contextual values to figure in determining what counts as significant, even if they don't figure in determining what is true. Haack forestalls this move by claiming that justification is addressed only to the question of truth, not significance [premise (2)]. Against this view, I shall argue in the following section that theoretical justification cannot avoid questions of significance. For not every set of true statements *about* a given phenomenon constitutes an acceptable theory *of* that phenomenon. Some sets offer a distorted, biased representation of the whole. This can make them unworthy representations of a phenomenon even if they contain no falsehoods. But what constitutes an adequate, unbiased representation of the whole is relative to our values, interests, and aims, some of which have moral and political import. Thus, even the project of defining the boundaries of significant phenomena may involve contextual value judgments.

3. WHY BEING TRUE MAY BE NO DEFENSE OF A THEORY

If epistemologists took murder mysteries and courtroom dramas as seriously as they take their image of science, they would learn a thing or two about the limitations of truth as a defense of an account of events. Mysteries tease theoretical reason by revealing the facts about crucial events in a sequence designed to turn readers' minds first in one direction, then in another, then in another. Although many characters in mysteries lie, the most interesting characters deceive by telling the truth—but only part of it. It is no accident that in the ritual formula of the courtroom oath one swears not only to tell the truth and nothing but the truth, but the "whole" truth. The significance of most truths can be adequately grasped only in the context of the whole

truth. Consider, in this light, the controversy over the role of Jews in the Atlantic slave system, sparked by the Nation of Islam's notorious book *The Secret Relationship between Blacks and Jews.*[34] The book stresses such claims as these: that Jews had considerable investments in the Dutch West India Company, which played a significant role in the seventeenth-century Atlantic slave trade; that Marranos (people forced by the Portuguese to convert from Judaism to Christianity) were among the major slaveowning sugar planters in Northeast Brazil; that Jews were prominent among the white colonists of Dutch Brazil and bought a large share of the slaves traded by the Dutch from the 1630s to the 1650s; and that a larger percentage of Jews living in the U.S. South owned slaves than did Southern whites as a whole.[35] These claims are all true. Yet, put together, these and the many other true claims in *The Secret Relationship* do not add up to an acceptable account of the role of Jews in the Atlantic slave system. As the historian David Brion Davis argues, even if every purported fact in the book were true, it would still offer a biased and distorted picture of the role of Jews in Atlantic slavery.[36]

The problem is not so much falsehood (although this is also present in *The Secret Relationship*) as the failure to put the facts into the larger context that would be required to assess their significance. The share of Jewish investment in the Dutch West India Company was small, and the Dutch played a significant role in the Atlantic slave trade only in the seventeenth century, when the trade was small. Slaveowning Marranos were not in Northeast Brazil by choice: Portugal had forced them to colonize the area and take up sugar production. Nor is there any reason to call them Jews, as their forced conversion had long since eliminated whatever connections they once had to Jewish culture and religion. Jews owned slaves in Dutch Brazil for only a few decades and were expelled by the Portuguese in the 1650s.[37] A greater proportion of U.S. Southern Jews owned slaves than other Southern whites only because they were concentrated in urban areas, where rates of slave ownership were higher. Moreover, Jewish slaveowners owned fewer slaves per household than the average slaveowner, because urban slaveowners owned fewer slaves than their rural counterparts. And the vast majority of U.S. Jews lived in the nonslaveholding North. Finally, the absolute numbers of Jews involved in U.S. slavery were vanishingly small: the 1830 census records only 120 Jews among the 45,000 individuals owning 20 or more slaves, and it records only 20 Jews among the 12,000 owning 50 or more slaves.[38] How are we to assess the significance of the facts cited in *The Secret Relationship*? Taken in isolation, they suggest that Jews played a special or disproportionate role in the Atlantic slave system or that their participation was more intense than that of other ethnic and religious groups. But in the context of additional facts, such as those just cited, they show that Jewish participation in the slave system was minor in absolute terms and was no different in intensity from similarly situated ethnic and religious groups. The larger context exposes a serious bias or distor-

tion in the way *The Secret Relationship* characterizes the significance of Jewish participation in the Atlantic slave system. The characterization is "partial" in the literal sense that it tells only part of the truth needed to assess the significance of the matters at hand. What matters for assessing significance, then, is not just that an account be true but that it in some sense represent the whole truth, that it be unbiased. Furthermore, the fact that an account is biased or distorted is a good reason to reject it, even if it contains only true statements. Haack's premise (2) is therefore false: to justify acceptance of a theory one must defend its significance, not just its truth.

I have argued that significance, bias, and partiality are features of theories, relevant to their justification, that need to be judged in relation to the "whole" truth and that cannot be judged simply by testing the truth-value of each claim a given theory upholds. For in offering *T* as an adequate theory or an account of a phenomenon, one purports something more than that the constitutive sentences of *T* are true. Theories don't just state facts; they organize them into patterns that purport to be representative of the phenomenon being theorized, patterns that are adequate to answer some question or satisfy some explanatory demand.[39] But what would be the "whole" historical truth about the Atlantic slave system and about the roles of different ethnic groups in it? What would be an "unbiased" representation of this phenomenon?

One might try to offer a value-neutral account of significance and bias, arguing that an unbiased theory—one that does justice to the whole truth—is one that disregards all contextual values in deciding which facts to represent or how to represent them. But what would such an account look like? The whole truth can't be an account that literally represents every fact about the phenomenon being studied. No theory offers anything close to that. Nor should any theory try. Such a representation would end up burying the significant truths in a mass of irrelevant and trivial detail (e.g., how many waves did each slave ship surmount? how many times did each slave blink?). The whole truth can't be one that rules out in advance all facts that bear on the moral assessment of slavery or of those involved in it, or that describes the phenomenon in terms that evade moral judgment. Such a representation would plainly omit most of the features of slavery that arouse our interest in studying it or else would misrepresent these features by Orwellian euphemism (e.g., by describing whipping as a "labor mobilization technique"). Such a representation would constitute collusion with those who wish to evade moral judgment themselves. I see no contextually value-neutral way to characterize the whole truth, or the significant truths, about slavery.

To get a grip on the notions of significance and wholeness, we need a fuller understanding of the goals and context of theoretical inquiry. Theoretical inquiry does not just seek any random truth. It seeks answers to questions. What counts as a significant truth is any truth that bears on the answer to the question being posed. The whole truth consists of all the truths that bear on

the answer, or, more feasibly, it consists of a representative enough sample of such truths that the addition of the rest would not make the answer turn out differently. Many of the questions we ask science to answer are motivated by contextual values and interests—that is, moral, political, cultural, economic, and other concerns drawn from the social context in which science is practiced. When these are the interests that motivate the questions we ask, then what counts as a significant truth, and the whole truth, can only be judged in relation to these interests. Thus, when the question driving inquiry is motivated by concerns with moral content, what counts as a significant truth will be whatever is *morally* relevant to addressing those concerns.

Before we can judge whether a theory is biased, then, we need to specify the question it purports to answer in such a form that we can tell whether the answer satisfactorily addresses the motivations for asking the question in the first place. The question that *The Secret Relationship* purports to answer is thus not adequately specified by such seemingly value-neutral questions as "What was the role of the Jews in the Atlantic slave system?" or even "How did Jewish roles in the slave system compare with the roles of other ethnic groups?" For these do not specify which roles and which comparisons are of interest. The question that *The Secret Relationship* implicitly purports to answer is rather "Do Jews deserve special moral opprobrium or blame for their roles in the Atlantic slave system or bear special moral responsibility for that system's operations?" The whole truth about the role of Jews in the Atlantic slave system, relative to this question, therefore consists of all the facts morally relevant to answering this question about blame and responsibility, or enough of them that adding the rest would not change the answer. *The Secret Relationship* offers a biased account with respect to this question, because it ignores facts morally relevant to answering it—for instance, facts that show that the Jews behaved no differently, from a moral point of view, than anyone else who had the opportunity to profit from the slave system.

When the questions driving inquiry are motivated by contextual values, judgments of significance and bias can only be made in relation to these values. Since significance and lack of bias are legitimate criteria of theory choice, it follows that contextual values play a legitimate role in justifying theories. It follows, also, that theories of phenomena can be criticized on the ground that the background value judgments that organize the theory's conception of significant facts are themselves unjustified. Thus, if it is a moral mistake to pass judgments of collective guilt or merit on whole ethnic groups, then there is no justification even to make "Jewish" a significant classification in historical studies of the slave trade that are aimed at addressing questions of responsibility. What justification could there be for singling out Jews as a comparison class in such studies, rather than, say, the class of people who have drooping eyelids?

Haack might object that one need not drag in moral judgments to assess questions of the bias and significance of theories. Value-neutral criteria of significance and impartiality can be constructed. Such criteria need not refer to value-laden concepts such as blameworthiness. For example, it might be claimed that an unbiased account of the Jews' roles in the Atlantic slave system is simply one that truthfully represents their roles in their "actual" proportions relative to other ethnic groups. But which roles and proportions are significant? Is it more important that a greater proportion of U.S. Southern Jews owned slaves or that they owned fewer slaves per capita? Purely "factual" criteria may be constructable, against which the significance and impartiality of an account may be judged. But this possibility merely reflects the supervenience of moral judgments on factual judgments: the fact that there can be no moral difference between two states of affairs unless there is some factual difference between them. It remains the case that *what makes a given factual criterion relevant to judging a theory's impartiality or significance is its bearing upon the answer to the contextually value-laden question that motivates the inquiry, and whether it has such a bearing is itself determined by contextual values*.

Haack might object that *The Secret Relationship* is evidence that politically value-laden inquiry is dangerous for all the reasons she cites. Indeed, it does exemplify the vices she warns about: dishonesty, dogmatism, rigging a story to reach a foregone conclusion desired for political reasons, propaganda aimed at collective agitation. But her diagnosis is mistaken. The problem is not that moral and political interests inform the framing of questions, and hence the selection and representation of significant facts in *The Secret Relationship*. The problem is that *The Secret Relationship* doesn't count as inquiry, because it is rigged to reach a foregone conclusion.[40] Inquiry seeks to answer a question. A pragmatic prerequisite to posing a (genuine) question is that one regards the answer as genuinely open (even if one has strong hunches or wishes as to how it will turn out) and that one is prepared to let evidence and arguments guide one to the answer. This implies at least that one must be open and responsive to evidence that tends in different directions, not that one just attend to evidence that supports a conclusion one antecedently favors. There is nothing in this pragmatic requirement that precludes moral and political values from framing the question and hence determining what is to count as a significant fact. If there were, then there could be no such thing as genuine jury deliberation about the guilt of people on trial—jurors could only determine guilt on the basis of prejudice. There could be no such thing as moral inquiry at all.

Historians sometimes contrast biased inquiry with inquiry that does justice to the events being narrated and to the people involved in them. That the virtue of doing justice corrects bias expresses a superior understanding of the

demands of inquiry than the ideal of value-neutrality. To adopt a stance of value-neutrality is to disregard contextual values in assessing the merits of theories. We have seen that insofar as science is driven by contextually value-laden questions, the ideal of value-neutrality leaves one incapable of coherently directed inquiry at all, because it leaves one incapable of distinguishing a significant from an insignificant fact, a biased account from one that does justice to the phenomena. One does justice not by adopting a stance of value-neutrality but by being impartial. Impartiality is not a commitment to disregard all evaluative standards but is a commitment to pass judgment in relation to a set of evaluative standards that transcends the competing interests of those who advocate rival answers to a question. These standards include honesty and fairness in judgment. To the extent that significance is judged in relation to highly contested political and moral questions, fairness demands attention to all the facts and arguments that support or undermine each side's value judgments, not a pose of value-neutrality.

4. HOW CONTEXTUAL VALUES GUIDE THEORETICAL CLASSIFICATION

I have argued that significance and impartiality are two virtues of theories that are not wholly a function of the truth-values of the claims they contain or explain. They are a function of the relation the theories bear to the background interests that drive inquiry through the way questions are framed. Many of these interests are drawn from the social context of inquiry and have moral and political content. Factual criteria of significance and impartiality are justified in relation to these interests, which in turn stand in need of moral and political justification. These criteria set legitimate standards for theory choice. It follows that moral and political values legitimately figure in the justification of theories.

How might advocates of value-neutral inquiry respond to this argument? I do not believe there is any serious possibility of escaping its implications for the study of subjects, such as history, in which our interests are overwhelmingly of a moral, political, and social character. The best the advocates of value-neutral inquiry can do is to try to limit the scope of the argument. Let us explore the most credible options.

One might try to argue that the scope of my argument is confined to the social sciences, leaving the natural sciences untainted by association with value judgments. Arguing this would require an argument that significance in the natural sciences is purely a function of questions that arise internally to the practice of science, never from the social context in which science operates. Philip Kitcher proposes such a contextually value-neutral account

of natural scientific significance. "Significant statements answer significant questions." Significant questions are roughly those that challenge the basic explanatory schemata of a theory—either to show that the schemata can be widely and effectively instantiated or that their presuppositions are true.[41] Kitcher appears to suggest, with Kuhn, that significant questions arise within the internal puzzle-solving activities of science, rather than being posed from the outside by moral and political interests.

We have long since passed the day when this interpretation could offer a complete account of sources of questions in natural science. It hearkens back to the purely contemplative ideal of inquiry that bred Scholasticism in natural science. Bacon correctly foresaw that modern science was not to take this path. Modern natural science is unimaginable apart from technology. To the extent that we call for technological applications of the natural sciences, such a value-neutral explication of scientific significance cannot work. The constitutive goals of many natural sciences include the promotion of particular contextual values. The constitutive aim of medicine is the promotion of health; of horticulture, the advancement of our abilities to grow food and other useful plants; of engineering, the construction and manipulation of useful artifacts. We rightly judge the significance of questions and answers in these fields in relation to these practical interests.

Perhaps, then, the scope of my argument includes the social sciences and "applied" natural sciences but leaves the "pure" natural sciences (and even more pure mathematics) untouched. This distinction between "pure" and "applied" science has become progressively harder to draw in the material conditions in which we practice modern science. Is physics a "pure" science? In the twentieth century, a highly significant question for physics has been: under what conditions will a mass of fissionable material enter into an uncontrolled nuclear reaction? This question is significant only because states have conceived a political interest in building nuclear weapons and have funded most research in physics with military ends in mind. Is even number theory a "pure" science? A significant question in number theory includes: what algorithms can rapidly factor very large numbers? This question is significant only because states and businesses have political and commercial interests in constructing and decoding encrypted messages. There is no clear way to isolate a special subset of sciences or fields of inquiry in which no such interests play a role in defining significance, and hence in which no such interests play a role in theory choice. Moreover, once we admit that contextual interests play a role in defining significance in such areas as medicine, engineering, and horticulture, the quest for a contextually value-neutral science seems silly. For everyone acknowledges that medicine, engineering, and horticulture yield genuine knowledge. This proves that contextual interests can play a legitimate role in justifying scientific theories without compromising the search for truth.

A second response to my argument about significance is to claim that significance plays a role only in the context of discovery, not in the context of justification. Everyone agrees that contextual values may play a legitimate role in directing scientists' attention to specific subject matters and questions. So perhaps the boundaries of a given scientific inquiry—of what is to count as the "whole" subject matter of interest—are determined by contextual values. But what we subsequently discover about the structure of that whole is purely a matter of the nature of things, not a function of our values. Values may tell us where to cast the spotlight, but nature tells us what the spotlight reveals. Specifically, nature tells us what classifications or descriptive categories theories must deploy. Value judgments therefore do not shape the content of theories even if they delineate their scope.

This argument depends on the view that the classifications and descriptive categories of science track natural kinds. Phenomena may be grouped together into natural kinds if and only if they have common causes or effects—that is, if and only if there exist causal regularities connecting each of the phenomena in the group to phenomena in some other group. These are the classifications with epistemic significance.[42] Since the universe doesn't care about us, the causal regularities of the universe exist independently of human interests. It follows that nature divides itself into kinds independent of human interests. The project of science is to discover the language nature uses to classify itself and thereby the laws nature uses to govern itself. This project can succeed only if we set aside our own anthropocentric classifications and read the book of nature in the language of nature itself.

The scope of this argument is highly limited at best. When contextual values shape the questions posed of science, and hence what counts as a significant fact, they thereby inform the classifications used in science. The classifications are justified because they track particular conceptions of human interests, not because they unify the phenomena conceived in nonanthropocentric terms or out of relation to human interests. Medicine, a branch of applied biology, classifies organisms living in the human body into pathogenic and nonpathogenic. This classification tracks human interests in health.

One might object that there is an independent, nonanthropocentric rationale for this classification in medicine. Organisms that cause disease in humans are grouped together because they reduce human reproductive fitness, and hence have a common causal impact on the course of human evolution. But if our interest is in classifying organisms according to their impact on reproductive fitness, we would not group them exactly the way medicine does. Some nonpathogenic microorganisms cause bad breath. Arguably, these organisms reduce the reproductive fitness of their human hosts because of sexual selection. Some pathogens cause trivial ailments, such as the common cold, that have no impact on survival, fertility, or attractiveness to a sex-

ual partner. Medical and evolutionary classifications of organisms cut across each other, each bearing different causal relations to other phenomena.

This case illustrates the fact that the world is too complex and messy to be organized into a few layers of all-inclusive and mutually exclusive classifications that account for all causal regularities.[43] For each classification that supports some causal regularity, there are likely to be some other cross-cutting ones in the neighborhood that bear a causal relation to some other phenomenon. So criteria of epistemic significance alone do not tell us which classifications to base our theory on.

Consider unemployment rates. The unemployed are defined as those people not engaged in work for pay and who are actively seeking such work. Why not also include discouraged workers—those who want such work but have given up looking because search would be futile? The official story is that discouraged workers exert no downward pressure on wage rates. To include them in the unemployment rate would result in a classification that fails to bear a tight causal relationship with wage rates. But if they were included, the unemployment rate would likely bear a closer causal relationship with other variables, such as divorce, poverty, and crime rates. In any event, if the unemployment rate is supposed to capture just those job seekers who actually exert a downward pressure on wage rates, it would have to exclude unskilled, inexperienced workers who are eligible only for minimum-wage jobs, and include part-time workers seeking full-time work. The unemployment rate as currently defined appears to serve a different interest: to delineate the class of jobless people toward which the state expresses some limited concern, either in political rhetoric or actual policy (such as unemployment insurance). In the framework of American individualist ideals, the unemployed as currently defined represent the relatively "deserving unemployed" because they, unlike discouraged workers, are still trying to help themselves.

Unemployment statistics also incorporated a subtle sexist bias until 1994, when the methods for collecting employment information were changed. Employment information is collected through random telephone surveys. Under the pre-1994 interview protocols, if an adult man answered the phone, he would be asked, "What were you doing most of last week—working or something else?" But adult women would be asked, "What were you doing most of last week—keeping house or something else?"[44] For women who spend more hours keeping house than working for pay, the accurate response is "keeping house," even if they are employed part-time. The question suggests to women that the interviewer is interested only in "regular" employment as defined by an androcentric norm: full-time employment that displaces domestic responsibilities. Subsequent questioning, influenced by this suggestion, failed to identify all the women who had, or were seeking, part-time work. The statistics therefore underestimated both women's

labor-force participation rates and their unemployment rates.[45] The pre-1994 employment statistics thus reflected (perhaps unexamined) sexist political assumptions about what kind of paid work is significant enough for public policy that the state ought to know about it. The protocol treated some women's part-time work as unimportant, in accord with the once widespread view that such work is a luxury that women and their families don't really need, hence not a proper subject for public concern.

The mere fact that normative political judgments inform the definition of unemployment is not a count against its use in science. It would be absurd to confine economics to studying matters of no political concern. The fact that political norms help define economic classification also does not deprive it of epistemic interest. To the extent that such classifications become incorporated into public policies, the act of delineating a given classification helps produce a system in which the classification becomes causally connected to other events. The Federal Reserve Bank treats the unemployment rate as an inflation barometer and tends to hike interest rates when the unemployment rate as defined by the theory drops below a specified level. So when the Bureau of Labor Statistics revised its interview protocols in 1994 to eliminate sex-differentiated questioning, it thereby made a new causal regularity true of the U.S. economy: one in which women's part-time employment-seeking activities came to have a stronger causal relationship to interest rates. The very act of using a theory to shape public policy endows the theory's classifications with epistemic significance.

The fact that a theoretical classification satisfies a standard of epistemic significance—namely, that its members bear a genuine causal relation to some other phenomenon—is therefore not sufficient to show that the theory that represents the world in terms of that classification is value-neutral. This is so, firstly, because any number of other classifications in the neighborhood could equally well satisfy this standard of epistemic significance. Some further justification is therefore needed for theorizing the world in terms of the classification selected, a justification which may well come from contextual values. Secondly, the political and economic conditions under which modern science is practiced deprive it of the ivory tower defense—that is, the defense of purely contemplative interest, divorced from practical relevance. Modern science is an expensive enterprise, largely funded by the state and business, which produces knowledge that these institutions subsequently use to shape their own policies. When theoretical classifications gain their epistemic significance *because* institutions have subsequently incorporated them into their policies, scientists are hardly in a position to disclaim responsibility for the results. Nor may they claim that their theorizing is neutral among contextual values.

The proper response to this fact is to recognize that theoretical classifications in science that answer questions raised by contextual interests require

a dual justification. They must satisfy some standards of epistemic significance: there must be clear empirical criteria for determining when phenomena fall under a classification, some phenomena must actually meet these criteria, the classification must figure in some explanation or some causal or empirical regularity. Such classifications must also pass scrutiny from the standpoint of contextual interests and values. They must track the underlying contextual values accurately; that is, they must group phenomena together that share a common relation to these interests. And the contextual values themselves must be justified from an ethical point of view. Judged from this dual perspective, the 1994 change in the unemployment classification was only vaguely justified on epistemic grounds. The decline in the proportion of full-time, "regular" jobs probably makes a more complete recording of part-time work more important for modeling the impact of employment on variables such as GNP. On the other hand, to the extent that a lower ratio of the newly included women seeking part-time work are eligible for above-minimum-wage jobs than those already included, the new unemployment statistics will bear a weaker relationship to wage rates. From a purely epistemic point of view, there is not much to choose between the two classifications. The better grounds for choice are straightforwardly political: economic theories should prefer the 1994 definitions because women's part-time work is important to themselves and their families, and because economists and public-policy framers should be nonsexist in their treatment of men's and women's employment aspirations.

The need for dual justification of theoretical classifications opens up additional avenues for contextual value-judgments to play a role in theory choice. Two types of contextual criticism are particularly important. The first type broadly accepts the background contextual values that support a given classification but criticizes the theory for misconceiving these values, and thereby misclassifying phenomena. It might lump phenomena together that should be separated in different classes or exclude phenomena that should be included. For example, one might support the value of health that underwrites the classification of some things as diseases but question the inclusion of particular phenomena in the category of disease. Some criticisms of medical theories, particularly in psychiatry, clearly take this form. Is homosexuality a disease, a sin, or a normal variant expression of human sexuality? Is alcoholism a disease or a moral vice? Was Catherine of Siena, the fourteenth-century pus-drinking saint, manifesting symptoms of an atypical form of anorexia or expressing her religious humility? Are people today who are engaged in similarly shocking acts of self-mortification, mentally ill or just very religiously devoted? The answers to these questions depend on ethical inquiry devoted to clarifying the boundaries of health, moral virtue, and reasonable religiosity; inquiry which in turn depends on empirical evidence. In these cases, moral criticisms object to the ways medicine *conceives* of the

phenomena, not just to immoral treatment practices, such as the failure to obtain informed consent. They are criticisms of the theory itself, not just of its practical applications.

The second type of contextually value-laden criticism of theories rejects the legitimacy of the background values that underwrite the classification in the first place. Feminist researchers have been particularly active in criticizing theoretical classifications that presuppose the legitimacy of sexist and androcentric values. For example, much research in psychology classifies personality characteristics and personal preferences into "masculine" and "feminine" types. This classification represents as gender-deviant any subjects whose biological sex does not match the gender the theory assigns to their traits and preferences. Thus, Ehrhardt's famous studies of girls prenatally exposed to high levels of androgens describe them as "tomboys" because they exhibit supposedly "masculine" behaviors such as a preference for active, outdoor play.[46] Longino criticizes such gender polarized classifications because they presuppose the legitimacy of the normative judgment that some traits are more appropriate to one gender than another.[47] The classifications thus normalize individuals who rigidly conform to sex-role stereotypes and pathologize individuals who do not. A nonsexist alternative scheme would repudiate such gender polarization and represent such traits and preferences as simply human, equally available to both sexes and belonging to no sex in particular.[48]

The changes in conceptual schemes for psychological research into gender that feminist normative criticism has recommended are not just window dressing. They open up opportunities for exploring human potentialities that were foreclosed under more rigid conceptual schemes. The old Terman-Miles M-F test, a device for measuring "masculine" and "feminine" personality, conceives of these qualities as bipolar opposites on a single continuum. Sandra Bem posed one of the earliest feminist challenges to this scheme in her alternative Bem Sex-Role Inventory, which asks individuals to report how far they identify with various culturally stereotyped masculine and feminine attributes.[49] Unlike the Terman-Miles M-F test, the BSRI does not code low identification with a stereotypically masculine attribute (e.g., liking to hunt) as in itself a feminine attribute (or vice versa). Her conceptual scheme thus made it possible to empirically study two alternative personality orientations that could not even be represented by the old test: androgyny, in which an individual registers high degrees of identification with both masculine and feminine stereotypical attributes, and a gender undifferentiated personality, in which an individual does not see gender-coded attributes as particularly salient in his or her own self-understanding. Feminist critics of Bem's work have pointed out that her challenge to gender-polarized conceptual schemes is incomplete. Although her concept of androgyny enables us to see how individuals can reject rigid gender stereotyping of their own sex with-

out thereby identifying with the "opposite" sex, it still represents androgynous individuals as blending already gender differentiated attributes and so remains conceptually dependent on a gendered classification of attributes.[50]

More recent feminist psychological research challenges a different ontological assumption behind gender classification: the idea that masculinity and femininity are individual personality traits. A trait is something that an individual carries from one social context to another. The trait conception of gender has normative implications. It makes it difficult to imagine how gendered individuals could operate successfully in social contexts that demand expression of the "opposite" gender traits. It therefore suggests that certain social changes desired by feminists, such as getting men more involved in child care, are unachievable, hence foolishly sought. An alternative is to view gender as a dynamic feature of the social context, dependent on the presence and expectations of others, that elicits different behaviors from individuals who have full repertoires of human capabilities, including those that culture labels "masculine" and "feminine."[51] This conception of gender enables an even more expansive representation of human potentialities than Bem's. It allows that even those men and women who express rigidly gender stereotyped behaviors in some social settings, where gendered expectations and sanctions are high, may be able to express themselves more flexibly in other contexts.

5. THE COGNITIVE VALUE OF FEMINIST THEORETICAL VIRTUES: FROM CLASSIFICATION TO METHOD

These cases of politically motivated feminist conceptual criticism illustrate two of Longino's feminist theoretical virtues in action. Longino's critique of Ehrhardt's gender stereotyped classifications and Bem's alternative to the Terman-Miles M-F test reflect the virtue of ontological heterogeneity. This virtue involves a commitment both to ensure that a theory's conceptual scheme makes room for the representation of human potentialities that feminists value and to represent these potentialities as normal variations rather than as deviance, defect, or pathology. The contextual conception of gender reflects the virtue of complexity of relationship. This virtue involves a commitment to represent humans' potentialities for flexible behavior in response to altered understandings of themselves and others.

These theoretical virtues are feminist in the sense that they reflect certain contextual values in which feminists take an interest. The virtues are not the exclusive possession of feminist theorists. Indeed, many fields of inquiry not particularly associated with feminism have embraced them. Interpretive anthropology has long favored splitting over lumping—representing cultural differences as normal variations of human potentials rather than neglecting

or relegating them to the lower ranks of deviance. Cognitive psychology incorporates complexity by stressing the causal role of agents' internal representations in human behavior, and hence the potential to change behavior by changing agents' self-conceptions. Chomsky in particular has emphasized the advantages cognitive psychology has over behaviorism in providing a model of human behavior with sufficient internal complexity to represent our potential for linguistic creativity.

Critics of contextually value-laden inquiry might agree that it would be nice if we humans really did have the potentialities feminists, cultural anthropologists, and cognitive psychologists prefer to represent us as having. But how can this provide legitimate cognitive grounds for thinking that we do in fact have these potentialities? How can this preference provide legitimate grounds for theory choice? Doesn't appeal to these values in theory choice reflect the very errors of wishful thinking, insistence on a foregone conclusion, and deducing "is" from "ought" that Haack and other critics object to?

No advocate of heterogeneity and complexity argues that the desirability of human flexibility, autonomy, and creativity is evidence that we really are flexible, autonomous, and creative. Rather, advocates argue that because these are valuable potentialities, it is important that our conceptual schemes be able to represent us as having them, if indeed we do. Perhaps it is the case that gender is a fixed, bipolar individual trait. But feminist critique shows that at best this could be an empirical fact about us, not a conceptual truth. Thus, theoretical schemes that leave no conceptual space for representing us otherwise are defective. Bem's scale leaves open the empirical possibility that no one scores as androgynous or undifferentiated. The Terman-Miles M-F test represents an inferior conceptualization of gender, because it does not make room for the empirical possibility that individuals could be androgynes or undifferentiated. The contextual conception of gender as process rather than as trait opens up a further possibility not available in Bem's scheme: that individuals could express rigidly gendered preferences and behaviors in some social settings but not in others. Again, this more expansive, complex conceptualization does not rule out the possibility of discovering that the gendered dispositions displayed by an individual in one setting carry through to all others. But within this framework, discovering this would count as a genuine empirical discovery, not as an artifact of the conceptual scheme of the theory.

Chomsky's critique of Skinner's theory of verbal behavior is on a par with this logic. His argument was not based on a comparison of the empirical adequacy of the two frameworks. For cognitive psychology does no better than behaviorism in explaining why a person utters a specific sequence of words on a particular occasion. The case for the superiority of the cognitive framework is that it at least offers a scheme for *representing* us as potentially free and creative (however inadequately this scheme is presently

sketched-in), whereas behaviorism forecloses such representational possibilities in advance.

Theoretical justification, on this view, proceeds on two tracks: normative and evidential. Contextual values determine what phenomena are so significant that a theory ought to represent them when they exist. Evidence indicates when those phenomena are instantiated. There is no question here of making up stories about women's or men's abilities, activities, or achievements, nor of deciding to believe they exist because it would be nice if they did. Nor, where the evidence for rival hypotheses is inconclusive, is there any question of simply holding that one hypothesis is false because it reaches a politically unpalatable conclusion.[52] Longino does, of course, express a "preference for a neurobiological model that *allows* for agency, for the efficacy of intentionality" (emphasis mine), partly on the political grounds just discussed.[53] But this hardly amounts to rigging a foregone conclusion by calling for "a way of doing science that will negate *any* possibility of biological determinism."[54] Longino expresses a preference for models that *allow* for agency—that is, that preserve the possibility of representing us as agents, if that is what we are. This hardly negates the possibility of determinism. Intentionalist models of human behavior still need to be supported by evidence. If we can't find evidence that people change their behavior in response to changes in the way they conceive of themselves and their circumstances, then intentionalist models will die for failure to produce instantiations of their explanatory schema. Nothing in Longino's expressed preference or in her methodological recommendations guarantees that intentionalist theories will be fruitful. Political interests in preserving representational possibilities also shape methodological preferences. Feminists' political interests in respecting differences among women have been a major spur toward the development of qualitative research methods, often motivating a preference for open-ended, face-to-face interviewing and participant observation over telephone or mail surveys with fixed, researcher-defined responses. Similar concerns for respecting the subjects of study have moved anthropologists to open their work to criticism from their subjects and have moved critics of behaviorism to reject the coercive and demeaning experimental methods of operant conditioning.

Haack's model of cognition, which represents the influence of ethical and cognitive considerations on cognition as necessarily competitive, can at best represent such politically grounded methodological preferences as permissible external ethical constraints on research. Perhaps some of them could be seen as equivalent to the requirement that scientists obtain informed consent before experimenting on subjects. Scientists may be morally required to respect their subjects, but such requirements should still be viewed as constraining rather than enabling the discovery of truth. Thus, cultural anthropologists who share their research with their subjects may be seen as

doing a decent thing in treating their subjects with more dignity than lab rats. But sharing research may still compromise the search for truth by giving researchers a motive to soften their representations of their subjects so as not to arouse ill-will.

In contrast with this view, the justice model of unbiased, objective research enables us to see how the expression of certain ethical interests in research can have positive cognitive value. Researchers fulfill the *cognitive* demand to do justice to the subject of study precisely by fulfilling the *ethical* demand to do justice to the individuals being studied. Justice requires that one respect, recognize, and acknowledge the autonomy and valuable potentialities of others. This requirement meshes with the politico-cognitive interest in constructing conceptual space in our theories for the representation of valuable human potentialities. If it is important to represent ourselves in our theories as possessing certain potentialities when we actually have them, then we ought to develop and employ research methods that enable us to find out about them. This requires that research methods enable the subjects of research to express these potentialities, if they do have them. Open-ended interviewing and sharing research with subjects enables subjects to express novel ideas and offer creative interpretations of phenomena that the researcher did not already anticipate. Noncoercive observational settings give subjects opportunities to take initiatives not available in behaviorist experiments. These research methods thus open up opportunities for eliciting, observing, and understanding important phenomena that other methods do not.

One can accept the importance of expressing certain political interests in conducting research and framing research results without descending into dogmatism. Heterogeneity and complexity are feminist theoretical virtues, but they are not unconditional ones. Sometimes it is more important to stress common features of women's condition than to focus on differences. Quantitative research methods inevitably abstract from fine-grained differences and thus homogenize the phenomena to some extent. But some questions of interest to feminists can only be answered with quantitative methods.[55]

6. A COOPERATIVE MODEL OF THE INTERACTION OF NORMATIVE AND EVIDENTIAL CONSIDERATIONS IN THEORY CHOICE

The critique of contextually value-laden science depends on the assumption that truth is the only goal of science—or at least the only goal relevant to justifying theories. On this assumption, it is practically inevitable that any influence on theory choice other than evidence (considerations that support

the claim to truth) must be viewed as *competing* with the evidence for our beliefs. Value judgments, social interests, wishes, and political demands in themselves have no evidentiary status. They do not support claims to truth. Therefore, to the extent that they influence theory choice, they must be seen as displacing attention to the evidence and diverting the search for truth.

I have defended an alternative conception of science, which holds that there are many goals of scientific inquiry. Multiple goals support multiple grounds for criticizing, justifying, and choosing theories besides truth.[56] Because modern science exists in large part to serve human interests, some of these goals and grounds are based on contextual values. I have identified three ways in which contextual values may shape legitimate grounds for theory choice.

First, all inquiry begins with a question. Questions direct inquiry by defining what is to count as a significant fact and what is a complete or adequate account of a phenomenon. A significant fact is one that bears on the answer to the question; an adequate account (one that represents the whole truth) is one that captures enough of the phenomenon that the addition of further detail will not change the answer. Many of the questions we ask science to answer come from the social context of science, not from its internal puzzle-generating activities. The constitutive goals of many sciences, such as engineering, medicine, and economics, are so contextually value-laden that it hardly makes sense to suppose that they have an "internal" source of questions independent from the social context in which they operate. When a theory or account of some phenomenon is taken to address some contextually value-laden question, it is therefore subject to criticism on at least three contextually value-laden grounds. The theory, although it asserts nothing but truths, may be trivial, insignificant, or beside the point: it doesn't address the contextual interests motivating the question. Or, although it asserts nothing but truths, it may be biased: it offers an incomplete account, one that pays disproportionate attention to those pieces of significant evidence that incline toward one answer, ignoring significant facts that support rival answers. When the question which the theory seeks to answer has moral or political import, the charge of bias can only be made relative to an assessment of the moral and political relevance of the evidence the theory cites. Such assessments of course depend upon moral and political value judgments. Finally, the theory may be objectionable for trying to answer a question that has illegitimate normative presuppositions.

Second, questions based on contextual interests require answers expressed in terms that track those interests. Contextual values come to directly inform the content of theories not simply by delineating the body of significant truths but by shaping how we ought to describe them. Purely epistemic criteria of significance are not sufficient to define our theoretical classifications. The

world is complex and messy enough that it is all too easy to come up with taxonomies that meet basic standards of epistemic significance. So which classifications should we pick? The interests behind the questions driving inquiry tell us which classifications to use: ones that group phenomena that bear a common relation to these interests. It follows that theories embodying such classifications can be criticized on at least two normative grounds. They may misconceive the relevant, legitimate interests, and thereby classify together phenomena that should be separated or exclude phenomena that should be included in a class. Or a theoretical classification may be based on illegitimate contextual values and for that reason should be rejected altogether.

Third, questions based on contextual interests can only be answered by methods adequate to reveal the phenomena those interests classify as significant. A theory can therefore be criticized for relying on methods that foreclose the possibility of discovering that we have certain valuable potentialities or that certain important differences or similarities exist among the subjects being studied.

The introduction of multiple goals of inquiry allows us to model the interaction of normative and evidential considerations as cooperative rather than competitive. Contextual values aid empirical inquiry by identifying relevant facts and sources of evidence, shaping conceptual schemes for describing observations, and inspiring methodological innovations that open new avenues for empirical discovery adequate for answering contextually value-laden questions. This cooperative model of inquiry supports a dual-track model of theoretical justification. On this view, theory choice is properly based on both normative and evidential considerations. Contextual values set the standards of significance and completeness (impartiality, lack of bias) for a theory, and evidence determines whether the theory meets the standards. Contextual values help define what counts as a meaningful classification and the empirical criteria for identifying things falling under it, and evidence determines what, if anything meets these criteria. Contextual values help determine what methods are needed to answer a question, and evidence gathered in accordance with those methods help answer it. In each case, evidential and normative considerations cooperate; neither usurps the role of the other.

The need for dual justification prevents wishful thinking and dogmatic insistence from counting as evidence for belief. Contextual value judgments do not play the same role that evidence does in supporting truth claims. But they do play a role in determining what the evidence means: what it points to, how it should be described. No advocate of value-laden inquiry argues that when the evidence is insufficient to justify belief in one of two rival theories, one may take the desirability of one conclusion as evidence for its truth. But contextual values do provide grounds for preferring theories that leave open

the possibility of representing certain claims as true and for methods that leave open the possibility of discovering that we have certain valuable capacities.

My defense of value-laden inquiry suggests that good science is morally value-laden in a more global sense as well: it embodies the virtue of justice. Not value-neutrality, but justice, offers the proper model of objectivity in science. Justice includes the demand to do justice to the subjects of study as well as the demand to do justice to other inquirers: to respect them as equals, to respond to their arguments, evidence, and criticisms, to tolerate the diversity of views needed to secure the objectivity of science as a social practice. The lesson of this defense of value-laden science is not totalitarian, but pluralistic and tolerant.

NOTES

1. I would like to thank Sally Haslanger, Hugh Lacey, and the faculty and students at Johns Hopkins University and the University of Toronto for helpful comments and criticisms of the ideas presented in this paper.
2. I use "science" in the inclusive sense of the German "Wissenschaft," which comprehends not just "science" in the English sense of the natural and social sciences, but all disciplined inquiry found in the academy, including the humanities, mathematics, law, public health, and engineering. I often use "science" rather than the generic "inquiry" to signify that my primary interest is in disciplined, systematic inquiry subject to institutionalized means of quality control (e.g., peer review).
3. Helen Longino, *Science as Social Knowledge* (Princeton, N.J.: Princeton University Press, 1980). See also Lynn Hankinson Nelson, *Who Knows: From Quine to a Feminist Empiricism* (Philadelphia: Temple University Press, 1990).
4. Thomas Kuhn, *The Structure of Scientific Revolutions*, 2d ed. (Chicago: University of Chicago Press, 1970).
5. Nelson, op. cit., 173–4, 248.
6. Thomas Kuhn, "Objectivity, Value Judgment, and Theory Choice," in his *The Essential Tension* (Chicago: University of Chicago Press, 1977), 320–339.
7. Helen Longino, "In Search of Feminist Epistemology," *Monist* 77 (1994): 472–485.
8. Ibid., 481.
9. Mary Tiles, "A Science of Mars or of Venus?" *Philosophy* 62 (1987): 293–306.
10. Jürgen Habermas, *Knowledge and Human Interests*, tr. Jeremy Shapiro (Boston: Beacon Press, 1971).
11. Longino, "In Search," 477–478.
12. See Evelyn Fox Keller, *A Feeling for the Organism* (New York: Freeman, 1983).
13. Linda Fedigan, *Primate Paradigms* (Chicago: University of Chicago Press, 1992), ch. 7.
14. bell hooks, *Feminist Theory from Margin to Center* (Boston: South End Press, 1983).
15. Donna Haraway, *Primate Visions* (New York: Routledge, 1989), 296.
16. Longino, "In Search," 478.
17. Noam Chomsky, "Review of B. F. Skinner's *Verbal Behavior*," *Language* 35 (1959): 26–58.
18. Barry Schwartz and Hugh Lacey, *Behaviorism, Science, and Human Nature* (New York: W. W. Norton, 1982).

19. Helen Longino, "Essential Tensions—Phase Two: Feminist, Philosophical, and Social Studies of Science," in Louise M. Antony and Charlotte Witt, eds., *A Mind of One's Own* (Boulder, Colo.: Westview Press, 1993), 261–263.
20. Critics of the equality requirement assume that it tells us to disregard individual differences in expertise and cognitive ability. But the requirement only tells us not to rank the worth of inquirers' contributions on the basis of their social status. For further defense of the equality requirement and its relation to claims of expertise, see Elizabeth Anderson, "The Democratic University: The Role of Justice in the Production of Knowledge," *Social Philosophy and Policy* 12 (1995): 186–219.
21. Longino, *Science as Social Knowledge*, ch. 4.
22. Susan Haack, "Epistemological Reflections of an Old Feminist," *Reason Papers* 18 (1993): 31–43 (reprinted, without footnotes, as "Knowledge and Propaganda: Reflections of an Old Feminist," *Partisan Review* 60 [1993]: 556–564); "Science as Social?—Yes and No," in Jack Nelson and Lynn Nelson, eds., *Dialogue on Feminism, Science, and Philosophy of Science* (Netherlands: Kluwer, forthcoming) (page references to manuscript).
23. Haack, "Epistemological Reflections," 35.
24. Haack, "Science as Social?" 9.
25. Haack, "Epistemological Reflections," 38.
26. I am less confident that it accurately represents Haack's views. See Susan Haack, *Evidence and Inquiry* (Oxford: Basil Blackwell, 1993). Haack explicitly endorses premises (1), (2), (3), (5), and (6) [premises (1) and (2): *Evidence and Inquiry*, 199, 203–5; premise (3): ibid., 74, 203–5; premises (5) and (6): "Epistemological Reflections," 35, 42 n. 19]. She seems to think, along with most other defenders of value-neutrality, that (6) is crucial to her case. Premise (6) can play a role in the argument only if something like (4) is accepted. For unless the evidentiary relation can be explicated in logical terms, the lack of any valid logical inference from "ought" to "is" would be irrelevant to the question of whether "ought" claims can provide evidential support for factual claims. But Haack appears to reject the view that logical inference is the basis of evidential relations. She speaks rather of "fitness" between evidence, background information, and conclusions (See "Science as Social?" 4; *Evidence and Inquiry*, 81–84). Haack might reach (8), not via (4)–(7), but through the assumption that value judgments express something like wishes or desires. Then all she needs for (8) is the claim that the wish or desire that *P* provides no evidential support for *P* or for any other proposition. I render the argument using (4)–(7) because this captures the concerns of those who take (6) to be crucial and because Longino also accepts (4). The argument diverges from Haack's views in a second way. Haack speaks in the idiom of epistemology, Longino in the idiom of philosophy of science. To bring their views into contact, I have cast Haack's premises in terms of "theory," where Haack herself talks of "inquiry" in general. The argument works only if theories are construed in the logical empiricist sense, as sets of propositions which have truth-values. Many theorists, including Longino, construe theories as nonlinguistic models that can't have truth-values. See Longino, "The Fate of Knowledge in Social Theories of Science," in Frederick Schmitt, ed., *Socializing Epistemology* (Lanham, Md.: Rowman and Littlefield, 1994), 146–8. This raises the larger issue, beyond the scope of my paper, of whether truth is an aim of theory-building at all. I set aside this issue and focus on whether truth is the only target of theoretical justification, assuming the logical empiricist picture of theories for the sake of argument.
27. See, however, Peter Railton, "Moral Realism," *Philosophical Review* 95 (1986): 163–207. No one argues any more that teleological laws govern the natural world. But some, like Railton, defend the thought that teleological laws might account for human actions—that is, that sometimes the reason why people do things is just because they are right or good or ought to be done.
28. Why do the critics of value-laden inquiry focus so narrowly on the imagined inference from "*P* ought to be the case" to "*P*"? I think the critics obsess over this single possibility because they imagine only one route by which value judgments could ever influence

theory acceptance—via the mechanism of wishful thinking. They therefore overlook the possibility that there could be other routes by which value judgments can influence theory choice.

29. See, for example, Allan Gibbard, *Wise Choices, Apt Feelings* (Cambridge, Mass.: Harvard University Press, 1990).
30. Longino, "Essential Tensions," 260–267.
31. Haack, "Science as Social?" 12.
32. Ibid., 12–13; Haack, "Epistemological Reflections," 35.
33. Haack, "Epistemological Reflections," 36.
34. Historical Research Department, Nation of Islam, *The Secret Relationship between Blacks and Jews* (Chicago: Nation of Islam Press, 1991).
35. Ibid., 23, 20, 28–30, 180.
36. David Brion Davis, "The Slave Trade and the Jews," *The New York Review of Books*, 22 December 1994, 14–16.
37. Ibid.
38. Winthrop Jordon, "Slavery and the Jews," *Atlantic Monthly*, September 1995, 109–112, 114.
39. It follows that one could be justified in believing every sentence of *T* but not justified in accepting *T* as an adequate theory of the phenomenon it purports to be about.
40. The problem is also that the background values presupposed by its inquiry-guiding question are themselves pernicious: They presuppose the legitimacy of blaming ethnic groups for the sins of their ancestors and of ranking whole ethnic groups in a hierarchy of moral worth.
41. Philip Kitcher, *The Advancement of Science* (New York: Oxford University Press, 1993), 95, 112–113.
42. Ibid., 171.
43. For further defense of this view, see John Dupré, *The Disorder of Things* (Cambridge, Mass.: Harvard University Press, 1993). I follow Dupré in arguing that scientific classifications are partly justified by reference to contextual interests.
44. Sharon Cohany, Anne Polivka, and Jennifer Rothgeb, "Revisions in the Current Population Survey Effective January 1994," *Employment and Earnings* 41 (1994): 13–35, 21.
45. Ibid., 17.
46. Anke Ehrhardt and Heino Meyer-Bahlburg, "Effects of Prenatal Sex Hormones on Gender-Related Behavior," *Science* 211 (1981): 1312–1318.
47. Longino, *Science as Social Knowledge*, 131.
48. This conceptual point is, apparently, a subtle one. Paul Gross and Norman Levitt, in their attack on Longino's feminist epistemology, protest that her criticism amounts to a "grossly unfair" ad hominem attack on Ehrhardt and claim to find no sexism in Ehrhardt's "attitudes" (Paul Gross and Norman Levitt, *Higher Superstition: The Academic Left and Its Quarrels with Science* [Baltimore, Md.: Johns Hopkins University Press, 1994], 145–6). Noting that "tomboy" is not a derogatory term, they also accuse Longino of projecting her own "hypersensitivity" toward sexism onto Ehrhardt's research. Of course, the fact that tomboys are not despised for their gender deviance does not make the term "tomboy" innocent of sexist presumptions. Since sexist societies represent "feminine" traits as contemptible (hence the unmistakably pejorative meaning of "sissy," the boy's counterpart to "tomboy"), it is not surprising that they are likely to pass an ambivalent, even half-admiring judgment on girls who renounce "feminine" traits and exemplify the nobler, "masculine" ones. More importantly, Longino's criticism applies to the background assumptions of Ehrhardt's research, not to her attitudes. What could possibly justify a classification scheme that represents some behaviors, exhibited by both sexes, as belonging more properly to one sex than the other? Empirically observed group differences are

simply not sufficient to justify this. African-Americans exhibit considerably lower rates of involvement in higher mathematics and science than whites. But this surely does not justify describing African-Americans who engage in math and science as "acting white." Gross and Levitt exhibit no difficulty recognizing the racism in descriptions like this (ibid., 129), but they fail to recognize the sexist background norms needed to underwrite gender-polarized classifications.

49. Sandra Bem, *The Lenses of Gender* (New Haven: Yale University Press, 1993), 101–127.
50. Ibid., 124.
51. Candace West and Don Zimmerman, "Doing Gender," *Gender and Society* 1 (1987): 125–151; Kay Deaux and Brenda Major, "Putting Gender into Context: An Interactive Model of Gender-Related Behavior," *Psychological Review* 94 (1990): 369–389; Phyllis Rooney, "Methodological Issues in the Construction of Gender as a Meaningful Variable in Scientific Studies of Cognition," *PSA* 2 (1994): 109–119.
52. It is astonishing that Longino's critics have not attended to what Longino actually says about such cases. Haack suggests that between the hypothesis that men's hunting activities caused humans to evolve larger brains and the hypothesis that women's gathering activities did so, Longino holds that, in the absence of conclusive evidence for either side, "we may legitimately choose to believe whatever theory suits our political purposes" (Haack, "Epistemological Reflections," 35). This is what Longino actually says about the relative merits of these two theories: "As long as both frameworks offer coherent and comprehensive accounts of the relevant data, neither can displace the other." The great virtue of the woman-the-gatherer theory is not its truth but "its revelation of the epistemologically arbitrary character of the man-the-hunter framework" (Longino, *Science as Social Knowledge*, 130). Gross and Levitt suggest that Longino infers from the fact that Ehrhardt's hypothesis—that male hormones cause masculine behavior in "tomboys"—is "unacceptable by feminist lights" that the hypothesis must be erroneous or at least less plausible than an environmental, intentionalist explanation (Gross and Levitt, op. cit., 146). In fact, she concludes her review of the evidence for the two theories by saying that "there is no more reason to assimilate so-called gender role behavior to the hormonal model than to assimilate it to [an intentionalist model]" and that "neither theoretical argument can muster constitutively based arguments sufficient to exclude the other" (Longino, *Science as Social Knowledge*, 161). Longino specifically denies that her account of science can "grant to some form of feminism or to any other social or political program an exclusive grant to truth" (Longino, "Essential Tensions," 270).
53. Longino, "Can There Be a Feminist Science?" in Ann Garry and Marilyn Pearsall, eds., *Women, Knowledge, and Reality* (Boston: Unwin Hyman, 1989), 203–216, 211.
54. Gross and Levitt, op. cit., 147.
55. See Toby Jayaratne and Abigail Stewart, "Quantitative and Qualitative Methods in the Social Sciences: Current Feminist Issues and Practical Strategies," in Mary Fonow and Judith Cook, eds., *Beyond Methodology: Feminist Scholarship as Lived Research* (Bloomington: University of Indiana Press, 1991), 85–106.
56. As Longino also stresses, in her own dual-track model of justification. See her "Subjects, Power, and Knowledge," in Linda Alcoff and Elizabeth Potter, eds., *Feminist Epistemologies* (New York: Routledge, 1993), 101–120, 116.