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Keller on Gender, Science, and McClintock:

A Feeling for the Orgasm

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Scientists have an elaborate line of bullshit about how they are seeking to know the truth about nature. . . . Scientists are actually preoccupied with accomplishment. . . . That's the game in science. Even pure scientific discovery is an aggressive, penetrative act. It takes big equipment, and it literally changes the world afterward. Particle accelerators scar the land, . . . [a]stronauts leave trash on the moon. . . . Discovery is always a rape of the natural world.

Michael Crichton[1]

The fair sex has just as much understanding as the male, but it is a *beautiful understanding,* whereas ours should be a *deep understanding*.

Immanuel Kant[2]

Paola was silent for a while, then burst out unexpectedly. "You men are all vain monkeys. You don't enjoy your own orgasm. The only thing you really want is to make a woman go off with a big bang. It had to be men who invented the atomic bomb."

Stephen Vizinczey[2a]

Evelyn Fox Keller has made a name for herself in the gender and science area. Her 1985 book, *Reflections on Gender and Science*, was a provocative, interdisciplinary contribution to the feminist critique of science and led feminist scholars to praise Keller for her exploration of the masculinity of science.[3] Among feminist epistemologists, it is as *de rigueur* to mention Keller as it is, among feminist legal philosophers, to mention Catharine MacKinnon. Keller's "Feminism and Science" is the token feminist piece in a mainstream teaching anthology in the philosophy of science,[4] so her work has been noticed by a wider audience. Keller is, of course, also well known for her biography of Barbara McClintock, *A Feeling for the Organism*.

That sexist assumptions infected the social sciences and the study of human biology had, before Keller, already been established by feminist scholars. But the hard sciences, those farther removed from the study of humans, resisted this type of analysis. Along came Keller: her bold psychoanalysis of science promised to unearth the influence of masculinity at the deepest levels of every science. She "declared that science is 'masculine' not only in the persons of its practitioners, but in its ethos and substance,"[5] and this masculinity, on her view, has been detrimental to science and society. I thus wonder: would a feminine cognitive style have more to contribute to knowledge? Is Kant right about the existence of epistemological gender differences and, if so, does this have implications for science?

This essay is long, so a summary of where I am going will be helpful. I begin (Section I) by presenting Keller's view that science has been destructive because it has been done mostly by men or, more precisely, by men with a certain kind of masculine psychology. Two novel ideas emerge from this observation: that a feminine or women's science would not be humanly or environmentally disastrous and that a feminine or woman's science might even be epistemically superior. I then examine (Section II) a central theme in Keller's early work, her idea that there is a cultural "association" among masculinity, objectivity, and science. Keller, I argue, advances two distinct theses about this "association": first, that popular cultural beliefs tend to link masculinity, objectivity, and the doing of science and, second, that men (but not women) are socialized to be gendered humans in which masculinity is actually linked with a certain sort of objectivity. The latter point leads Keller to propose (Section III) that there are two types of objectivity. One type, an inferior "static" objectivity, is part of masculine psychology and has, unfortunately, been predominantly employed in the sciences. Another type of objectivity, "dynamic" objectivity, is not part of masculine psychology and, according to Keller, is epistemically superior. Barbara McClintock, on Keller's view, achieved success in her scientific investigations because she used a dynamically objective "pursuit." But Keller does not claim that dynamic objectivity is a feminine or woman's form of objectivity. It follows from her account of gender and objectivity that feminine women manifest *no* type of objectivity. Still, Keller thinks that in addition to a dynamically objective approach to the study of nature and a men's/masculine static approach, there is a distinct women's/feminine "love" approach. A tension thus arises in Keller's work: she thinks that dynamic objectivity is superior, but she also praises a pluralistic science in which a masculine, a feminine, and a dynamically objective style are all employed.

In later work, Keller extends her critique of the masculinity of science to the philosophy of realism, which is the intellectual counterpart of men's psychological static objectivity (Section IV). I explicate Keller's arguments against and her alternative to realism, concluding that her proposals are too weakly defended. Further reflection reveals that Keller's rejection of realism rests primarily on social considerations (Section V): she thinks that if masculinist realism in the

foundations of science were abandoned, room would be created in science for a plurality or diversity of approaches, which would include women's values and interests. Keller's claim again raises the question of the superiority of dynamic objectivity. Keller senses the problem, for she eventually denies that the lesson to be learned from McClintock is that science should be carried out by this one approach. Rather, the McClintock case shows us that deviant approaches, a pluralism of approaches inconsistent with masculinity, should be welcomed in and by science for the sake of science itself. I conclude (Section VI) by suggesting that McClintock's science does not represent a deviant approach in any interesting sense, and that in McClintock we find, on Keller's own account, the same masculine psychology Keller had wanted to scrap. McClintock's success thus undermines rather than supports Keller's criticism of masculine science.

I. The Horrors of (Men's) Science

Keller's attitude toward science can be situated within a cranky humanist tradition that is more suspicious than congratulatory. We get a taste of this antipathy in Bertrand Russell, whose *The Scientific Outlook*[6] voiced as early as 1931 many of the concerns that animate Keller in both *Reflections* and its 1992 successor, *Secrets of Life, Secrets of Death*.[7] Criticizing the exploitation of nature brought about by 20th-century science, Russell grieved, sounding like a contemporary advocate of feminine values, that the quest for technological "power has thrust aside all the other impulses that make the complete human life": "love, parenthood, pleasure, and beauty" (*SO*, 152). And he expressed the fear, identical to Keller's -- the Jurassic Park syndrome -- that science was about to unleash havoc onto the world. One of Russell's worries has nearly been confirmed, posthumously, by recombinant DNA vegetables: "The problem of producing synthetic food is purely chemical, and there is no reason to regard it as insoluble. . . . The fields will fall out of cultivation, and agricultural laborers will be replaced by chemical experts." Russell takes this fear to its extreme conclusion, foreseeing the Human Genome Project: "In such a world, no biological processes will be of interest to man except those that take place in himself. . . . [H]e will tend more and more to view himself also as a manufactured product, and to minimize the share of natural growth in the production of human beings" (*SO*, 164). Then, with humans viewing humans as chemical, they "will acquire power to alter themselves" (*SO*,165). At least, we should expect this, if "scientific technique were to rule unchecked" (*SO*, 260), because "the leaders of the modern world are drunk with power: the fact that they can do something that no one previously thought it possible to do is to them a sufficient reason for doing it" (*SO*, 265). Keller, too, thinks that science is driven by the masculine philosophy, "I will climb it because it is there," and she is similarly alarmed that molecular biologists will seize the power to "shape [humanity's] future according to their fantasies of a personal best" (*Sec*., 93).

What has gone wrong with science, according to Russell, is that it changed from being contemplative to being manipulative. The ancient impulse for knowledge was love for the world that sought the "ecstacy" (*SO*, 262) of contemplating it, not the desire for the material benefits that come from manipulating it. We might seek to know an object

because we love the object or because we wish to have power over it. The former impulse leads to the kind of knowledge that is contemplative, the latter to the kind that is practical. In the development of science the power impulse has increasingly prevailed over the love impulse. (*SO*, 261)

Russell again anticipates Keller. In contrasting love-knowledge and power-knowledge, Russell alerts us to the possibility of a superior, feminine, nonaggressive (Kant says "beautiful") way of studying nature. In *Reflections* (125), Keller approvingly quotes a woman scientist, Anna Brito (a pseudonym), as saying, "the best analogy [for doing science] is always love."[8] For Russell, the "impulse of love which gave [science] birth has been . . . thwarted, while the impulse of power . . . has gradually usurped command in virtue of its . . . success. The lover of nature has been baffled, the tyrant over nature has been rewarded" (*SO*, 263).

Keller agrees with Russell that the ancients and the moderns had different notions of knowledge. For Keller, knowledge in Plato is linked with love (and "union"), while in Francis Bacon it is linked with power (*Ref.*, 95).[9] For Plato, the objects of knowledge, the Forms, were conceived of as male, and the love of, or desire for union with, the Forms (that is, knowledge of them) was therefore homoerotic -- since only males were knowers. The material world, being female, did not count for Plato as an appropriate object of knowledge. When, with the rise of materialism, the object of knowledge became the female physical world instead of the Forms, "the meaning of understanding changes. Consistent with the shift from male to female object, the goal of understanding is no longer primarily that of communion but of power; its aim is the domination of nature" (*Ref.*, 30). Men in science attempt to control a female Nature.

Writing in an era that is more sensitive to gender, Keller of course goes beyond Russell. She persistently urges that science has pursued its narrow type of success for reasons having to do with a cultural equation among masculinity, objectivity, and science. We should "take serious notice not only of the fact that science has been produced by a particular subset of the human race -- that is, almost entirely by white, middle-class men -- but also of the fact that it has evolved under the . . . influence of a particular ideal of masculinity" (*Ref.*, 7). Keller ties this "ideal" of masculinity to the exclusion of women and the feminine from science:

With the rise of modern science, knowledge came to be understood as . . . the power to dominate nature. In this history, we can see the construction of gender *as* the construction of exclusion -- of women, of what is labelled feminine. . . . [T]he exclusion of the feminine from science has been historically constitutive of a particular definition of science -- as incontrovertibly objective, universal, impersonal -- and masculine.[10]

For Keller, men's control of science is not the most important cause of the absence of women from science. Politically radical feminists find fault with Keller's more subtle (and for them backwards) cultural and psychological explanation: "The fact that the scientific population is . . . overwhelmingly male, is itself a consequence rather than a cause of the attribution of masculinity to scientific thought" (*Ref*., 76); "perhaps the most important barrier to success for women in science derive[s] from the pervasive belief in the intrinsic masculinity of scientific thought."[11] Our no longer attributing masculinity to scientific thought, were that possible, would permit the inclusion of more women and feminine modes of thought in science.

Russell offers another cause (in addition to its success) for power-knowledge's victory over love-knowledge. Baconian-Lockean-Newtonian science triumphed in revealing the nature of Nature: it exposed that Nature was dead. It did not contain colors, sounds, or tastes, and so was not beautiful. It contained only lifeless corpuscles and hence was "cold and dreadful." "The poor physicists, appalled at the desert that their formulae had revealed, call upon God to give them comfort." But no God dwells in that universe, "and the answer the physicists think they hear to their cry is only the frightened beating of their own hearts" (*SO*, 263). The result of the discovery of the deadness of Nature was disenchantment with a world that could no longer be an object of love. Love-knowledge lost its point and only power-knowledge remained, with this unhappy ending: "Disappointed as the lover of nature, the man of science is becoming its tyrant. . . . Thus science has . . . substituted power-knowledge for love-knowledge, and as this substitution becomes completed science tends . . . to become sadistic" (*SO*, 263). The tale Russell tells is a tragedy. Keller also finds tragedy in the history of science, but for her the banishment of life from Nature was the achievement of recent science. In *Secrets* Keller presents a "subtle (and negative) dimension" of the discovery of Watson and Crick: "it gave rise . . . to an enormously productive era in biology" in which life was reduced to the dead molecules of DNA. The "net result" of this discovery was to "give rise to a world that has been . . . devivified" (*Sec*., 52). Earlier scientists, for Keller, did not so much reveal that Nature was dead as attempt to kill it off, by taking God and spirit out of Nature. But they actually left it to be a mere, passive woman.[12] If Nature is just dead matter, it virtually begs to have its riches exploited by power-knowledge. If we modify this funereal view by asserting that scientists equated Woman with the Nature they no longer found lovable, we arrive at the even more morose thought that men's sadistic domination of women was the model for the exploration (i.e., the exploitation) of Nature, and vice versa.[13]

Both Russell and Keller deny that power-knowledge has been, in a morally robust sense, an unequivocal success. Despite Keller's protest (*Sec*., 2) that readers misread her as attacking science, she entices us into thinking that she doesn't like *men's* science, which is most of it. The damnation of science in *Secrets* is relentless,[14] mostly on the grounds that men's science has yielded the two horrors of nuclear physics and molecular biology. Nuclear physics "solved" the secret of death; a field that men dominate unveiled a monstrously efficient way to destroy everything.[15] Molecular biology, which appears to explore benignly the secret of life, is also an agent of death, reducing living organisms to dead DNA."There is a growing body of literature," Hilde Hein says, "that explains on psychological, metaphysical and/or spiritual grounds why men are fascinated with death and destruction and women find life and creation more gratifying."[16] "Men love death" is what we hear from Andrea Dworkin, who finds that terrifying message to be the meaning of pornography.[17] And from Keller we hear that men love to build and detonate bombs, which is the real meaning of their interest in nuclear physics (see *Sec*., 49-50).

What to do about science? Russell advises, "until men remember the ends that power should subserve, science will not do what it might to minister to the good life" (*SO*, 265). This platitude -- we need to decide carefully what to accomplish with science -- concludes *The Scientific Outlook*. It is also the disappointing finale of one of Keller's essays in *Secrets* (92):

Given our remarkable ingenuity . . . I have no doubt that . . . we could develop representations of natural phenomena adequate to the task of changing the world in different ways -- perhaps . . . giving us solar energy, rather than nuclear power; ecological rather than pathogenic medicine; better rearing rather than better breeding of our offspring. . . . [I]t's time we thought more about what we want.

Keller expresses the optimism that if we opted for the right goals, science would flourish. Given how badly science has been done by white men over the centuries, we should take seriously the idea that a feminine science of ecological medicine and solar power would be a superior science that shines in what it aims at and how it treats nature. Women, with their beautiful understanding, would love and nurture Nature, not only caring for instead of destroying it, but also learning a lot more from and about it. This epistemological/emotional style is much preferable to men's hateful aggression against nature. As Ruth Bleier puts it, "a stronger female tradition in science" might have made science "less alienating and destructive."[18] It would have been, and now can and should be, a science not of Mars but of Venus.[19] "[A] feminist knowledge of the natural world offers an emancipatory rather than an exterminatory science."[20]

II. Gender Trouble

Even though these claims -- science has always been done by men in a masculine way; science infused with loving women might be different or better -- are central pieces of Keller's view of science, a more distinctive and ambitious aspect of her work is her psychoanalysis of the genesis of ideas. In a principal instance of this strategy, Keller contends that in our culture's "collective consciousness" we "associate" science, masculinity, and objectivity (*Sec*., 25).[21] To understand science, we must study "the historically pervasive association between masculine and objective, more specifically between masculine and scientific," associations that are "familiar" and "deeply entrenched" (*Ref*., 75).[22] In Keller's project, our "associations," our mentally tying together these things, are explainable by an object-relations theory of childhood development:

Our early maternal environment . . . leads to the association of female with the pleasures and dangers of merging, and of the male with the comfort and loneliness of separateness.[23]

For all of us -- male and female alike -- our earliest experiences incline us to associate the affective and cognitive posture of objectification with the masculine, while all processes that involve a blurring of the boundary between subject and object tend to be associated with the feminine. (*Ref*., 87)

Keller makes no claim here that men, but not women, *are* "separate" and *do* objectify. Keller's psychoanalytic account of the genesis of our beliefs about gender does not require postulating actual gender differences in psychological make-up. Thus, when Keller says, "to the extent that my analysis rests on the significance of the gender of the primary parent, changing patterns of parenting could be of critical importance" (*Ref*., 93), she means of "critical importance" in changing our beliefs about gender and effecting a "disengagement of our thinking about science from our notions of what is masculine" (*Ref*., 92). If the cultural belief that men, but less so women, are "masculine," i.e., autonomous and objective, is a mere stereotype or an exaggerated bit of gender ideology, Keller's project of explaining psychoanalytically why the belief is widely held is interesting. The *reality* of psychological gender differences has been the territory of other scholars with whom Keller is often identified: Dorothy Dinnerstein, Nancy Chodorow, Carol Gilligan, and Lillian Rubin.[24] Keller, by contrast, claims in her early work that whether there are any psychological gender differences "remains ultimately an empirical question" (*Ref*., 89) that she does not address: "It is important to emphasize that what I have been discussing is a system of *beliefs* about the meaning of masculine and feminine rather than any either intrinsic or actual differences between male and female" (*Ref*., 87). "Keller claims only to explain why culturally science is *seen* as masculine," writes John Chandler.[25]

In more recent writings, Keller continues to make this point. In "Gender and Science: An Update," she says that one of her chief concerns is what "has been accomplished [in science] by the association of gender with virtually all the root categories of modern science" (*Sec*., 20), and she remarks that this question must be "cleansed of any implication about the real abilities of actual women." A 1997 article in *Scientific American* reports that "Keller emphasizes that she is not

suggesting that women in fact think intuitively or that all men are purely rational, only that certain traits have been historically associated with one or the other sex."[26] In a 1993 interview published in *Science*, Keller says, "I'm interested in the ideological equation of masculinity and science and how that equation has shaped the forms, the questions, and the goals of scientific research."[27] Whether men and women have different scientific styles is both "difficult to resolve" and "irrelevant." And Keller avows, in *Science*, that she has never asserted that men and women do science differently: "That mistranslation [of my work] is so insistent, I have really puzzled over it for years."[28] Whether cognitive gender differences differentially equip men and women for science is, according to these passages, not Keller's concern, despite the fact that the science she complains about is gendered: men's science carried out in a masculine way.

The distinction between the study of the genesis of "associations" or beliefs about gender and the study of actual psychological gender differences is as elementary as that between a study of why people believe in God and the question of whether God exists. Keller does not assert an alternative causal explanation according to which people living in our culture *observe* men, more so than women, being manipulative, calculating, aloof (in some ordinary sense autonomous and objective), and being scientists. On the basis of these observations, made in late childhood and beyond, we "associate" men, objectivity, autonomy, and science. This explanation of the genesis of cultural beliefs about gender is a discrete alternative to Keller's; it explains them by referring, somewhere in the causal sequence, to observations of actual gender differences, rather than by an object-relations process, in very early childhood, involving woman-dominated parenting and a relatively absent father. Why bother with Keller's more extravagant psychoanalytic explanation of our "associations" when this simple alternative exists?

Despite her disclaimers, however, Keller often does assert that there *are* cognitive and emotional gender differences. Comments such as

to the extent that boys rest their sexual identity on an opposition to what is both experienced and defined as feminine, the development of their gender identity is likely to accentuate the process of separation (*Ref*., 88)

and

men tend to be especially preoccupied with questions of their autonomy and are considerably more likely than women to seek to support that autonomy through the pursuit of mastery and domination (*Ref*., 106)

indicate that Keller is also developing a psychoanalytic account of the genesis of actual (not merely ideological) psychological gender differences. And when Keller writes that

it seems appropriate to suggest that one possible outcome of these processes is that boys may be more inclined toward excessive and girls toward inadequate delineation: growing into men who have difficulty loving and women who retreat from science (*Ref*., 89)

she is making a (well-hedged) claim about gendered men and women, how we psychologically turn out as a result of childhood development, and the effect this has on the composition and nature of science. Keller implies that women are not as cognitively/emotionally equipped for science, as it is now constituted, as men are.[29] (Men are not as well equipped for love -- as love is now constituted? - as women.) "What . . . are we to make of the fact," Keller asks, "that so much of what is distinctive about [McClintock's] vision and practice -- its emphasis on intuition, feeling, connectedness, and relatedness -- conform so well to our most familiar stereotypes of women? And are, *in fact*, so rare among male scientists?"[30] Keller's comparison entails that the traits women have stereotypically are really, and not simply by ideology, absent from men.

The point is not just that Keller is admitting that there are, after all, psychological gender differences that may be relevant to science.[31] Further, her project of psychologically explaining cultural beliefs about gender becomes less compelling if those beliefs are roughly true. If men *do* exhibit "excessive delineation" (men try to get out of the house, or a relationship, as often or as quickly as they can), then the *prima facie* most plausible explanation of our "association" of masculinity with autonomy is that it is generated by our veridical observations of the behavioral correlates of the excessive delineation of men. On the other hand, if men do not exhibit excessive delineation (they don't desire to leave the house, not even when it's burning), then any belief we have that men are autonomous cannot be based on observations and becomes a prime candidate for being explained psychoanalytically. But, Keller writes, it "seems appropriate to suggest" that boys "may be more inclined" toward autonomy than girls (*Ref*., 89) -- which is why, as grown men, they avoid intimacy with their wives by running off to the laboratory at night and on the weekends, or seek their intimacy in the lab with objects (molecules, mice, moon rocks) that are less threatening to their sense of independence (and less sexually demanding).

We can, however, partially resolve the tension between Keller's bold psychoanalysis of beliefs about gender and her more mundane psychoanalysis of gender, by reading her assertion, that "what I have been discussing is a system of *beliefs* about the meaning of masculine and feminine rather than any either intrinsic or actual differences between male and female" (*Ref*., 87), differently. Keller seems to be stating that she is concerned with the genesis of beliefs about gender and not with the genesis of gender differences. But Keller might be setting up a contrast between, on the one hand, beliefs about gender and, on the other, "intrinsic" differences not between men and women (gender categories) but between males and females (biological, sexual categories). What Keller might be saying is that our cultural beliefs about gender are not true merely in virtue of observations we make of biological differences between males and females. When Keller writes (*Ref*., 88), "I have not been claiming . . . that men are by

nature more objective [or] better suited for scientific work. . . . What I have been discussing are the reasons we might believe such claims to be true," she is warning us that her subject matter is not any biological difference in the cognitive abilities of males and females. In this contrast, however, socialized (but still "actual," even if not "intrinsic") gender differences are missing. Similarly, when Keller writes, "If we reject the position, as . . . we must, that the associations between scientific and masculine are simply 'true' - that they reflect a biological difference between male and female brains -- then how are we to account for our adherence to them?" (*Ref*., 79-80), socialized gender differences are again missing. Trying to ensure that we do not inject biology into her claims about gender,[32] Keller misleadingly implies that there are no "actual" (that is, socialized) psychological gender differences at all. If so, Keller does not mean to rule out the existence of socialized cognitive gender differences that might equip women and men differently for science as it is currently constituted. "Many of the differences between men and women that we think of as consequences of biology are undoubtedly reflections of culture."[33]

But while denying biological explanations for the psychological traits of gendered men and women, Keller underestimates how much biology must be presupposed by a psychoanalytic account of the genesis of behavior *or* ideas. Without appealing to hormones or whole brains, we can still acknowledge, as Freud did, the significance of natural differences in sexual anatomy. The presence of distinct, almost always easily identifiable sexual organs in little males and females prevents them from being treated in exactly the same way by even the best-intentioned parents. There's no need to blame backsliding into old patterns of behavior or woman-dominated parenting. Mothers and fathers, who are gender-socialized but still have biologically sexed bodies, relate differently to their male and female children, who are at first purely sexual, bodily, and nonsocial. Of course, how parents treat their children is influenced by their gender and by gender ideology and is not determined by their own sex or the sex of their children. Nevertheless, not nearly enough is known about the effects of presocial, sexually-charged interactions between parents and children to justify dismissing the sexual.[34] The issue demands serious inquiry. Keller barely raises the question: "gender is a fundamentally relational construct which, although not determined by sex, is never entirely independent of it. In spite of cultural variability and psychological plasticity, it means *something* -- though, for many individuals, perhaps not a great deal -- to identify oneself as being of one sex and not of another."[35] Had Keller ended this sentence at "perhaps not a great deal," her message would have been reasonable: sex plays a role, but not always a big one. It is preposterous that the *identification* of oneself as belonging to a sex, as opposed to *belonging* to it, exhausts the relevance of the sexual. Keller ignores the natural, sexed body, in favor of our popular cultural mental "associations" about it.[36]

III. Searching for Women's Objectivity

Keller, then, does not limit herself to the psychoanalysis of cultural beliefs about gender; she does advance the proposition that gendered men and women are different cognitively and emotionally. This view, variously elaborated, is pivotal to the thesis that women have something special to contribute to the quest for scientific knowledge. They possess skills that have been ignored or devalued throughout the history of science, "resources" that it would be beneficial for science to tap. These might be precisely the psychological traits that have so far kept them out of a science constituted as a man's/masculine domain. But men might also have their own special talents. Which gendered talents are the valuable ones? On the one hand, we might contend that in virtue of socialized cognitive/emotional gender differences, women, or perhaps feminist, scientists are epistemologically privileged knowers superior to men.[37] But once the notion of gender-superiority is acknowledged to be viable, it cannot be denied that men might be the superior knowers -- as suggested by the success of their science. Alternatively, the existence of cognitive/emotional gender differences might be taken to mean that there are separate but equally respectable gendered ways of knowing or doing science.[38]

A similar tension between egalitarian and superioritarian readings of gender differences arises regarding Gilligan's studies of moral development: is men's or a masculine style of moral reasoning (which employs the concepts of rights and justice) merely different from, or better or worse than, women's or a feminine style (caring, responsibility)? Susan Bordo reads Gilligan's *In a Different Voice* as "calling, not for a 'feminization' of knowledge, from which more masculinist modes are excluded, but the recognition that each, cut off from the other, founders on its own particular reefs."[39] In an ideal world, everyone would exhibit a balance of both kinds of moral reasoning. Nel Noddings, by contrast, might be advancing a superioritarian reading of women's morality: "[T]he construction of ethics from the standpoint of women . . . may contribute significantly to . . . general human welfare. Such an ethic has much in common with Christian agape; . . . it emphasizes needs over rights and love over duty."[40]

Similar questions are provoked by Keller's treatment of objectivity. "I define objectivity," she writes, "as the pursuit of a maximally authentic, and hence maximally reliable, understanding of the world" (*Ref.*, 116). Keller proceeds to draw a distinction between two types of objectivity, "static" and "dynamic," which are two kinds of "pursuit":[41]

[A] pursuit is dynamic to the extent that it actively draws on the commonality between mind and nature as a resource for understanding. Dynamic objectivity aims at a form of knowledge that grants to the world around us its independent integrity but does so in a way that remains cognizant of, indeed relies on, our connectivity with that world. In this, dynamic objectivity is not unlike empathy, a form of knowledge of other persons that draws explicitly on the commonality of feelings and experience in order to enrich one's understanding of another in his or her own right. (*Ref.*, 116-17)

Dynamic objectivity "draws on the commonality between mind and nature." The commonality between such disparate things as mind and nature, however, is unclear, and Keller's metaphorical explication -- dynamic objectivity is like empathy, which also draws on commonality -- is nearly empty.[42] The point seems to be that just as we can imagine what other persons feel when in pain, because we have experienced it ourselves, we can imaginatively feel what is going on in nature. But human empathy for other humans is grounded in an obvious commonality, a sort not present between human minds and nature. Perhaps what is key about dynamic objectivity is expressed in the middle sentence: someone who attains dynamic objectivity is both separate from yet attached to the world, or recognizes both the separation and attachment. "Dynamic objectivity is . . . a pursuit of knowledge that makes use of subjective experiences . . . in the interests of a more effective objectivity. Premised on continuity, it recognizes difference between self and other as an opportunity for a deeper and more articulated kinship" (*Ref*., 117). None of this talk seems to yield testable hypotheses about the characteristics of scientists and how, or how well, they do their work. Other things Keller says about dynamic objectivity aren't more helpful. The goal of science, for McClintock, Keller says, is "not the power to manipulate, but empowerment -- the kind of power that . . . simultaneously reflects and affirms our connection to the world" (*Ref*., 166). There is no opportunity here for a social psychological study of the relationship between cognitive/emotional style and scientific success to get off the ground.

Keller continues by describing the other, inferior type of objectivity:

By contrast, I call static objectivity the pursuit of knowledge that begins with the severance of subject from object rather than aiming at the disentanglement of the two. For both static and dynamic objectivity, the ambition appears the same, but the starting assumptions one makes about the nature of the pursuit bear critically on the outcome. (*Ref*., 117)

If one's pursuit of knowledge is static, one begins with the assumption that one is and can be separate from the object of study, and then one carries out, or tries to carry out, that separation sharply, in order to view the object from a detached distance.[43] If one's pursuit is dynamically objective, one gently disengages oneself from the object of study but acknowledges that the disengagement cannot or must not proceed to completion, culminating instead in "connectivity."

Keller's thesis is that static objectivity is masculine objectivity. The sharp separation between knower and known, between investigator and the object of study, results from the "excessive delineation" Keller finds in men's/masculine psychology. Two questions arise here. First, if dynamic objectivity is a superior pursuit of knowledge, while static objectivity is inferior (*Ref*., 84, 126), why has men's science had as much success as it has had? Does Keller mean that science, had it been less masculine and more dynamic, would have been even more successful, not merely in being more concerned with butter than guns, but in making significant discoveries or contributions to our knowledge? The second question is whether Keller thinks that dynamic objectivity is women's or a

feminine analogue to men's static objectivity. Do women, via object-relations processes, exhibit dynamic objectivity to the same extent that men exhibit static objectivity? If the answer is "yes," Keller's praise for dynamic objectivity is praise for a superior women's or feminine epistemological style. So, at the same time that patriarchal institutions have been excluding women from science, women-dominated parenting has been creating women with a knack for the very objectivity required for the best science. If, on the other hand, the answer is "no," Keller is claiming that women, in virtue of early childhood development, come to be neither statically nor dynamically objective. This is a claim strikingly similar, in the context of Gilligan, to Freud's claim that women have no sense of justice.[44]

A "yes" answer is consistent with some of what Keller writes. Dynamic objectivity is "a form of love" (*Ref.*, 117), and we have already noted that Keller speaks of women's scientific style in terms of "love." Similarly, "while some scientists see their endeavor in predominantly adversarial terms, as contests, battles, exercises in domination, others see it as a primarily erotic activity" (*Ref.*, 125).[45] Further, dynamic objectivity looks like the highest "interdependency" stage of women's moral psychology as described by Gilligan, in which women achieve both separation from and attachment to others. And when Keller writes that feminism "seeks to enlarge our understanding of the history, philosophy, and sociology of science through the inclusion not only of women and their actual experiences but also of those domains of human experience that have been relegated to women: namely, the personal, the emotional, and the sexual" (*Ref.*, 9), she seems to defend feminine capacities women have as a result of being gendered. It is thus understandable that Sylvia Walsh reads Keller as "call[ing] for a 'dynamic objectivity' that includes a sense of connectedness to the . . . world, thus redefining objectivity in a feminine manner that downplays (masculine) separation or autonomy,"[46] and that Mary Magada-Ward claims that "Keller wants to construe McClintock's scientific practice as recapitulating at the conceptual level the process of attaining a feminine gendered identity."[47]

But Keller's answer is "no," which fits impeccably with her remarks about the "excessive delineation" of men and women's "inadequate delineation" (*Ref.*, 89). For Keller, "the pursuit of objective knowledge of the world . . . requires the development of the capacity to distinguish self from other" (*Ref.*, 119; see 80). While separation is necessary for *any* objectivity, the separation can go too far or not far enough. Men are objective in the static sense, too sharply separating themselves from the objects of study, as they dramatically separated themselves from their first object, their mother.[48] Women have the opposite disability of not having separated themselves enough: "the girl's development of a sense of separateness may be to some degree hampered by her ongoing identification with her mother" (*Ref.*, 89). In women there can be "too slight an emphasis on separation and difference" (*Ref.*, 107). As Jane Flax says, "Women, in part because of their own history as daughters, have problems with differentiation and the development of a true self."[49] Not clearly disassociating themselves from mother, women remain too close to the world. Hence dynamic objectivity, in

which separation and attachment are properly balanced, is not a superior feminine objectivity, and if women are epistemologically superior to men or have their own special cognitive talents, it is not in virtue of their manifesting dynamic objectivity.

Keller, appropriately, claims that the development of dynamic objectivity is difficult for both men and women. For men there is "a foreclosure of continuity"; for women there is a foreclosure "of differentiation" (*Ref.*, 107). Both men and women are cognitively/emotionally crippled, in the way both men and women, on Bordo's reading of Gilligan, are morally crippled. It follows, on Keller's view, that the piece of gender ideology according to which women are not objective in *any* sense is true. Dynamic objectivity is a way of being just close enough yet just far enough away from the object of study, and hence is the middle ground between men's excessive delineation (static objectivity) and women's failure to achieve enough detachment (not achieving any kind of objectivity). Women have, instead of detachment, an excessive closeness to the object; they have too much love or "feeling for" the organism.[50] About McClintock, Keller says: "She didn't adopt a masculine ideal, nor did she adopt a purely feminine ideal. . . . She made use of the full range of human capacity . . . in the service of science."[51] And Keller asserts that McClintock is "perhaps the most striking exemplar of dynamic objectivity" (*Ref.*, 126). Ergo, dynamic objectivity is not feminine. What is the "purely feminine ideal" that McClintock avoided? The scientist, Anna Brito, cited by Keller as asserting the beneficial role that love plays in women's science, provides a glimpse: "if you really want to understand about a tumor, you've got to *be* a tumor" (*Ref.*, 125).[52] So women's traditional, feminine excessive lack of detachment, their desire to merge with their object of love, has its own special cognitive nature.[53] But we have not been given an argument that extreme closeness to the object of study yields epistemological benefits -- at all, on a par with, or superior to the benefits of masculine detachment. Again, how could a social psychology of science ever begin the project of studying the matter?

Even though dynamic objectivity is apparently ideal and hence should be used by all scientists, Keller also defends a pluralistic study of nature. She applauds the "multiplicity of styles . . . that constitute" science even today (*Ref.*, 125); "a healthy science is one that allows for . . . diverse conceptions of mind and nature, and of correspondingly diverse strategies" (*Ref.*, 178). Keller means this about objectivity itself: "[I]ndividual scientists give widely varying meanings to . . . objectivity, paralleling the wide range of meanings attributable to autonomy. . . . [S]uch differences are essential to the vitality of" science (*Ref.*, 125). We do not want all scientists to use the same cognitive/emotional style in studying nature; we want science done by groups of persons in which all cognitive/emotional styles are abundantly represented. Static, masculine objectivity must exist alongside (androgynous?) dynamic objectivity and the feminine "being the tumor." But advocating pluralism doesn't fit well with Keller's view that dynamic objectivity provides the best way to study nature and her rejection of "the ideology that asserts an opposition between (male) objectivity and (female)

subjectivity and denies the possibility of mediation between the two."[54] Keller's praise for a distinctive "love" feminine cognitive style should, perhaps, not be understood as praise for an approach to nature that is, either by itself or when stirred into the pot, beneficial for science, but (recall Aristophanes' myth) as a longing for the lost connectivity that must be regained to balance men's detachment in forming a new whole that is dynamic objectivity.[55] In the way that Bordo envisions a merging of masculine and feminine moral reasoning in each person, Keller envisions a single superior approach to nature that is neither masculine nor feminine, in which attachment to and separation from the object of study are balanced in each person, not collectively. She anticipates a "transformation of the very categories of male and female, and . . . of mind and nature" (*Ref*., 178).[56]

How is the goal of an integrated and balanced science to be achieved? "A first step . . . would be the undermining of the commitment of scientists to the masculinity of their profession that would be an inevitable concomitant of the participation of large numbers of women" (*Ref*., 175). Women entering the sciences will bring their own style with them, diluting the masculinity of science by packing it with femininity. Because most people are "foreclosed" from being dynamically objective, the corrective to masculine science must be provided, at least now, by women scientists who "love" Nature and try to *be* it. This mechanism is dubious, for, according to a pessimistic Keller, "anyone [women] who aspires to membership in [science] must conform to its existing code" (*Ref*., 173). Keller therefore proposes another mechanism, one based on her psychoanalysis of gender: equal parenting by mothers and fathers would contribute to the transformation of science by subverting both our beliefs about gender and the genesis of gender differences. Keller means, I think, not only that mothers and fathers should spend the same amount of time parenting their children, but also that their *style* of parenting should be the same (see *Ref*., 93*n*7). No wonder that in the idea of "mothering" Keller finds an analogical clue to the proper relationship between science and nature, one that should replace masculine domination:

No one would suggest that a loving parent ought to be content simply to "look," disavowing all attempts to shape and control. At the same time, . . . forms of control that are too rigid or too intrusive are . . . counterproductive. . . . I suggest that the work of "mothering," performed either by mothers or fathers . . . provides a promising metaphor for thinking about alternative relations between scientific knowledge and effective action. (*Sec*., 76)

To overcome "foreclosure," to bring about a wider allotment of dynamic objectivity among the adults that boys and girls become, there is to be only one style of parenting, "mothering," a process from which all children will emerge neither overly delineated nor overly attached, just as there is to be one style of studying nature.[57] We should expect, then, "mothering" scientists to develop ecological medicine and solar power and eschew bombs. But in calling this improved parenting and this better way to study nature "mothering," Keller linguistically implies that a woman's or feminine style is superior. Regardless, the

sexual fly in the ointment persists: there could not be only one style of parenting, and hence only one style of studying nature, if the sexed body has significant effects on parent-child interactions.

IV. Vulgar Anti-Realism

A philosophy of science that Keller calls "classical objectivism" asserts two theses (*Ref*., 141-42). First, nature is "independent of our cognizance." There is an "objective reality" that exists independently of observers. This thesis alleges a "radical dichotomy between subject and object," the same dichotomy Keller finds in masculine static objectivity. Second, nature is "knowable," which Keller unpacks as the claim that there is "a one-to-one correspondence between theory and reality" (see also *Sec*., 73). Keller subjects both theses to psychological analysis; it is here that her psychoanalysis tries to illustrate the working of gender, specifically masculinity, at the deepest philosophical level of science. About the first thesis (and masculine static objectivity), Keller hypothesizes that

> **The severance of subject from object . . . may derive in part from a heavily affect-laden motive for separateness and may serve to buttress a sense of autonomy. If so, then the continuing adherence to the belief in the objectifiability of nature would be assisted by the emotional functions served by this belief. (*Ref*., 148)**

About the second thesis, Keller writes, "the loneliness that others might find in a world in which subject and object are split apart is mitigated, for the scientist, by his special access to the transcendental link" he has to nature, which is the "marriage" between him and nature that, when "consummated," yields a correspondence (or "mirroring") between his theories and his mate (*Ref*., 142). Keller asserts that "classical objectivism" must be "relinquished" (*Ref*., 149), just as masculine static objectivity must be left behind in the transformation of the "very categories" of man and woman, mind and nature.

The essays of *Reflections* scrap masculine objectivity, while the essays of *Secrets* scrap "scientific realism" (her new name for "classical objectivism").[58] The static objectivity of men -- a psychological gender trait -- has an intellectual counterpart in the doctrine of scientific realism. But realism is not merely an intellectual analogue, as if the psychological and the intellectual were mutually independent. Instead, embracing scientific realism is a bit of that same masculine psychology. This is another instance of Keller's psychoanalysis of the genesis of beliefs. In this case the strategy is on firmer ground, for realism, unlike a belief in gender differences, is a philosophical notion that hardly rests straightforwardly on observational evidence. Here Keller examines psychologically a belief that we could take as a Freudian illusion.

But if, as Keller advises, we scrap realism, what would replace it? Answering this question is one of Keller's principal tasks in *Secrets*. The "basic problem" is this:

If . . . scientific realism must be rejected (as I agree it must), and if contemporary analytics take the domain of power, and hence of knowledge, to be the purely social body, then we are left with no way of understanding how it happened that what began as socially constituted dream has been able to insinuate itself into material reality, inducing the objects of a nondiscursive regime to behave as reflections of our own purely discursive regime. . . . [W]e are left entirely unable to account for the material and technological efficacy of . . . science. (*Sec*., 94)

For Keller, scientific propositions are merely parts of "our own purely discursive regime"; they are social products that begin as "dreams"; it is the *power* of the "social body" that determines which dreams are to count as knowledge (see *Sec*., 109). As a result, we are unable to explain science's theoretical and technological success, the fact that the "objects" in the "nondiscursive regime" behave as if our dreams were true.[59] If the "domain of power" establishes the "domain of knowledge," we should never expect science to work, except by coincidence.

The "basic problem" is one that Keller has brought down on herself, for, beyond the psychoanalytic debunking of realism as a piece of masculine psychology, she offers very little anti-realist argument. She could have viewed the reasoning of the "basic problem" as the *reductio* of the claims that theories are dreams and power establishes truth. But Keller prefers not to "retreat" to realism (*Sec*., 95), and lets her rejection of it rest primarily on science's *being socially produced*.[60] In *Secrets* (5), she argues: "Since 'nature' is only accessible to us through representations, and since representations are necessarily structured by language (and hence, by culture), no representation can ever 'correspond' to reality."[61] Power must pick up the slack.[62] Keller then lays out the problem caused by these claims and "dissolves" it:

[S]ome representations are clearly better (more effective) than others. The question that has plagued much recent philosophy of science is how to make sense of this. . . . [T]he difficulty dissolves if we search for the meaning of "better" in a comparison of the uses to which different representations can be put, that is, in the practices they facilitate. . . . *[G]ood science* is science that effectively facilitates the material realization of particular goals, that does in fact enable us to change the world in particular ways. . . . What distinguishes it from other successful institutions . . . is . . . its disciplined interaction with the material constraints . . . supplied by that which, for lack of a better word, I still call "nature." (*Sec*., 5)

Keller feels the pull of realism, and not merely because she lacks a linguistic substitute for "nature."[63] "Good science," for Keller, is that which allows us to change the world in ways we want to change it. But this enriched sense of "better" would seem to explain the success of science only on some realist presupposition. The problem was to explain how there could be good science even in this sense, if scientific theories are dreams that are ultimately made into knowledge by the power of the "social body."

Let us turn, finally, to what is apparently Keller's preferred solution to the problem:

Scientific theories . . . may be thought of as tools; like ordinary tools, they reflect in their very form the agency and intentionality of their makers. In the forms of theory, one can see not only the discourses they embody, but also the structures facilitating their adequacy in meeting the goals for which they have been designed. Good theories are theories that work, . . . [t]hey enable an "us" to act in and on the world in the ways that a "we" deems desirable. As such, they reflect both the subjectivity of human objectives and the objects of human action. And because the forms of human objectives and the objects of their actions are so variable, so too should be the forms of theory available to us, even of theories that "work." In other words, although scientific theories *cannot be understood as faithful reflections of either culture or nature*, perhaps they *can be understood as good enough reflections of the forms of interaction* that . . . social actors seek to implement with that mute but nonetheless responsive world of actors we call nature -- *representing*, in short, neither nature "as it is," nor even some unquestioned and unquestionable notion of instrumentality, *but rather a network* of intentionality, consequentiality, and the relations between them that determine even the meaning of instrumentality. (*Sec*., 95; italics added)

Scientific theories, even those that work, are not "faithful reflections" of nature; nor are they "faithful reflections" of culture (see *Sec*., 36, 94). Instead, scientific theories are "good enough reflections" of "the forms of interaction" between humans and nature, or of "a network of intentionality, consequentiality, and the relations between them." Keller is weaving a course between realism (scientific theories are "faithful reflections" of nature) and relativism (they are only "faithful reflections" of culture), while retaining the ability to understand why science works.[64] Her explanation seems to be: science is successful (despite the fact that it has been done by masculine men using static objectivity?) because even though scientists thought they were mirroring nature, they were willy-nilly representing a "network" among humans, nature, and culture.[65] Now, if scientific theories are "good enough reflections" of something, then realism remains. To say that theories represent a network retains the notion of a correspondence between a linguistic entity and another entity, which Keller told us to abandon.

What does Keller mean by saying that scientific theories are not "faithful reflections" (representations) of either nature or culture? Suppose that scientific theories were fully "socially constituted," were nontrivially the products of society. If so, the stamp or mark of a society would inundate its scientific theories, leaving no room for the mark of nature. A theory that faithfully reflected culture would be a theory from which we could accurately read off the character of the society that gave rise to it: its moral values, gender relations, economic system. The theory would be a crystal-clear image of the society from which it came. Hence, studying science would rival in effectiveness studying society itself for learning about society. (Although there is a paradox: this study of science would itself show nothing but the marks of its social construction.) Similarly, suppose that scientific theories were only the product of the nature they represent, uncontaminated by social or personal hopes and fears; then a scientific theory would be a faithful reflection of nature. Given Keller's anti-realist argument from the social production of science, it can now be asserted that to the extent that the elements of a scientific theory are inevitably influenced by and so even partially

reflect the society that produced it, to that same extent the theory will not faithfully mirror nature. Scientific theories are not faithful reflections of either nature or culture because these reflections interfere with each other, making the pictures supplied of each domain cloudy.[66] (But Keller does think that scientific theories are fairly good reflections of culture: she finds plenty of marks of our culture's gender ideology in science.)

For Keller, "words are far too limited a resource . . . to permit a faithful representation of . . . the vast domain of natural phenomena" (*Sec*., 29). The obstacle to obtaining representations of nature lies in language and in culture. But this anti-realist consideration seems to apply as well to scientific theories understood as representations of an "interaction": if words cannot faithfully represent the "vast domain" of nature, they will surely have difficulty representing the domain that is a network of humans, nature, and culture. Recall Keller's argument that "Since 'nature' is only accessible to us through representations, and since representations are . . . structured by language (and hence, by culture), no representation can ever 'correspond' to reality" (*Sec*., 5). If this consideration demolishes the realistic account of scientific theories, it equally demolishes an account of theories as "reflections" of an "interaction." Indeed, we can also say about Keller's "reflections" in *Reflections*, that because the knowledge she claims to have of the masculinity of science is accessible only through representations, and because representations are structured by language, no representation of the masculinity of science can ever "correspond" to the reality of that phenomenon. Keller's psychological and historical reflections are merely dreams.

But note how favorably Keller speaks of the power of history to establish various things:

[T]he conventional account scientists offer of their success has been *shown* by recent work in the history, philosophy, and sociology of science to be . . . rooted in metaphor. (*Sec*., 29; italics added)

Historians of science have *demonstrated* that the very ideal of pure science is itself a historical construction. (*Sec*., 86; italics added)

It's thrilling to witness the rejuvenation of the humanities. But Keller's history, psychology, and philosophy of science are precisely where she should be most worried about the impact of, the clouding of the mirror by, culture, language, and values. If we have finally buried the "purity" of science, then the purity of everything else, including her own scholarship (and her biography of McClintock), is gone as well. Keller illegitimately assumes that her own philosophico-historical propositions are not mere "dreams" that would have to await the right deployment of power to get them established. ("[E]veryone likes cultural relativism but wants to exempt what concerns him. The physicist wants to save his atoms; the historian, his [or her] events.")[67] She seems not to notice or care that her position generates this vicious self-reference.[68] In a footnote attached to her biographical statement that when she rejected "naive realism" in favor of

"relativism," she temporarily lost interest in questions about the goals of science (*Sec*., 87), Keller writes: "suggesting, perhaps, that neither the history, philosophy, nor sociology of science are any more immune to sociopolitical interest than are the natural sciences themselves." That's backwards. We already had excellent reason for thinking that history, social psychology, and philosophy were incessantly in danger of being infected with language, culture, and values. We expected or hoped that hard-core empirical science would turn out differently. There is something, after all, about history that leaves it especially vulnerable to the social processes that make its assertions mere reflections of culture: history is not experimental. We cannot put its propositions on the rack in trying to eliminate culture. Keller, formally trained in physics and biology, now calls herself a historian and philosopher of science. Has she really ascended, in her life's work and in her own perception of it, from the horribly infected to the merely possibly infected?

V. Let's Get Real

Keller's anti-realist arguments are weak. This suggests that just as Keller psychologically debunks realism, we should debunk her anti-realism. What are the social or psychological origins of her own illusions? Consider how Keller mixes the political and the philosophical:

> **The question of whether scientific knowledge is objective or relative is at least in part a question about the claim of scientists to absolute authority. If there is only one truth, and scientists are privy to it . . . , then the authority of science is unassailable. But if truth is relative, if science is divorced from nature and married instead to culture . . . , then . . . that authority is fatally undermined.**[69]

Rejecting realism, for Keller, undermines the authority of men's or masculine science. Perhaps that is plausible. It is plausible, though, because Keller's manner of rejecting realism -- the domain of knowledge reduces to the domain of power -- undermines the authority of all science. Rejecting realism is dangerous, since pseudoscience of all kinds gains authority. But Keller thinks undermining masculine science is required. There was a time, not long ago, says Keller, when women, because of the cultural equation between science and masculinity, could not be both women and scientists. A woman scientist had to deny having experiences or values that were feminine; she had to be a man. McClintock's "adamant rejection of female stereotypes seems to have been a prerequisite for her becoming a scientist at all" (*Ref*., 173). This "dilemma was unresolvable," for Keller, "as long as the goal of science was seen as the unequivocal mirroring of nature."[70] "[I]f science is . . . assumed to 'mirror' nature, any claim of a disparity between women's creative vision and science as we know it immediately lends itself to being translated into the proposition that women cannot make good scientists."[71] If realism is scrapped, space is created in science for women and their experiences and values, goes the argument. Scrapping realism, then, has one

social or political benefit: we take a step toward greater sexual equality in the cushy positions (for a small, privileged set of women).[72] Relinquishing realist philosophy would aid in the transformation of science, by opening science to more than one truth, for truths other than those of white, middle-class men, in particular the truths of women arrived at through the use of their own cognitive talents. Women can add their own dreams to the social pot of scientific dreams. Keller's argument is not a philosophical refutation of realism, but a prediction of what would happen to the gender constitution of science were realism rejected by its practitioners. The downside of her argument is that this challenge to the authority of science also opens the realm of knowledge, in principle, to astrology and fundamentalist Creationism.[73] We all have a dream we would like socially instituted, if only we could amass the power.

In defending pluralism, Keller says, "To the extent that we acknowledge a multiplicity of goals and standards in science, it becomes possible . . . to argue for the inclusion of difference -- in experience, perceptions, and values -- as intrinsically valuable to the production of science."[74] It *is* possible to make that argument, to the benefit of some women and perhaps to the benefit of science. But where is the evidence that women in particular, with their "being the tumor" style, possess the differences that matter? Are all differences to be included? Why not fundamentalist creationists, with their special theological perceptions and values? This is what is disappointing about Brian Easlea's argument for pluralism: "since logic and experimental evidence do not . . . determine a scientific theory . . . , successful scientific enquiry . . . depends on the contribution of all kinds of scientists."[75] We need some reason for taking the "all kinds" literally, if it is meant that way, and an explanation how the inclusion of all perspectives could be epistemologically helpful, if experimental evidence is all that impotent. And if the "all" is not meant literally, we need a demarcation criterion, one that, say, permits the inclusion of the values of women but not those of astrologers, parapsychologists, and theologically-inspired Creationists.

But I could find in Keller no empirical evidence that either dynamic objectivity or the feminine "being the tumor" (Brito) actually yield scientific benefits. We could, I imagine, test the claim that dynamic objectivity is a more reliable pursuit of knowledge, if we only knew how to identify it. Yet Keller's metaphoric descriptions of dynamic objectivity preclude precise characterization. (Further, in scientifically investigating the promise of dynamic objectivity and the feminine style of "being the tumor," what sort of objectivity should we employ?)[76] Helen Longino also faults Keller in this regard, since she, too, reads Keller as at least sometimes asserting the superiority of dynamic objectivity: "there isn't a general argument to the truth of . . . the epistemological superiority of dynamic objectivity," *beyond* the fact that McClintock used dynamic objectivity (*if* she did) and her scientific studies have been vindicated.[77] Of course, Keller's thesis about dynamic objectivity's providing more reliable knowledge of the world must be replaced, given her later anti-realism, with the claim that dynamic objectivity provides a better picture of the *interaction* or *network* that she takes the subject of

science to be. Indeed, once Keller construes science to represent a network and not nature itself, the ("classical objectivist"!) idea that "dynamic objectivity aims at a form of knowledge that grants to the world around us its independent integrity" (*Ref*., 117) is incoherent.[78] The anti-realist Keller of *Secrets* never asks whether dynamic or static objectivity or, for that matter, Brito's "being the tumor," might achieve an accurate reflection of nature without an interfering reflection of culture, or which one is "good enough" in arriving at representations of the interaction. How could we empirically test whether dynamic objectivity yields a higher "mirror of nature/mirror of culture" ratio than static? We might try arguing *a priori* that very carefully "listening to the organism" and refusing to listen to the interfering noise made by culture would do the trick. That's too easy, and it ignores Keller's notion that culture, through language, limits and colors our knowledge.

Keller in effect replies to Longino's complaint, asserting that what is to be learned from McClintock has been misunderstood: "[T]he *real* point of the McClintock story" is that it "forces our acknowledgement of the existence and value of deviance in science."[79] Keller uses the McClintock example here not to argue for the superiority of dynamic objectivity; instead, she uses the example in an argument for pluralism, that a "healthy" science admits of diverse styles (*Ref*., 178). But the force of the argument depends on interpreting McClintock as deviant enough to be a significant contributor to diversity (see *Ref*., 159). Was she?

VI. The Nobel Superstar

That McClintock was in some interesting sense scientifically deviant is suggested by the language used by Keller and her commentators to describe McClintock: "McClintock, who listened to an ear of corn, let it come to her."[80] For McClintock, "this idea of active dialogue with nature is a very real part of [her] approach to their material."[81] McClintock "repeatedly emphasizes her closeness to her research material and her awareness of every unique detail and subtle change in her organism. . . . She knows -- by . . . a variety of conscious and unconscious observations -- all the details of all her organisms' daily lives."[82]

These descriptions of McClintock, some of which are self-descriptions - "listening" to dumb maize, engaging in "dialogue" with it, noticing (impossibly) "every unique detail" of an ear of corn, observing it "unconsciously" -- do make her appear deviant, but ludicrously. As tossed around by commentators, these phrases are empirically empty, at best fawning metaphors. McClintock's using them in describing her research raises severe doubts about the accuracy of the awareness she has of herself and her methodology. What do these phrases mean? A few years before *Feeling*, Keller gave this explication: "one must have a 'feeling for the organism'. By this [McClintock] means understanding how it

grows, understanding its parts, understanding when something is going wrong with it. A plant, she explains, is not a piece of plastic, but rather is something which grows."[83] A feeling for the organism is, here, spectacularly trivial.

The notion of "listening" to or having a "feeling" for an organism might be made more precise, in at least two ways. But neither establishes McClintock's deviance. First, we could take McClintock's "listening" as *patience*. Her success is to be explained, in part, by saying that she worked *slowly*. She did not exhibit the "impatience" of research bemoaned by Bacon: "the Sphinx was subdued by a lame man with club feet; for men generally proceed too fast and in too great a hurry to the solution of the Sphinx's riddles." "[N]or do I make haste to mow down the moss or the corn in blade, but wait for the harvest in its due season."[84] Keller, albeit with characteristic equivocation, makes this point:

> **For McClintock, the *sine qua non* of good research is a feeling for the organism. . . . Respect for individual differences here invites a form of engagement and understanding not representable in conventional scientific discourse. What might look like privileged insight, and is readily misdescribed as a kind of mystical experience,[85] is . . . a result of close, intimate attention and patient observation.[86]**

The last "and" is misleading. McClintock's "intimate attention" just *is* her patience, or it is nothing at all. McClintock's "engagement," then, is "representable in conventional scientific discourse" after all. As Susan Haack says about McClintock, "Patient, thorough, painstaking observation is . . . admirable; but there is . . . nothing particularly 'feminine' about it."[87] Nor is there anything scientifically deviant about it. So when Genevieve Lloyd writes, "The intellectual virtues involved in being a good . . . scientist are articulated [by Bacon] in terms of the right male attitude to the feminine: chastity, respect, and restraint,"[88] I think of McClintock's experimental virtues. Second, "listening" might be noticing differences and taking them seriously. Nancy Tuana sees McClintock as having been "particularly sensitive to difference," as having refused to "minimiz[e] anomalies."[89] Jane Duran notes that McClintock did not ignore "anomalous" data, even though her scientific training "would have encouraged her" to. Duran's explanation is formulaic: she attributes McClintock's success to her "focused attention," to her "listening to" her organisms.[90] Why not say that the solid sense in which McClintock "listened" to her plants was her being, in spirit, a good Popperian, and admit the obvious, that the training of scientists often encourages them to take aberrant data seriously?[91]

Maybe McClintock was deviant, instead, in the femininity or womanliness of her methodology (but see Section III). Consider what is routinely said by commentators on Keller and McClintock. "The work of great women scientists, such as . . . McClintock, shows us [according to Keller] that an alternative, empathetic, 'feminine' methodology is possible."[92] "Keller . . . has suggested that we might find clues about gynocentric science by examining the work of women scientists like Barbara McClintock."[93] "Keller argues that [McClintock's] style of working can be considered a paradigm of 'feminine' science. . . . It has the

qualities of participation, contextualisation and 'listening' in order to understand."[94] "Keller does not want to equate nobility with being a woman, but she does want to build on the caring and nurturing socialization practices that historically have colored women's lives."[95] "[Harding's] ideal . . . is a degendered science, one which transcends gender in all its forms, not a woman-centred or feminine science, as . . . Keller and other feminists want."[96] These readings of Keller and of Keller on McClintock are egregious errors. As equivocal as Keller is, she abundantly disavows a "femininity" interpretation of both McClintock and her own philosophy of science. For example:

[McClintock's] adamant rejection of female stereotypes seems to have been a prerequisite for her becoming a scientist at all. (*Ref*., 173)

In her adamant rejection of female stereotypes, McClintock poses a challenge to any simple notions of a "feminine" science. Her pursuit of a life in which "the matter of gender drops away" provides us instead with a glimpse of what a "gender-free" science might look like. (*Feeling*, xvii)

[H]owever atypical she is as a woman, what she is *not* is a man. . . . Because she is not a man, in a world of men, her commitment to a gender-free science has been binding. (*Ref*., 174; see *Feeling*, xvii)

[I]t would be tempting . . . to call McClintock's vision of science "a feminist science." Its emphasis on intuition, on feeling, on connection and relatedness, all seem to conform to our most familiar stereotypes of women. . . . [But] McClintock would disclaim . . . any suggestion that her views represent a woman's perspective. . . . [H]er very commitment to science is of a piece with her lifelong wish to transcend gender altogether. (*Ref*., 173)

Proud of her iconoclastic individualism, determined to transcend all stereotypes of her sex, [McClintock] succeeded in fashioning a vision of science that stands in stark contrast to the prevailing vision around her. Her "difference" from her colleagues derived neither from her sex, nor from her female socialization, but precisely from her position as iconoclast and "outsider."[97]

Keller's favored view is that McClintock was not feminine or female in any standard sense. Her methodology was, by her commitment to transcend gender, non-masculine -- but, for Keller (and correctly), "non-masculine" is hardly equivalent to "feminine."[98] If we see McClintock as "not masculine" yet not feminine, a case can still be made that she was deviant. For if she thereby transcended gender, through (androgynous?) dynamic objectivity, she would have achieved, at least in her scientific investigations, what few people (being "foreclosed") are able to achieve anywhere. But that McClintock had a "commitment to a gender-free science" and "wish[ed] to transcend gender altogether" do not entail that she, as a matter of fact, did what she said (in retrospect) she was committed to and wished for. I suggest, that is, that Keller is right that McClintock should not be understood in terms of femininity, but also that McClintock was more masculine -- and hence less scientifically deviant -- than Keller makes her out to be. Of course, to claim that McClintock was a masculine scientist does not fit well with Keller's account of her: "what is distinctive about [McClintock's] vision and practice [is] . . . its emphasis on

intuition, feeling, connectedness, and relatedness."[99] However much this might have been McClintock's "vision," it was not necessarily her "practice."

Consider the similarity between Keller's account of the masculinity of science and her description of McClintock -- a similarity Keller may have been psychologically blocked from seeing. When Keller is elucidating the nature of masculine static autonomy and its effects on the doing of science, she says, studies "report that [scientists] tend overwhelmingly to have been loners as children, to be low in social interests and skills, indeed to avoid interpersonal contact." These studies "suggest a personality profile which seems admirably suited to an occupation seen as . . . masculine."[100] Keller's *Feeling*, ironically, presents a paradigm of one such scientist. "McClintock has lived most of her life alone -- physically, emotionally, and intellectually. . . . Perhaps the word that best describes her stance is 'autonomy.' Autonomy . . . is her trademark" (*Feeling*, 17; see 35). McClintock's psychological autonomy, on the one hand, is laudable, as manifested in her "iconoclastic individualism,"[101] "independence" (*Feeling*, xiv), and attitude toward anomalous data. But, on the other hand, this aloneness, this separateness from other people, was social incompetence, a result of an "excessive delineation" reminiscent of masculine static autonomy. For McClintock's "independence" was inordinate. She was a "recluse" (*Feeling*, xiv). As a child, McClintock had "tomboyish ways" which she "didn't outgrow." She had, when young, "no girlfriends . . . , only boyfriends" (*Feeling*, 24). "I was just not adjusted, never had been, to being closely associated with anybody, even members of my family," said McClintock (*Feeling*, 34). "[E]ven as a child, McClintock neither had nor felt the need of emotional intimacy" (*Feeling*, 205). And, as an adult, she had no close personal relationships. This constitutional aloneness is at the heart of the psychological profile Keller finds to be typical of masculine scientists. It was likely reinforced by McClintock's immersion in science. Brito is blunt: scientific success depends on suspending human relationships. In doing science, "there . . . is no time or space . . . for emotion that paralyzes, for emotion that hurts. No time for ecstasy" in the arms of another.[102] Bacon made the point long ago: "He that hath Wife and Children, hath given hostages to fortune, for they are impediments to great enterprises. . . . Certainly the best works . . . have proceeded from the unmarried or Childless."[103] As Keller pregnantly puts it, "a crucial component of this capacity" for "autonomy, self-determination, and total absorption" was McClintock's "wish to be 'free of the body.' . . . 'The body was something you dragged around,' [McClintock] says" (*Feeling*, 35-36; see 118). But the sexed body cements us to others.

This portrait of McClintock as an asocial loner is unflattering. (A decade after *Feeling*, Keller said in an interview, "McClintock represented everything I was most afraid of -- that becoming a scientist would mean I'd be alone.")[104] It is not a portrait given by commentators on Keller's *Feeling*. Seeing McClintock only as a hero, they report only the schmaltz ("listening," "feeling"). Keller, too, paints a rosy picture. "[T]he intimacy [McClintock] experiences with the objects she studies -- intimacy born of a lifetime of cultivated attentiveness -- is a wellspring

of her powers as a scientist" (*Ref.*, 164). The ultimate source of her scientific powers, its deepest psychological wellspring, however, must have been her masculine detachment. Keller had the material at hand, if she only listened to it, to conclude that McClintock's "intimacy" with her maize was born of a lack of intimacy with humans, of a constitutional, cultivated inattentiveness to people. Keller knows that McClintock was a "recluse," but interprets this trait with sympathy: "In return for the emotional and intellectual energy she invested in [science], such a life provided its own sources of gratification, compensating even for the frustrations of life lived less happily in other spheres" (*Feeling*, 86). McClintock's "'feeling for the organism' . . . has sustained her through a lifetime of lonely endeavor, unrelieved by the solace of human intimacy" (*Feeling*, 198). "Compensation," even if in part right, hardly does justice to the complex and, in Keller's own terms, masculine relationship between McClintock's lack of intimacy with humans and her "intimacy" with maize. For McClintock's intimacy with maize was a way to avoid human relationships, a retreat from the overwhelming difficulty of sustaining them. McClintock found, as men (scientists) do, a less troublesome and less other-demanding intimacy with the objects of her study. When describing her closeness to chromosomes, McClintock says: "I was part of the system. I was right down there with them. . . . As you look at these things, they become part of you. And you forget yourself. The *main thing* about it is you forget yourself" (*Feeling*, 117; italics added). Keller uses this quote to explicate her theme of the intimacy between knower and the known, but she ignores McClintock's "main thing." Forgetting yourself, yes, forgetting your needs for human warmth, suppressing the fact that you are not a balanced human being.[105]

About the chromosomes of her research plants, McClintock says: "I actually felt as if I was right down there and these were my friends" (*Ref.*, 165; *Feeling*, 117).[106] And about her plants, she says, "I know them intimately, and I find it a great pleasure to know them" (*Ref.*, 164). Given McClintock's lack of human relationships, Keller should raise an eyebrow at these honeyed self-descriptions. McClintock's language of friendship with maize and, of all things, chromosomes suggests profound rationalization. On both conceptual and psychological grounds, McClintock's describing her relationship with corn and chromosomes as friendship is suspicious. Plants and chromosomes, unlike dogs, cannot return the affection we show them -- not without our doing some mental dancing: projecting a soul into them, reifying them from object-status to person-status, putting God back into the Nature from which modern science had removed Her. Even Brito, who speaks of "being" a tumor, has no illusions about the status of her objects of study: "You fall in love with a thing."[107] Because McClintock's relationship with corn and chromosomes could not be reciprocal, if it was friendship at all it was a patronizing and paternalistic friendship, a gift from a superior that her lowly maize could not recognize for what it was supposed to be. McClintock is thus not far removed from the "patriarchal husband" that is Keller's Baconian scientist (*Ref.*, 174).[108] I get from Keller -- "[T]he objects of her study have become subjects in their own right; they claim from her a kind of attention that most of us experience only in relation to other persons" (*Feeling*, 200) -- an impression of

McClintock as the limiting case of the cold, absent father (Robin Williams in *Hook*) who spends his life with "things" -- accounts receivable, ontology, corn -- and has no ability to show affection to his children. No deviance here, except that McClintock is biologically female.[109]

"The scientist who claims neutrality is, of course, not apolitical by self-proclamation," observes Anne Fausto-Sterling.[110] Nor is McClintock's methodology gender-neutral (*or anything else*) merely by self-proclamation. Keller asks, "What enabled McClintock to see . . . deeper into the mysteries of genetics than her colleagues?" Keller then says, "Her answer is simple. Over and over again, she tells us one must have the time to look, the patience to 'hear what the material has to say to you,' the openness to 'let it come to you.' Above all, one must have 'a feeling for the organism'" (*Feeling*, 197-98). If McClintock says these empty things *over and over again*, that is reason more for distrusting these banalities than for extracting a methodology of science from them.[111] At once place in *Reflections* (164), Keller relates that McClintock's "vocabulary is consistently a vocabulary of affection, of kinship, of empathy," yet a few lines later Keller inexplicably moves from McClintock's vocabulary to McClintock's psychological reality, referring to "the intimacy she experiences with the objects she studies." Keller the psychoanalyst should be the first to doubt what McClintock *says*, the first to refuse to take McClintock's self-reflections at face value, the first to dig under the confectionary self-descriptions to what is really going on, by listening, not as a mere journalist but as a good analyst, to what is endlessly repeated, mantra-style, and to what is *not* being said, admitted, or broached. Keller once ferociously psychoanalyzed Bacon,[112] but she does not apply her craft to McClintock. Let's do a little of it for her. McClintock's favorite expression "a feeling for the organism" both conceals and exposes her unconscious wish for the feeling of the orgasm, where by "orgasm" I mean that which McClintock's life severely lacked: an appreciation of the sensuality of the body and how it can be shared in ecstatic love with another human being. David Levine's exquisite caricature of McClintock, in which she lovingly holds, if not caresses, a fat phallic ear of maize,[113] perhaps unwittingly exposes her unconscious wish for orgasmic ecstasy and explains why she attached herself to, became fascinated with, corn in the absence of deeply satisfying human relationships. What Keller ignored in theory (sex, the body), McClintock ignored in life.[114]

Notes

1. *Jurassic Park*, 284.

2. *Observations on the Feeling of the Beautiful and Sublime*, 78.

2a. *In Praise of Older Women: The Amorous Recollections of András Vajda* (New York: Ballantine Books, 1967), p. 184. [This epigraph and note were added to, and appear only in, the web site version of this essay.]

3. Keller's *Reflections* "provide[s] one of the most compelling and illuminating of the recent feminist critiques of science" (Sandra Harding, *Whose Science? Whose Knowledge?*, 74); "One of the most exciting feminist contributions to the re-visioning of the epistemological split between reason and emotion in the natural sciences is . . . *Reflections*" (Nancy Tuana, "Re-Presenting the World," 75). At the end of their highly critical review of *Reflections*, Joseph and Judith Agassi concede that Keller's "effort is pioneering" ("Sexism in Science," 522).

4. R. Boyd et al., eds., *Philosophy of Science*. The essay was originally published in *Signs* (1982). References are to Boyd.

5. Londa Schiebinger, *Has Feminism Changed Science?*, 67.

6. *The Scientific Outlook* (hereafter, *SO*). See Timothy Ferris, "The Case Against Science."

7. Hereafter, *Reflections* will often be referred to as "*Ref*." and *Secrets* as "*Sec*."

8. June Goodfield reports this remark of the woman scientist she observed while writing *An Imagined World* (69). Keller grossly truncated the passage when quoting Brito, and so ends up missing or misrepresenting Brito's point. Here's more of it: "[T]he best analogy is always love --making love between conventionally ugly people. The beauty is where no one can see." Brito's point is that science is like love *in the sense* that in science one must be able to see beauty in the object of study, even though it is ugly. See also *An Imagined World*, 228.

9. See also Genevieve Lloyd, "Reason, Science and the Domination of Matter."

10. "The Gender/Science System," 47.

11. "Women Scientists," 84; see also 79 and *Sec*., 23.

12. Keller distinguishes her story from Carolyn Merchant's (e.g., *The Death of Nature*, 195):

Merchant has argued that the central thrust of the scientific revolution was to take woman out of nature, leaving nature as pure machine. . . . [I propose] a slightly different reading. Rather than taking woman out of nature, one might almost say that the real impact of the scientific revolution was . . . to take God out of woman *and* out of material nature. (*Ref*., 54*n*11)

13. As Harding obscurely makes the point: "from [the] very beginning [of modern science], misogynous . . . gender politics and the abstraction we think of as

scientific method have provided resources for each other" (*The Science Question in Feminism*, 116).

14. Given Keller's account of her disheartening experience as a physics graduate student -- her colossal mistreatment by men scientists in virtue of her sex -- it is not implausible that in her career as a philosopher and historian of science Keller has an axe to grind. See her "The Anomaly of a Woman in Physics" and the autobiographical passages in *Secrets* (21-25).

15. For Albert Einstein, men were not altogether to blame. He disavowed being the father of the atomic bomb, and credited Lisë Meitner with being its mother (Mark Smith, "Lise Meitner's Genius," 45). See Mary Morse on the participation of women in The Manhattan Project (*Women Changing Science*, 95-96), and Schiebinger, *Has Feminism Changed Science?*,166-67.

16. "The Feminist Challenge to Science," 9*n*27.

17. "Why So-Called Radical Men Love and Need Pornography," 148.

18. "The Cultural Price of Social Exclusion," 12.

19. Mary Tiles wants a "science which aims more at co-operating with than at conquering Nature, which learns more by conversing or conducting a dialogue with Nature than by putting it on the rack" ("A Science of Mars or Venus?" 293).

20. Hilary Rose, "Hand, Brain, and Heart," 267.

21. In arriving at this idea, Keller was inspired by Georg Simmel (*Ref*., 75); but see her later near repudiation of Simmel (*Sec*., 19). See Schiebinger, *Has Feminism Changed Science?*, 65, 67.

22. Lynn Hankinson Nelson claims that "the association of science with 'masculinity' is very deep" and "Keller's view that the equating of masculinity and science is in the realm of common knowledge is supported by several recent studies" (*Who Knows*, 179). Nelson's evidence is dubious (*Who Knows*, 345*n*141).

23. "Feminism and Science," 283.

24. Respectively: *The Mermaid and the Minotaur*; *The Reproduction of Mothering*; *In A Different Voice*; and *Intimate Strangers*.

25. "Feminism and Epistemology," 374.

26. Sasha Nemecek, "The Furor over Feminist Science," 99.

27. Marcia Barinaga, "Feminists Find Gender Everywhere in Science," 392.

28. Note the title, probably not her idea, of an essay of Keller's reprinted, abridged, in *The Scientist*: "Long Live the Differences between Men and Women Scientists." (The original title was "The Wo/Man Scientist.") Perhaps the headline writer was guilty of a "mistranslation."

29. Harding asserts a similar link between masculinity and science: "the very same personality traits that young males must take on to become masculine . . . are just those that are particularly valued for careers in science. . . . Facility in abstract thought, physical interaction with the environment, and a conception of nature as separate and in need of control -- which parents and the society encourage in male children in order to make them more manly -- are just what prepares young people to like and excel at math, science, and engineering" (*Whose Science?*, 28). Gonzalo Munévar demurs: "I have never seen, or even heard of[,] a society in which facility for abstract thought was . . . considered a sign of manliness. If anything[,] manliness is achieved in spite [of], not because of[,] such facility. Boys who are so intellectually adept tend to be considered nerds, wimps, sissies. When it comes to manliness, facility for abstract thought is barely a notch above taking ballet lessons" ("New Directions, Really?" 348-49). On the "nerd" stereotype of male scientists, see Stephen Brush, "Women in Science and Engineering," 405-406.

30. "Gender/Science System," 42; italics added. (The "in fact" sentence is missing from the end of an identical description of McClintock in *Ref*., 173.) In her post-*Reflections* "How Gender Matters" (176), Keller replaced "intuition" with "intimacy" in the list of McClintock's four properties -- no small difference. The change also occurs in a paper Keller wrote with Jane Flax, "Missing Relations in Psychoanalysis," 340. See n. 85, below.

31. Jane Duran reads Keller as mostly a psychoanalyst of gender differences (*Toward a Feminist Epistemology*, 75-76). Schiebinger juxtaposes Keller's two projects in this passage, without noting the difference: "Keller . . . focuses on the psychological dynamics of family relations as the source of gender distinctions in cognitive skills. Using the psychological theory of object relations, Keller argues that the link in the ideology of modern science between objectivity (a cognitive trait), autonomy (an affective trait), and masculinity (a gender trait) derives from the asymmetries of child care" ("The History and Philosophy of Women in Science," 31).

32. See *Ref*., 79-80; "Gender/Science System," 43; and *Sec*., 20: "[D]espite repeated attempts at clarification, many scientists (especially women scientists) persist in misreading the force that feminists attribute to gender ideology as a force being attributed to sex, that is, to the claim that women, for biological reasons, would do a different kind of science."

33. Keller, "The Bounds of Biology," 39.

34. See Noelle Oxenhandler, "The Eros of Parenthood"; and three essays by Alice Rossi: "Eros and Caritas," "A Biosocial Perspective on Parenting" (17, 29*n*63), and "The Biosocial Side of Parenthood" (75-76). Flax complains about Sara Ruddick's essay "Maternal Thinking" that "sexuality is not discussed as an aspect of maternal practices" (*Disputed Subjects*, 161*n*10). In the Gilliganesque feminism of the caring woman, according to Flax, "Images of maternity are desexualized. The split between sexuality and maternity prevalent in our culture is replicated" (66). In "Remarks on the Sexual Politics of Reason," Ruddick does say: "Mother love . . . is said to be gentle and unconditional when, in fact, it is erotic, inseparable from anger, fierce, and fraught with ambivalence" (246). But Ruddick's point is that actual women, actual mothers, do not always live up to her conception of ideal, sex-less, mothering.

Other feminists are sensitive to sex. Jessica Benjamin, sounding like Freud, writes: "We need not deny the contribution of anatomical reality in shaping . . . femininity; we only have to argue that how biological givens are psychically organized is partly the work of culture, of social arrangements" ("A Desire of One's Own," 84). Harding is more graphic: "Female embodiment is different from male embodiment. Therefore we want to know the implications for social relations and intellectual life of that different embodiment. Menstruation, vaginal penetration, lesbian sexual practices, birthing, nursing, and menopause are bodily experiences men cannot have" ("The Instability of the Analytical Categories of Feminist Theory," 300; see "The Curious Coincidence of Feminine and African Moralities," 307). What Harding relies on in epistemology, Virginia Held relies on in ethics: "There are some experiences . . . open to women and not open to men: menstruating, having an abortion, giving birth, suckling. We need to consider their possible significance . . . for moral experience and theory" (*Feminist Morality*, 80). But Harding would seem not to be able to "know the implications" of women's embodiment, for she thinks that "one cannot distinguish the biological from the social contributions to particular patterns of human belief and behavior" (*Is Science Multicultural?*, 209*n*5; see 210*n*13).

35. "Gender/Science System," 43.

36. A comment in "Gender/Science System" does not improve matters. Keller speaks about "the constraints imposed by the recalcitrance of nature" and those "imposed by the recalcitrance of sex." "In truth . . . neither nature nor sex *can* be named out of existence. Both persist, beyond theory, as humbling reminders of our mortality" (48). To reserve for nature (and sex?) the role of a reminder of our mortality is a terribly thin and implausible admission of its impact. Paul Gross and Norman Levitt make Keller too reasonable: "there are no important differences [for Keller] due to gene action and physiology between men and women, other than in their reproductive systems . . . [or] urogenital anatomy" (*Higher Superstition*, 138). I do not think Keller grants any such power to urogenital or reproductive anatomy or physiology.

37. See Harding, "Feminist Justificatory Strategies," 190; "Ascetic Intellectual Opportunities," 76-77; "The Method Question," 26; "Feminism and Theories of Scientific Knowledge," 10; "'Strong Objectivity'," 341; and "Women's Standpoints on Nature," 186-87. I express doubts about feminist superioritarian philosophy of science in my review of Harding's *Whose Science?*.

38. See my "Feminist Epistemology and Women Scientists."

39. *The Flight to Objectivity*, 130*n*15. Here's Gilligan: "starting from very different points, from the different ideologies of justice and care, the men and women in the study come, in the course of becoming adult, to a greater understanding of both points of view and thus to a greater convergence in judgment"; "the divergence in judgment between the sexes [can be] resolved through the discovery by each of the other's perspective and of the relationship between integrity and care" (*In a Different Voice*, 167, 165). In a later essay, however, Gilligan seems to deny the possibility of convergence: "The analogy to ambiguous figure perception [the duck/rabbit] . . . argues against . . . the implication that these two perspectives are readily integrated or fused" ("Moral Orientation and Moral Development," 30).

40. "Ethics from the Standpoint of Women," 380.

41. Keller explains why she calls objectivity a pursuit: "Properly speaking, 'objective' ought to be an adverb, rather than an adjective, and 'objectivity' a shorthand for an ongoing process rather than a state or condition that has or ever can be reached" ("Feminist Critique of Science," 343).

42. For a thorough discussion of dynamic objectivity as "empathy" or "love," see Sara Worley, "Feminism, Objectivity, and Analytic Philosophy," 147-50.

43. In recounting her experiences as a physics graduate student, Keller declares: "I must tell it objectively -- I must somehow remove myself from the pain of which I write" ("Anomaly," 80). This seems to presuppose some form of static objectivity.

44. "I cannot evade the notion (though I hesitate to give it expression) that for women the level of what is ethically normal is different from what it is in men. Their super-ego is never so inexorable, so impersonal, so independent of its emotional origins as we require it to be in men. Character-traits which critics of every epoch have brought up against women -- that they show less sense of justice than men, that they are less ready to submit to the great exigencies of life, that they are more often influenced in their judgements by feelings of affection or hostility -- all these would be amply accounted for by the modification in the formation of their super-ego which we have inferred above. We must not allow ourselves to be deflected from such conclusions by the denial of feminists, . . . but we shall, of course, willingly agree that the majority of men are also far behind

the masculine ideal" (Freud, "Some Psychical Consequences of the Anatomical Distinction between the Sexes," 257-58). Gilligan, while discussing a short version of this passage, ignores Freud's admission that "the majority" of men, too, fail to achieve the sense of justice "we require" of them (*In a Different Voice*, 7). Indeed, if "justice" is understood in terms of rights and universal rules, then Gilligan *agrees* with Freud: in women's morality there is more of an ethics of care. (See Marcia Westcott, *The Feminist Legacy of Karen Horney*, 141-42.) Note, too, the curious coincidence between Gilligan and Schopenhauer, who was considerably more anti-woman than Freud was supposed to be. "Women," Schopenhauer says, "are inferior to men in point of justice. . . . [C]oncrete things, which lie directly before their eyes, exercise a power which is seldom counteracted to any extent by abstract principles of thought. . . . Hence, it will be found that the fundamental fault of the female character is that it has *no sense of justice*" ("Of Women," 449). Cynthia, a subject in the studies done by Mary Field Belenky and her colleagues, similarly said: "Women see things close at hand and are more concerned with minutiae." Belenky comments: "This feminine mode seemed 'realer, somehow,' to Cynthia. It was a real way of knowing, an embryonic form, perhaps, of the close-up mothering eye that won for Barbara McClintock . . . a Nobel prize" (*Women's Ways of Knowing*, 199).

45. This is why Tuana says that Keller "provides an alternative vision of scientific practice, an image of the relationship between scientists and their material as erotic rather than adversarial, based on love rather than dominance" ("Re-Presenting the World," 75).

46. "Subjectivity Versus Objectivity," 282*n*13.

47. "Rescuing Keller by Abducting Her," 25.

48. See Helen Longino, "Science, Objectivity, and Feminist Values," 563.

49. "Political Philosophy and the Patriarchal Unconscious," 270.

50. See Lorraine Code: "The historical accounts to which I have referred suggest that female knowledge cannot achieve the degree of objectivity male knowledge can achieve. Female knowledge is characterized as more subjective. . . . One might argue that women bring a *richness* of feeling and a *depth* of understanding to cognitive activity" ("Is the Sex of the Knower Epistemologically Significant?" 261; italics added).

51. Barinaga, "Feminists Find Gender Everywhere," 392. Why does Keller say "adopt," as if it were a conscious decision on McClintock's part to combine these styles, rather than a causal result of her biography understood psychoanalytically?

52. In *Ref*. (125), Keller says the tumor passage appears on p. 213 of Goodfield's *An Imagined World*. It is really on p. 226. She makes the same mistake in *Feeling* (207, 219).

53. Keller quotes McClintock: "I actually felt as if . . . these were my friends" (*Ref*., 165; *Feeling*, 117). Friendship implies a balance between distance and closeness, as in dynamic objectivity, not a merging or union, and Keller thinks that McClintock achieved with her plants "intimacy without the annihilation of difference" (*Ref*., 164). If so, Blythe Clinchy wrongly conflates the love-as-union Brito and McClintock ("Connected and Separate Knowing," 221):

In connected knowing, the "it" is transformed into a "thou," and the "I" enters into relationship with the thou. Scientists use this procedure. . . . McClintock says . . . that you must have the patience to hear what the corn "has to say to you" and the openness "to let it come to you" . . . , and the pseudonymous biochemist portrayed by June Goodfield in *An Imagined World* says, "If you really want to understand about a tumor you've got to *be* a tumor."

But McClintock and Brito are worlds apart. *Being* a tumor is not to forge a friendship with it in which you remain the *I* and the tumor remains the *thou*. This is McClintock's purported balancing act of being connected yet remaining separate. (Jane Martin also conflates McClintock and Brito on the first page of her "Science in a Different Style.")

54. Longino politely calls this a "potential contradiction" ("Science, Objectivity, and Feminist Values," 566; *Science as Social Knowledge*, 207).

55. "The feminist critique of science promotes feminine values as an essential aspect of human experience and envisions a science that would integrate all aspects of human experience. . . . The task at hand is to refine the human effort to understand the world by restoring to science a 'lost dimension' -- the feminine -- whose loss has distorted human knowledge" (Schiebinger, "The History and Philosophy of Women in Science," 34).

56. I think Keller means "men" and "women" here, not "male" and "female."

57. Equal parenting might also bring about the merging of Gilligan's two styles of moral reasoning: "Perhaps, with parenting practices that would involve genuinely full sharing between mothers and fathers . . . the moral approaches of men and women would be similar, and the moral theories they would find acceptable would be gender-neutral. Perhaps not" (Held, "Report on Feminist Moral Theory," 12).

58. In *Secrets*, Keller speaks interchangeably of the "realist view" (177), "naive realism" (87), and "classical scientific realism" (94).

59. See also "Feminism and Science," 281; and *Sec*., 9.

60. While praising McClintock's scientific work, Keller showed allegiance to some form of realism: "[H]owever severely communication between science and nature may be impeded by the preconceptions of a particular time, some channels always remain open; and, through them, nature finds a way of reasserting itself" (*Feeling*, 197; see *Ref*., 172).

61. See also *Ref*., 129-31, and *Sec*., 29: "Simple logic . . . suggests that words are far too limited a resource . . . to permit a faithful representation of even our own experience, much less of the vast domain of natural phenomena." So much the worse for the autobiographical claims of Keller's "Anomaly."

62. I once thought so, too. See my "The Political Epistemology of 'Masculine' and 'Feminine'."

63. Elsewhere Keller calls it "residual reality" (*Sec*., 74).

64. Keller wants to "steer clear of the Scylla of 'social relativism' and the Charybdis of 'scientific realism'" ("Feminism and Science," 281).

65. Karen Barad ("Meeting the Universe Halfway") addresses this problem and proposes a solution close to Keller's. Barad never mentions that the task of her 1996-97 paper is Keller's from 1992. She cites only Keller's "Anomaly" and a little of *Reflections*, and ignores *Secrets*.

66. "Science is neither a mirror of nature, nor simply a reflection of culture," says Keller. Instead, "It is the name we give to a set of practices and a body of knowledge delineated by a community -- constrained although certainly not contained by the exigencies of logical proof and experimental verification" ("How Gender Matters," 172-73; see Keller and Flax, "Missing Relations in Psychoanalysis," 336).

67. Allan Bloom, *The Closing of the American Mind*, 203.

68. Keller does write, in one place, "It may not be possible for feminists (or anyone else) to 'tell the truth' about science, any more than it is possible for scientists to 'tell the truth' about nature. Nonetheless, it *is* possible for feminists and other critics to take on the obligation of avoiding 'untruths' about science as best they can" ("Gender/Science System: Response to Kelly Oliver," 152). It's doubtful Keller has met this minimal Popperian obligation. And if her history of science gets off the hook this way, so does science. For what Oliver wrote that

pushed Keller into sensing a self-reference problem, see Oliver's "Keller's Gender/Science System," 144-45, 147*n*5.

69. "Gender/Science System," 45.

70. "Gender/Science System," 40.

71. "Women Scientists," 85.

72. Had these changes occurred sooner, Keller could have remained in physics; see n. 14, above.

73. Longino writes about creation science that "the appeal by its advocates to pluralistic philosophies of science seems misguided, if not disingenuous" (*Science as Social Knowledge*, 79-80). I suppose this applies as well to Keller's pluralism and her attempt to get more women into science by scrapping realism. For an inconclusive discussion of how feminists can "question . . . science as a source of authority" without letting in creationism, see Elizabeth Fee, "Women's Nature and Scientific Objectivity," 15-17.

74. "Wo/Man Scientist," 234; see "Gender/Science System," 46. Her "intrinsically" seems wrong; maybe she means "instrumentally."

75. "The Masculine Image of Science" 138.

76. See my discussion of a similar *petitio* problem in the social scientific study of the relationship between good scholarship and political commitment ("Bad Apples," pp. 377-79).

77. "Subjects, Power, and Knowledge," 108; see also her "Science, Objectivity, and Feminist Values," 566.

78. Worley points out that this problem arises in Keller's writings well before *Secrets*: "There is a clear suggestion here [*Ref.*, 130-31] that science is inescapably culturally influenced . . . , so that we cannot hope to escape culture and get to reality in itself. Given that we cannot hope to get to reality in itself, surely focal attention [dynamic objectivity] cannot be meant as a means for doing so" ("Feminism, Objectivity, and Analytic Philosophy," 151).

79. "How Gender Matters," 174, italics added; see *Ref.*, 159.

80. Ruddick, "Reason's 'Femininity'," 263.

81. Eugenie Gatens-Robinson, "The Dream of a Common Language," 17.

82. Ruth Berman, "From Aristotle's Dualism to Materialist Dialectics," 248, 250.

83. "Feminist Critique of Science," 345.

84. "Sphinx; or Science," Myth 28, *Wisdom of the Ancients* (John Robertson, *The Philosophical Works of Francis Bacon*, 855), and *Novum Organum*, *Works IV*, aphorisms 117, 105. Here is another Baconian theme in McClintock: "Organisms [says McClintock] can do all types of things; they do fantastic things. They do everything that we do, and they do it better, more efficiently, more marvelously" (*Feeling*, 179; see *Ref*., 162). Neither Keller nor Tuana, who displays this passage as a woman's scientific philosophy ("Revaluing Science," 23), notes that the idea had been expressed by Bacon, their patriarchal philosopher of science. Natural phenomena "are such as to elude and mock the imagination and thought of men" (*Cogitata et Visa*, in Benjamin Farrington, *Philosophy of Francis Bacon*, 96).

85. If anyone wants to talk about McClintock as a mystic, they might cite Keller on what "artists and poets, lovers and mystics" (and deviant scientists?) have said about the closeness of the knower and the known (*Feeling*, 118). Rose thinks Keller "emphasis[es] the mystical element in McClintock's approach" ("Beyond Masculinist Realities," 63), as does Ann Koblitz: "What McClintock means by listening to the organism is quite literal -- she is something of a mystic" ("A Historian Looks at Gender and Science," 401). See n. 30, above.

86. "How Gender Matters," 175; see *Feeling*, 197-98.

87. "Science 'From a Feminist Perspective'," 18.

88. "Reason, Science and the Domination of Matter," 51-52.

89. "Revaluing Science," 24.

90. *Philosophies of Science/Feminist Theories*, 46.

91. "McClintock's methodological deviance, her demand to be critically minded, is easy to relate to Popper" (Joseph and Judith Agassi, "Sexism in Science," 521).

92. Haack, "Science 'From a Feminist Perspective'," 17.

93. Ruth Ginzberg, "Uncovering Gynocentric Science," 364.

94. Helen Haste, *The Sexual Metaphor*, 232.

95. Sondra Farganis, "Feminism and the Reconstruction of Social Science," 217.

96. John Chandler, "Androcentric Science?" 318.

97. "Wo/Man Scientist," 317*n*6. See *Ref*. (174): "[A]lthough McClintock is not a total outsider to science, she is equally clearly not an insider."

98. Longino is accurate: "Dynamic objectivity is not presented as a typically feminine epistemological orientation but as an alternative to any epistemological orientation associated with both masculine psychological development and masculinist gender ideology" ("Subjects, Power, and Knowledge," 108). But it is implausible that McClintock is a "feminist scientist," as Longino claims elsewhere ("Cognitive and Non-Cognitive Values in Science," 47). For another case of this misreading, see Martin Curd and J. A. Cover, *Philosophy of Science*, 253.

99. "Gender/Science System," 42.

100. Keller, "Gender and Science," 428-29; *Ref.*, 91.

101. "Wo/Man Scientist," 317*n*6.

102. Goodfield, *An Imagined World*, 152.

103. "Of Marriage and Single Life," in *Bacon's Essays*, 35. Think about Kant.

104. Beth Horning, "Controversial Career of Evelyn Fox Keller," 65. We should therefore add this factor to Keller's speculations about why more women aren't scientists: "Women . . . who had been affiliated with female advisors during their postdoctoral fellowships later left science at a *higher* rate than those who had not (16.7 percent *vs*. 9.7 percent)." One subject "indicated that she was deterred, rather than attracted, by the example of her female advisor in college. '[S]he'd given up all personal life to be a scientist. She had a very lonely and isolated life'" (Gerhard Sonnert and Gerald Holton," Career Patterns of Women and Men in the Sciences," 67).

105. Keller quotes these words of McClintock again in *Reflections* (165), but omits the last sentence about "the main thing." Martin omits the last sentence when quoting the passage in

"Science in a Different Style" (134), reading the passage as merely describing the "fusion" between McClintock and her maize.

106. Michael Mahoney thinks -- he is not being sarcastic -- that "McClintock's felt connection with the chromosomes she was studying was remarkable" ("Connected Knowing in Constructive Psychotherapy," 131-32).

107. Goodfield, *An Imagined World*, 228-29.

108. See my "In Defense of Bacon," 206-208, in Koertge, *A House Built on Sand*.

109. In an interview, Bill Moyers asked Keller, about Margaret Thatcher, "Do you think she's acting like a man?" Keller replied, "She's acting like a traditional,

stereotypic man, yes" (*A World of Ideas*, 79-80). Too bad Moyers didn't ask Keller that question about McClintock.

110. "Review," 782.

111. In her interview with Moyers, Keller says: "It wasn't for my agenda that I chose that title [*Feeling for the Organism*]; the words are hers. It's her deepest belief that you cannot do good research without a feeling for the organism" (*World of Ideas*, 77). All the more reason to psychoanalyze McClintock's language. "In therapy, [Keller] . . . learned to examine her unwitting words and actions for clues to the submerged thought patterns that were helping to determine the course of her life" (Horning, "The Controversial Career of Evelyn Fox Keller," 65).

112. See my "In Defense of Bacon."

113. Levine's drawing is reproduced in Stephen Jay Gould's "Triumph of a Naturalist" (158). I do not mean that McClintock experienced penis envy.

114. This essay is a substantial revision and extension of my "Gender, Objectivity, and Realism," *The Monist* 77:4 (1994), 509-30. I thank Újlaki Gabriella (deceased), Fehér Márta, Norton Nelkin (deceased), Mary Magada-Ward, Susan Haack, Mariam Thalos, and Noretta Koertge.

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