

IN DEFENSE OF BACON*

*In memoriam Thomas D. Perry,
Il miglior fabbro.*

[W]hat a man [or woman] had rather were true he [or she] more readily believes. Therefore he [or she] rejects difficult things from impatience of research. . . .

Bacon, *Novum Organum*, Book I, aphorism 49

Feminist science critics, in particular Sandra Harding, Carolyn Merchant, and Evelyn Fox Keller, claim that misogynous sexual metaphors played an important role in the rise of modern science. The writings of Francis Bacon have been singled out as an especially egregious instance of the use of misogynous metaphors in scientific philosophy. I defend Bacon.

I. SCIENCE AND RAPE

In an article printed in the august pages of *The New York Times*, Sandra Harding (1989) introduced to the paper's readers one of the more shocking ideas to emerge from feminist science studies:

Carolyn Merchant, who wrote a book called "Death of Nature," and Evelyn Keller's collection of papers called "Reflections on Gender & Science" talk about the important role that sexual metaphors played in the development of modern science. They see these notions of dominating mother nature by the good husband scientist. If we put it in the most blatant feminist terms used today, we'd talk about marital rape, the husband as scientist forcing nature to his wishes.

Harding asserts elsewhere, too, that sexual metaphors played an important role in the development of science (e.g., 1986, pp. 112, 113, 116; 1991, pp. 43, 267). But here she understates the point by referring to "marital rape," and so does not convey it in the *most* blatant terms, because her own way of making the point is usually to talk about *rape* and *torture* in the same breath, not mentioning marriage. (I do *not* mean that marital rape is less vicious or more excusable than nonmarital rape. But the connotations of *rape* adjoined to *torture* are stronger than those of *marital rape*.) For example, Harding refers to "the rape and torture metaphors in the writings of Sir Francis Bacon and others (e.g., Machiavelli) enthusiastic about the new scientific method" (1986, p. 113). By associating rape metaphors with science, Harding is trying to accomplish what metaphor itself does; she wants the unsavory connotations of rape to spill over, with full moral condemnation, onto science:

[U]nderstanding nature as a woman indifferent to or even welcoming rape was . . . fundamental to the interpretations of these new conceptions of nature and inquiry. . . . There does . . . appear to be reason to be concerned about the intellectual, moral, and political structures of modern science when we think about how, from its very beginning, misogynous and defensive gender politics and the abstraction we think of as scientific method have provided resources for each other. . . . (1986, pp. 113, 116)

I dare not hazard a guess as to how many people read Harding's article in the *Times*; how many clipped out this scandalous bit of bad publicity for science and put it on the icebox; or how many still have some vague idea tying science to rape. But the belief that vicious sexual metaphors were and are important in science has gained some currency in the academy.¹ This is unfortunate, not only for the reputations of those who engage in or extol science, but also for our understanding of its history.

II. CONTEMPORARY SEXUAL METAPHORS

In *Whose Science? Whose Knowledge? (WS?WK?)*, Harding proposes that we abolish the "sexist and misogynistic metaphors" that have "infused" science and replace them with "positive images of strong, independent women," metaphors based on "womanliness" and "female eroticism woman-designed for women" (1991, pp. 267, 301). Harding defends her proposal by claiming that "the prevalence of such alternative metaphors" would lead to "less partial and distorted descriptions and explanations" and would "foster the growth of knowledge" (1991, p. 267):

If they were to excite people's imaginations in the way that rape, torture, and other misogynistic metaphors have apparently energized generations of male science enthusiasts, there is no doubt that thought would move in new and fruitful directions.

What are the misogynistic metaphors that "energized" science? In a footnote, Harding sends us to Chapter 2 of *WS?WK?*. There we find a section titled "The Sexual Meanings of Nature and Inquiry" (1991, pp. 42-46), which contains *four* examples of metaphors in the writings of two philosophers (Francis Bacon, Paul Feyerabend), one scientist (Richard Feynman), and the unnamed preparers of a booklet published by the National Academy of Sciences.

In the passage from Feynman's Nobel Lecture quoted by Harding, which she interprets as an example of "thinking of mature women as good for nothing but mothering" (1986, p. 112), the physicist reminisces about a particular theory in physics as if it were a woman with whom he long ago fell in love, a woman who has become old, yet had been a good mother and left many children (1986, p. 120; 1991, pp. 43-44). From the *NAS* booklet, Harding quotes: "The laws of nature are not . . . waiting to be plucked like fruit from a tree. They are hidden and unyielding, and the difficulties of grasping them add greatly to the satisfaction of success" (1991, p. 44). Here, says Harding, one can hear "restrained but clear echoes" of sexuality. Perhaps the metaphors used by Feynman and the *NAS* are

sexual, but they are hardly misogynistic or vicious, and I wonder why Harding thought they deserved to be put on display. In fact, Harding only claims that in Bacon, of her four examples, is there a rape metaphor. But let us examine her treatment of Feyerabend first, for there are significant connections between them.

Harding quotes the closing lines of a critique of Kuhn and Lakatos by Feyerabend, who closes his long technical paper with the joke that his view "changes science from a stern and demanding mistress into an attractive and yielding courtesan who tries to anticipate every wish of her lover. Of course, it is up to us to choose either a dragon or a pussy cat for our company. I do not think I need to explain my own preferences" (1970, p. 229).² In *WS?WK?*, Harding exhibits but barely comments on this passage. Her gripe cannot be that Feyerabend (or Feynman, or the *NAS*) employed a *sexual* metaphor, for we know that in *WS?WK?* Harding condones "alternative" sexual images reflecting "female eroticism woman-designed for women." Feyerabend's metaphor--science is a selfish shrew who exploits us *or* she is a prostitute who waits on us hand and foot--must therefore be the *wrong kind* of metaphor, even if not of rape. Harding quotes the same passage in her earlier *The Science Question In Feminism (SQIF)*, giving it as an example of how gender is attributed to scientific inquiry (1986, p. 120). On her view the passage conveys, as does Feynman's, a cultural image of "manliness." Feynman depicts "the good husband and father," while Feyerabend's idea of manliness, says Harding, is "the sexually competitive, locker-room jock" (1986, p. 120). Thus science, in Feyerabend's metaphor, is an accommodating, sexually passive woman, and the scientist and the philosopher of science are the jocks she sexually pleases. I do not see how portraying science as a courtesan implies that the men who visit her, scientists and philosophers, are locker-room jocks. The fancy word "courtesan," if it implies anything at all, vaguely alludes to a debonair and educated Hugh Hefner puffing on his pipe, not to a Terry Bradshaw swatting bare male butt with a wet towel.³

Harding concludes her discussion of Feyerabend by claiming that his metaphor, coming as it does, strategically, at the end of his paper, serves a pernicious purpose. He depicts "science and its theories" as "exploitable women," and the scientist as a masculine, manly man, in order to tell his (male) audience that his philosophical "proposal should be appreciated *because* it replicates gender politics" of the sort they find congenial (1986, p. 121). In *WS?WK?*, Harding similarly asserts that this metaphor was the way Feyerabend "recommended" his view (1991, p. 43). I agree that a woman reading this paper would probably not empathize with the metaphor, even if she fully concurred with the critique of Kuhn that preceded it; but she could, if she wished, ignore it as irrelevant to Feyerabend's arguments. (*Had* Bacon employed rape metaphors, Harding would be right that "it is . . . difficult to imagine women as an enthusiastic audience" [1986, p. 116]. Still, *had* there been any women in Bacon's audience, they could have disregarded his metaphors and accepted, or rejected, the rest on its own merits.) Further, asserting that the men in Feyerabend's audience would be in part persuaded by this appeal, and that Feyerabend thought that he could seduce them

with his "conscientious effort . . . at gender symbolism" (1986, p. 120), is insulting to men. Some men readers undoubtedly prefer strict to submissive women. Would Feyerabend's contrary preference for kittens tend to undermine for them his critique of Kuhn, because it does not match their own taste?

III. HARDING ON BACON

According to Harding, vicious sexual metaphors were infused into modern science at its very beginning, were instrumental in its ascent, and eventually became "a substantive part of science" (1991, p. 44). She thinks Francis Bacon (1561-1626) was crucial in this process.⁴ What Harding says about Feyerabend, that he hoped his view would "be appreciated *because* it replicates gender politics" (1986, p. 121), is what Harding claims about Bacon, although in more extreme terms (1991, p. 43):

Francis Bacon appealed to rape metaphors to persuade his audience that experimental method is a good thing [.]

This is a *damning* criticism. Bacon is not depicted as a negligible Feyerabend making silly jokes about science the old whore. Harding is claiming that Bacon drew an analogy between the experimental method and rape, and tried to get advantage from it (see also 1986, p. 116), as Merchant had claimed before her that Bacon drew an analogy between the experimental method and torture (1980, pp. 168, 172). Conjure up the image: Bacon wants to convince fellow scholars to study nature systematically, by using experimental methods that elicit changes in nature, rather than study nature by accumulating specimens and observing phenomena passively. In order to champion experimentalism, Bacon says to them: think of it as *rape*; think of it as forcing apart with your knees the slender thighs of an unwilling woman, pinning her under the weight of your body as she kicks and screams in your ears, grabbing her poor little jaw roughly with your fist to shut her mouth, and *trying* to thrust your penis into her dry vagina; *that is* what the experimental method is all about.

What did Bacon write to provoke Harding into this accusation? Here is the whole text she offers as evidence for her reading (1991, p. 43):⁵

For you have but to hound nature in her wanderings, and you will be able when you like to lead and drive her afterwards to the same place again. Neither ought a man to make scruple of entering and penetrating into those holes and corners when the inquisition of truth is his whole object.

I *suppose* that a man who made no scruple of penetrating holes (and *corners*?) might be a rapist; but he also might be a proctologist or billiard player. And to "hound" nature *could* be seen as raping her; but the spirited student who storms my office and too often sits down next to me in the cafeteria, hoping for some words of wisdom--no more than that--is *hounding* me. Why could that not be Bacon's point, that a student of nature must be willing to sit plenty on the floor in

the hall, outside her office, waiting for her reluctant nod? It is unlikely, then, that the rape metaphor Harding perceives here is located *entirely* in "hound," unless she has in mind Robin Morgan's definition of rape (1977, pp. 165-66; her italics):

[R]ape exists any time sexual intercourse occurs when it has not been initiated by the woman, out of her own genuine affection and desire. . . . How many millions of times have women had sex "willingly" with men they didn't want to have sex with? . . . How many times have women wished just to sleep instead or read or watch the Late Show? . . . [M]ost of the decently married bedrooms across America are settings for nightly rape.

On Morgan's view, a man who pesters his wife for sex, when she prefers to watch TV, has committed rape if she caves in under his pressure. But Bacon's audience would never have recognized this prosaic sexual phenomenon as rape. Nor would most of us today--reasonable men and women alike--judge it to be rape. We could do so, of course, but that would require many other changes in our moral and legal concepts, probably more than a good Quinean could endure, and would make the accusation, that Bacon traded in rape metaphors, trivial.

Looking at Keller might help us discern a rationale behind Harding's reading of Bacon's *De Augmentis*. In her essay "Baconian Science," Keller quotes the first of the two sentences quoted by Harding, in order to illustrate her own claim that even though, for Bacon, "Nature may be coy," she can still "be conquered":

For you have but to follow and as it were hound nature in her wanderings, and you will be able, when you like, to lead and drive her afterwards to the same place again. (1985, p. 36)

What "leads to [this] conquest," on Keller's view, is "not simple violation, or rape, but forceful and aggressive seduction" (1985, p. 37). Now, that Keller interprets this passage from *De Augmentis* as a rape-free zone does not mean there is no rape image there. So Harding, when reading Keller, might have concluded--with a slight push from Keller, for whom "the distinction between rape and conquest sometimes seems too subtle" (1985, p. 37)--that Keller had been too cautious, that the "conquest" of nature Keller found in "hound" and "drive" together is more accurately described as rape. Harding's rape-interpretation of Bacon, taken as deriving from Keller, would then depend on (1) Keller's being right in finding even the *conquest* of nature in "hound" and "drive," a conquest that must be *sexual*,⁶ and (2) eradicating the difference--also for Bacon, since his *mens rea* is at stake--between rape and seduction. Bacon, of course, recognizes this difference, and advises that science would be more successful by patiently wooing nature than by raping her ("Erichthonius," Myth 20, *Wisdom of the Ancients*; Robertson, p. 843):

Art . . . when it endeavours by much vexing of bodies to force Nature to its will and conquer and subdue her . . . rarely attains the particular end it aims at. . . . [M]en being too intent upon their end . . . struggle with Nature than woo her embraces with due observation and attention.

There is reason to think, then, that Keller was right not to perceive rape in Bacon, although the seduction, here at least, seems considerate and delicate, not "forceful and aggressive."⁷

Something else can be gleaned from Keller. Compare the one sentence Keller took from Bacon's *De Augmentis* with the first sentence that Harding attributes to Bacon. The sentence as quoted by Keller correctly includes the words "follow and as it were" (*Works IV*, 296), which are missing from Harding. I think there is some difference between Bacon's nuanced "follow and as it were hound" nature and the crude "hound" her, which dilution makes a rape metaphor more difficult to discern. I do not want to make much of this error, despite the fact that students of Harding who read only *WS?WK?* will be misguided, because five years earlier, in *SQIF*, Harding quoted this *De Augmentis* passage twice, almost correctly.⁸ Here is one instance:

To say "nature is rapable"--or, in Bacon's words: "For you have but to follow and as it were hound nature in her wanderings, and you will be able when you like to lead and drive her afterward to the same place again. . . . Neither ought a man to make scruple of entering and penetrating into those holes and corners when the inquisition of truth is his whole object"--is to *recommend* that similar benefits can be gained from nature if it is conceptualized and treated like a woman resisting sexual advances. (1986, p. 237; ellipsis and italics are Harding's)

Harding seems not to see "follow and as it were" as a sturdy qualification. But "penetration" need not be taken as having "strong sexual implications" (*contra* Merchant, 1980, p. 168); and even if "penetration" is sexual (was it *for Bacon?*), it does not *per se* entail rape. Perhaps Harding construes the *unscrupulous* (= immoral) penetration of holes to be an allusion to rape.⁹ But this reading makes sense only by wrenching "scruple" out of context. Bacon's point, which he repeats elsewhere, is that any scientist determined to find the truth about nature should be prepared to get his hands dirty; when truth is the goal, *everything* must be investigated, even if to prissy minds the methods employed and the objects studied are foul. (Think about Freud or Kinsey justifying the study of sex.) Thus, a few lines after "scruple" in *De Augmentis*, Bacon bemoans that "it is esteemed a kind of dishonour . . . for learned men to descend to inquiry or meditation upon matters mechanical" (*Works IV*, p. 296; see also *Advancement*, *Works III*, p. 332). Parts of *De Augmentis* (whose title begins *De Dignitate*) and *Novum Organum* were intended to establish the dignity, despite dirty hands, of engaging in science to improve the human condition (see also *Parasceve*, *Works IV*, pp. 257-259). *Novum Organum* is especially clear on this. In one aphorism Bacon condemns "an opinion . . . vain and hurtful; namely, that the dignity of the human mind is impaired by long and close intercourse with experiments" (*Works IV; Book I*, aph. 83;¹⁰ see also *Cogitata et Visa*, in Farrington, 1964, p. 82). Bacon returns to this theme later in *Novum Organum* (120; see also 121):

And for things that are mean or even filthy, . . . such things, no less than the most splendid and costly, must be admitted into natural history. Nor is natural history polluted thereby; for the sun enters the sewer no less than the palace, yet takes no

pollution. . . . For whatever deserves to exist deserves also to be known, for knowledge is the image of existence; and things mean and splendid exist alike. Moreover as from certain putrid substances--musk, for instance, and civet--the sweetest odours are sometimes generated, so too from mean and sordid instances there sometimes emanates excellent light and information. But enough and more than enough of this; such fastidiousness being merely childish and effeminate.

Bacon is, like Calvin, a rascal. He would much rather dissect bugs and chase snakes than play house or have an afternoon tea with Susie.

Bacon's two sentences from *De Augmentis* make yet another appearance in Harding's *SQIF*:

Bacon uses bold sexual imagery to explain key features of the experimental method as the inquisition of nature: "For you have but to follow and as it were hound nature in her wanderings, and you will be able when you like to lead and drive her afterward to the same place again. . . . Neither ought a man to make scruple of entering and penetrating into those holes and cor-ners, when the inquisition of truth is his whole object" . . . [T]his is Bacon's way of explaining the necessity of aggressive and controlled experiments in order to make the results of research replicable! (1986, p. 116; first ellipsis is Harding's)

But it is not obviously true that Bacon, with the phrase "to the same place," is referring to replicability. Nor is Keller's idea obviously correct, that Bacon here asserts that nature can be "conquered." William Leiss suggested, in *The Domination of Nature*, an alternative reading: "having discovered the course leading to the end result, we are able to duplicate the process at will" (1972, p. 59). This reading makes sense, because in the immediately preceding sentence Bacon had written: "from the wonders of nature is the most clear and open passage to the wonders of art," and then by way of explaining or defending this idea, that nature teaches us how to fabricate artificial devices, Bacon now writes "*For* you have but to follow." To learn how to achieve one of nature's effects (to use my own anachronistic example, the overcoming [*conquering*] of bacterial infection), we must study how nature accomplishes it (we *follow* nature by pestering her in the lab); once we discover Nature's Way (the various mechanisms of the immune system) we can then copy, modify, and rearrange its main ingredients (develop "artificial" devices, vaccinations, that elicit antibodies) to "lead" nature "to the same place again." Bacon is modifying a point appearing elsewhere in his writings (e.g., *A Description of the Intellectual Globe, Works V*, p. 507) and that he had made just a page before in *De Augmentis (Works IV*, pp. 294-95):

[T]he artificial does not differ from the natural in form or essence, but only in the efficient. . . . Nor matters it, provided things are put in the way to produce an effect, whether it be done by human means or otherwise. Gold is sometimes refined in the fire and sometimes found pure in the sands, nature having done the work for herself. So also the rainbow is made in the sky out of a dripping cloud; it is also made here below with a jet of water. Still therefore it is nature which governs everything. . . .

In the *Cogitata et Visa*, Bacon goes so far as to say that phenomena found in nature (he praises silk spun by a worm), and from which we can learn, "are such as to elude and mock the imagination and thought of men" (in Farrington, 1964, p. 96). Bacon's example in *De Augmentis* of obtaining a rainbow from a spray of water is serene, even lovely, and makes it improbable that he viewed experimental manipulations as nothing but mere acts of aggression. And Bacon's affirmation that nature "governs everything"--the ways of nature are responsible even for the artificial rainbow we make with a spray of water--is reason to doubt that he conceived of the relationship between science and nature principally as that between man the master and dominated woman. At the very beginning and at the very end of the first book of *Novum Organum*, as well as in "The Plan" of *The Great Instauration (Works IV, p. 32)*--that is, often and in prominent places--Bacon writes that science is "the servant and interpreter of Nature" (*Novum Organum*, 1) and "Nature to be commanded must be obeyed" (3; see also 129).

Harding introduces the *De Augmentis* passage by saying that it contains "bold sexual imagery,"¹¹ but after the quote she escalates the charge: experimentalism, the "testing of hypotheses," is "here formulated by the father of scientific method in clearly sexist metaphors" (1986, p. 116). Harding straightaway takes the next step: "Both nature and inquiry appear conceptualized in ways modeled on rape and torture--on men's most violent and misogynous relationships to women--and this modeling is advanced as a reason to value science" (1986, p. 116). Of course, if the passage contains no rape metaphor, Harding's thesis (see also 1986, p. 237; 1991, p. 43) that Bacon employed a rape metaphor to recommend experimentalism falls apart. But even if the passage contains a rape metaphor, why think that Bacon used it to promote experimentalism? Examine the two sentences Harding quotes from the 1623 *De Augmentis*, as they appeared in the 1605 English predecessor of this text, *The Advancement of Learning (Works III, p. 331)*:

for it is no more but by following and as it were hounding Nature in her wanderings, to be able to lead her afterwards to the same place again. . . . Neither ought a man to make scruple of entering into these things for inquisition of truth. . . .

The three purported offenders, "drive," "penetrate," and "holes," are missing. Which of these texts was more momentous for Bacon's program? In *Advancement*, written soon after the accession of James I, Bacon was surely trying to win over his king; when writing *De Augmentis*, the older Bacon had already been stripped of his official positions, and was writing for posterity. In which situation should we expect Bacon to use harsh (or soft) language to do the persuading? This is treacherous terrain; at least, the contrast between the *Advancement* and *De Augmentis* should give us pause.

Furthermore, in *Novum Organum* (and elsewhere) Bacon argues on behalf of science in terms more likely to convince his audience: it will improve the human condition (81, 129; see *De Augmentis, Works IV, p. 297*), and so the works of science are works of love (*Valerius Terminus, Works III, pp. 221-22*; "Preface" to

The Great Instauration, Works IV, p. 21; see Farrington, 1964, pp. 28-29). And at the end of the first book of *Novum Organum* (129), Bacon reminds his audience that science fulfills the Biblical command (*Gen 1:26*) for humans to rule the universe (see Leiss, 1972, p. 53). These themes in Bacon are typical and familiar.¹² Why conjecture that Bacon also appealed to a rape metaphor, as if that were the icing on the cake of his vindication of science? Perhaps Harding assumes that from the fact that the text contains a rape metaphor, it follows that the metaphor must have been used to convince the audience to embrace his philosophy. It would be a mistake to conclude, however, solely from the presence of a rape metaphor, that it was intended to have a specific perlocutionary force. This mistake is similar to one made about *erotica*, namely, arguing solely from the presence in a text of a photographic or linguistic depiction of a certain sexual act, that the text recommends or endorses the depicted act.¹³ My mentioning *erotica* here is not inappropriate. Harding titles the section of *SQIF* in which she first quotes Bacon "Should The History And Philosophy Of Science Be X-Rated?" "This question is only slightly antic," because (previewing her comments on Bacon and Feyerabend) "we will see assumptions that . . . the best scientific activity and philosophical thinking about science are to be modeled on men's most misogynous relationships to women" (1986, p. 112). That is, Harding thinks that science, its history and philosophy, *should* be rated "x"; it contains, on her view, explicit and nasty sex. But I cannot perceive, as she does, the sexually aggressive locker-room jock in Feyerabend's metaphor, nor can I perceive, as she does, the rape metaphor in Bacon. So perhaps it is Harding's story itself that should be rated "x": *she* injects sex where there is none to begin with. Consider the *NAS* metaphor: the laws of nature are "not waiting to be plucked like fruit from a tree [but] are hidden and unyielding." Harding finds here a "clear echo" of sexuality (1991, p. 44). But these few words can be read, without effort, as innocent and nonsexual; so it is Harding, like the person who feels squeamish at the sight of uncovered piano legs, who has infused the sex into them. Further, if Harding's own psychology is uncommonly sensitive to the nuances of language and so enables her to extract a rape metaphor out of "hound" and "holes," or if the metaphor is one that mostly or only women could sense, that would undermine Harding's claim that Bacon used a rape metaphor to persuade his audience.¹⁴

One more example: Bacon's portrayal of inquiry as a "disclosing of the secrets of nature" (*Works IV*, p. 296; see *Novum Organum*, 18, 89). We *could* construe the language of discovering, or uncovering, the hidden secrets of nature as alluding to a quest for carnal knowledge of a deeply concealed female sexuality that is not keen on being exposed (for whatever reason, be it prudish modesty, girlish self-doubt, lazy reluctance). We might interpret such language this way in order to suggest that this was the deeper, hidden, meaning of the philosophical claim that underneath the appearances of things and events are unobservable structures and forces about which we can have no direct knowledge and about which we will remain ignorant unless we diligently investigate, experimentally, their phenomenal manifestations. But the sexual metaphor, if we insist on digging it

out, is tame; there is no rape, and no need to compel or twist the metaphor, against its will, to *be* rape.

IV. MERCHANT ON BACON

According to Harding, rape is Bacon's metaphor for the experimental method; for the historian Carolyn Merchant (1980, p. 172), "the interrogation of witches" by torture is Bacon's "symbol for the interrogation of nature":

Much of the imagery he used in delineating his new scientific objectives and methods . . . treats nature as a female to be tortured through mechanical interventions [and] . . . strongly suggests the interrogations of the witch trials and the mechanical devices used to torture witches. In a relevant passage, Bacon stated that the method by which nature's secrets might be discovered consisted in investigating the secrets of witchcraft by inquisition, referring to the example of James I. (1980, p. 168)

In which "relevant" passage does Bacon "state" such a thing? Merchant calls on *De Augmentis* (*Works IV*, p. 296) to substantiate her assertion:

For you have but to follow and as it were hound nature in her wanderings, and you will be able when you like to lead and drive her afterward to the same place again. Neither am I of opinion in this history of marvels, that superstitious narratives of sorceries, witchcrafts, charms, dreams, divinations, and the like, where there is an assurance and clear evidence of the fact, should be altogether excluded. . . . howsoever the use and practice of such arts is to be condemned, yet from the speculation and consideration of them . . . a useful light may be gained, not only for a true judgment of the offenses of persons charged with such practices, but likewise for the further disclosing of the secrets of nature. Neither ought a man to make scruple of entering and penetrating into these holes and corners, when the inquisition of truth is his whole object--as your Majesty has shown in your own example. (1980, p. 168; ellipses and italics are Merchant's)¹⁵

I do not perceive the torture metaphor. The two sentences Merchant italicizes (the two in which Harding finds rape) do not, if my arguments in *Section III* are sound, bear that interpretation; nor do the sentences that fall between.

Nowhere does Bacon *state* what Merchant says he states. In referring to James in this passage, Bacon is not, *contra* Merchant, alluding to his methods of inquisition, but pointing out that James was willing to get his hands dirty (by studying witchcraft). What James "show[ed] in [his] own example," says Bacon, is that everything in nature is an appropriate object for scientific study (one of Bacon's principles, recall), not that science should torture nature as if a witch. The text provides no reason to think that "Bacon's recommendation that experimental method should characterize the new science was couched in terms of the method James I had successfully used to 'expose' witches" (Nelson, 1990, p. 353 n. 137). Further, note that by 1622, when *De Augmentis* was being written, James had already changed his mind about witches and had intervened to save some of the accused from execution.¹⁶ Thus Bacon could not have been appealing here to a beloved pastime of James in devising a metaphor for experimentalism. Bacon

might have had better luck appealing to a torture-the-witch metaphor in the 1605 *Advancement*, right after James's Statute of 1604; but, as I have pointed out, the language of that version of *De Augmentis* is not very provocative.

If we reinsert into this passage from *De Augmentis* the words Merchant deleted (indicated by italics), we can more clearly appreciate Bacon's point: "Neither am I of opinion in this history of marvels, that superstitious narratives of sorceries, witchcrafts, charms, dreams, divinations, and the like, where there is an assurance and clear evidence of the fact, should be altogether excluded. *For it is not yet known in what cases, and how far, effects attributed to superstition participate of natural causes; and therefore* howsoever the use and practice of such arts is to be condemned, yet from the speculation and consideration of them *(if they be diligently unravelled)* a useful light may be gained, not only for a true judgment of the offenses of persons charged with such practices, but likewise for the further disclosing of the secrets of nature."

Bacon is not recommending that witches or nature be tortured; instead, he is telling his audience to pay attention to the distinction between the context of discovery and the context of justification: regardless of the source or origin of certain claims ("narratives"), their content might very well be true, and this can be known only by investigating them scientifically. This is what Harding calls the "desirable legacy" of modern philosophy of science, the notion that "we should be able to decide the validity of a knowledge claim apart from who speaks it" (1991, p. 269).

This passage from *De Augmentis* was the first and longest quoted by Merchant in making her case; it was her best shot, and it missed the mark. There are, of course, other passages, mostly scattered words and partial sentences, that Merchant quotes in rounding out her argument. I cannot deal with them all. But there is a frequent reference to Proteus in Bacon's works that deserves discussion. Introducing one of them, Merchant claims that Bacon drew an analogy between the "inquisition" of nature and "the torture chamber" (1980, p. 169). Here are his words (*De Augmentis, Works IV*, p. 298; see also *Advancement, Works III*, p. 333):

For like as a man's disposition is never well known or proved till he be crossed, nor Proteus ever changed shapes till he was *straitened and held fast*; so nature exhibits herself more clearly under the *trials and vexations* of art than when left to herself. (Merchant's italics)

I agree that force is here applied to Proteus, in particular. But if we take seriously Bacon's analogy between nature and Proteus, the implication is that we must be smart enough to *outfox* and corner nature in order to get a hearing for our questions. And then, as we are trying to hold fast to nature, nature will almost always escape, by changing unpredictably and uncontrollably, slithering or leaping away or disappearing as a gas, and we will not get an answer. Thus our attempts to bind her will be largely *fruitless*. The Proteus image, then, is a tribute

to the sagacity and subtlety of nature (see *Novum Organum*, 10, 24). Now, if we do not take the analogy literally, we can be content with the core of Bacon's idea, which has nothing to do with torture: a person left alone might never expose the greed (or love) that lies deeply buried in her heart; but if she is tempted by a stuffed wallet on the ground (or moved by the televised sight of the faces of starving children), she might respond, revealing those secret parts of her character.

Merchant quotes another Proteus passage (1980, p. 171); perhaps it will be thought that this one more strongly supports her reading:

[T]he vexations of art are certainly as the bonds and handcuffs of Proteus, which betray the ultimate struggles and efforts of matter. (*Parasceve, Works IV*, p. 257)

"Bonds and handcuffs" look damning when equated with "vexations of art" (i.e., experimental techniques. But we know that these devices are being applied to Proteus, the supreme Houdini, in which case we need not be so anxious about his safety. What does Bacon mean by the less than transparent "betray the ultimate struggles and efforts of matter"? In the very next sentence (not quoted by Merchant), Bacon explains: "For bodies will not be destroyed or annihilated; rather than that they will turn themselves into various forms." Here Proteus stands for *matter*; so, no matter how much we bind matter, says Bacon, it is indestructible. Bacon is not issuing a *normative* claim, as if urging us to bind matter to prevent it from behaving perversely (Merchant's reading, p. 171; see also Bordo, 1987, p. 109); he is making the *ontological* point that no amount of binding will allow us to annihilate matter. Bacon states the idea quite nicely in *Wisdom of the Ancients* ("Proteus," Myth 13; Robertson, p. 838):

if any skilful Servant of Nature shall bring force to bear on matter, and shall vex it and drive it to extremities as if with the purpose of reducing it to nothing, then will matter (since annihilation or true destruction is not possible except by the omnipotence of God) finding itself in these straits, turn and transform itself into strange shapes, passing from one change to another till it has gone through the whole circle.

--just as Proteus in the *Odyssey* (*Book IV*), at the hands of Menelaus and his crew, goes through the whole cycle and is never destroyed. Note that Bacon speaks here again of the scientist as "servant of nature." Also note that in his mind there is some distinction between nature and matter--so that to "vex" matter is not necessarily to vex nature.¹⁷

Let us, then, look at another feature of some of these passages, Bacon's frequent use of "vex" and its congeners. Merchant (above) italicized "vexations" in *De Augmentis*, and both Leiss (1972, pp. 59, 138) and Keller (1985, p. 36) highlight "vex" as conveying sexual aggression. Even though Bacon's use of "vex" is occasionally strong (e.g., in relation to imperishable matter, in *Thoughts on the Nature of Things, Works V*, pp. 427-28), I am not convinced that "vex" in Bacon always or usually carries a noxious connotation; I tend to think of "vex" along the

lines of Bacon's "hound" and my "pester." For example, in *Novum Organum* (98; see also a variant of these lines in "The Plan" of *The Great Instauration, Works IV*, p. 29, which is the "vex" passage Keller calls attention to) Bacon writes:

For even as in the business of life a man's disposition and the secret workings of his mind and affections are better discovered when he is in trouble than at other times; so likewise the secrets of nature reveal themselves more readily under the vexations of art than when they go their own way.

This mature and polished statement of his philosophy contains no rape, no torture, no bondage, just the thought that to know nature it is not enough to watch her; she must be provoked into showing us her inner workings. I find nothing to complain about in this thought, especially when I consider how much of my knowledge of human nature I never would have acquired had not my family, friends, and colleagues, let alone myself, been crossed and thereby goaded into exposing features of our personalities we do not ordinarily broadcast.

V. KELLER ON BACON

In order to make the case that Bacon deliberately used rape or torture metaphors to persuade his audience of the virtues of experimental science, the metaphors (1) should clearly be in his texts, (2) should be located in vital places, (3a) should appear in several passages yet (3b) not indiscriminately, and (4) should not have their thrust diluted by other contrasting images. If Feyerabend had likened not only science but also such disparate things as television, poetry, and champagne to a kitten, or if at one point he called science a kitten but elsewhere a stern mistress, we would not be inclined to take his metaphors seriously. Similarly, to the extent that Bacon applied his images to a wide assortment of items, or used diverse, even contradictory, metaphors, it would be implausible to claim that he appealed to them to do the *important* job of vindicating his science.

Evelyn Fox Keller's work on Bacon is for this reason important. Her key idea is that Bacon's sexual imagery involves a more "complex sexual dialectic" than usually recognized (1980, p. 302; 1985, p. 35); in Bacon's language the scientist both aggressively dominates and is "subservient" and "responsive" to nature (1985, pp. 36-37). Thus her title, "Baconian Science: The Arts of Mastery and Obedience" (1985, p. 33): science is both master of and obedient to nature. Keller's essay is in effect a reply to Leiss, who says about Bacon's "famous formula"--we command nature by obeying her--that "some commentators have claimed that it sounds a note of humility in man's attitude toward nature. But this interpretation . . . invents inconsistencies which do not really exist in Bacon's work" (1972, pp. 58-59). I think Keller is right to find inconsistency in Bacon's metaphors, but wrong in what she makes of it.

In arguing for one side of the inconsistency, that Baconian science is "aggressive" in its "conquest" of nature, Keller assembles together seven passages (1985, p. 36). The first is from Bacon's *Refutation of Philosophies*: "Let us establish a

chaste and lawful marriage between Mind and Nature."¹⁸ The metaphor looks benign, as does that of a "chaste, holy and legal wedlock" (the second passage, from *The Masculine Birth of Time*, in Farrington, 1964, p. 72), but Keller thinks of marital imagery in Bacon as aggressive (1985, p. 19). There is no need to. Bacon uses marriage imagery promiscuously in his writings, with no hint of aggression; see "Preface" to *The Great Instauration*, in which Bacon speaks about the "true and lawful marriage" he is attempting to effect "between the empirical and the rational faculty" (*Works IV*, p. 19), and *Novum Organum*, in which Bacon criticizes those who would "deduce" Christianity from the principles of philosophy, thereby "pompously solemnising this union of sense and faith as a lawful marriage" (89). And in the marriage passages quoted by Keller, there is no intimation of aggression at all; Bacon immediately proceeds to say (typical for him; e.g., "The Plan" of *The Great Instauration*, *Works IV*, p. 27) that the marriage will issue in "wholesome and useful inventions . . . to bring relief" from "human necessities" (*Refutation*, in Farrington, 1964, p. 131) and "will overcome the immeasurable . . . poverty of the human race" (*Masculine Birth*, in Farrington, 1964, p. 72). Still, for Keller, the marital image in Bacon "constitutes an invitation to the 'domination of nature'" (1978, p. 429, n. 5; 1985, p. 91, n. 6), because it "sets the scientific project squarely in the midst of our unmistakably patriarchal tradition" (1978, p. 423) in which the wife is under the thumb of the husband. Hence, when Bacon writes in *Masculine Birth* (the third passage), "I am come in very truth leading to you Nature with all her children to bind her to your service and make her your slave" (1985, p. 36; see also p. 48; in Farrington, 1966, p. 62), Keller sees a wedding announcement in which nature is fingered as the bride; she is a slave, since that will be her married lot. The image here of binding nature as a slave is an ugly one.¹⁹

Keller cites four additional passages in her account of the aggression toward nature in Bacon's images. In one, from the "Preface" to *Novum Organum*, Bacon writes of trying to "penetrate further" and "find a way at length into her inner chambers" (*Works IV*, p. 42), which is hardly pushy. Keller then turns to the *De Augmentis* "hound . . . and drive" passage I have already examined, which (*contra* Keller) contains no conquest, sexual or otherwise. Keller also refers to Bacon's theme (also discussed above) that more can be learned about nature by *vexing* her than by observing her in freedom.

The remaining lines cited by Keller are from *Cogitata et Visa* (1607; published 1653; Farrington, 1964, p. 57). Bacon says, about--according to Keller--"the discipline of scientific knowledge, and the mechanical inventions it leads to" (1985, p. 36), that they do not "merely exert a gentle guidance over nature's course; they have the power to conquer and subdue her, to shake her to her foundations."²⁰ Apparently, this is crude aggression. [Note added, June 2002: Oh? Read Mark Twain's *The Adventures of Tom Sawyer*: "the convulsion of delight that swept [Tom's] system shook him to his foundations" (London: Puffin Books, 1994, p. 28.) But our judgment of Bacon will be improved by realizing three things. First, Bacon is in part referring here not to mechanical devices in general

but to "Printing, Gunpowder, and the Nautical Needle," which he thinks had more effect on "human affairs" than any "empire," "school," or "star" (in Farrington, 1964, p. 93). Bacon expresses his point hyperbolically--that these exemplary inventions are the kind of thing that can conquer and shake nature to her foundations--but given his point, the sentence is a prime candidate for being read generously. Second, *Cogitata et Visa* is a polished work, even though unpublished during Bacon's life, and, except for this one line, tranquil throughout. Much of the *Cogitata* went right into *Novum Organum*; it contains one questionable sentence that was not destined to join its sisters there and upon which Keller pounces. Third, in the later 1612 *Description of the Intellectual Globe* (*Works V*, p. 506), Bacon repeats this line but softens it: he warns us against making the "subtle error," one that causes "despair," of thinking that science has "no power to make radical changes, and shake her in the foundations." Both *conquer* and *subdue* are gone. And in an analogous passage in the late *De Augmentis* (1623), Bacon altogether redeems himself linguistically by advising against the "subtle error" of thinking, with "premature despair," that science has "by no means [the power] to change, transmute, or fundamentally alter nature" (*Works IV*, p. 294). Now the rest, *shaking* the foundations, is gone. (Still, how can one hope for a science that will alter nature "fundamentally," when nature "governs everything"?)

Guided into Bacon by Harding, Merchant, and Keller, one expects to find his work cluttered with scandalous metaphors. But Keller unveils only one clearly ugly line out of thousands of pages of Bacon's life work, and this, "make her your slave," occurs in a tiny fragment of a manuscript written at the dawn of his philosophical career and never meant for publication (the 1603 *Masculine Birth*, first published posthumously, 1653; Farrington, 1964, p. 57). And "shake her to her foundations" (*Cogitata*) is either expunged from, or revised in, Bacon's later writings. In "Feminism and Science," a paper widely reprinted,²¹ Keller bizarrely reproduces these two lines, and *only* these two, in order to discredit the new science (1982, p. 598).²² To poke through these essays and parade their meanest two lines as the truth about Bacon and the new science, without any methodological reluctance, is uncharitable and hostile.

In arguing, on behalf of the other side of the inconsistency, that Bacon's images sometimes express a different attitude, Keller mentions the well-known passages I cited above in which Bacon speaks about the scientist as the servant of nature and as obeying her. So Keller finds a "puzzle" in which the "ambiguities" of Bacon's images "become contradictions." Science is "aggressive yet responsive, powerful yet benign, masterful yet subservient, shrewd yet innocent" (1985, p. 37). Keller solves the problem by sensing, in *Masculine Birth*, that Bacon viewed the human mind as *hermaphroditic* (1985, p. 38; see also 1980, p. 304, and its subtitle). As she interprets Bacon:

To receive God's truth, the mind must be pure and clean, submissive and open. Only then can it give birth to a masculine and virile science. That is, if the mind is pure, receptive, and submissive in its relation to God, it can be transformed by God into a forceful, potent, and virile agent in its relation to nature. Cleansed of

contamination, the mind can be impregnated by God and, in that act, virilized: made potent and capable of generating virile offspring in its union with Nature.

There is as little in the extremely brief *Masculine Birth* to support Keller's elaborate reading of Bacon as there is in *De Augmentis* to support Harding's perception of rape. The fragments of this essay are themselves a puzzle and not to be entrusted with the task of clarifying vexatious passages in Bacon's mature works. Further, Keller's idea does not obviously represent progress in understanding Bacon. To say that Bacon's model of the mind is hermaphroditic, that for Bacon, the knowing or scientific mind was sometimes a virile male and sometimes a receptive female, is only to repeat or redescribe what we already know, that for science Bacon used images both of "masculine" domination over, and "feminine" submission to, nature. This abundance of contrary images suggests to me that gender images in Bacon are *less* interesting and deep than Keller's elaborate reading makes them out to be.

The incoherence of Bacon's images goes beyond the one contrast Keller exhibits. Consider, for example, how indiscriminately, in *Novum Organum* alone, Bacon uses bondage imagery. In one passage, he bemoans that "men's powers" have been "bound up" by the "enchantments of antiquity" (84). In another, he criticizes logical demonstrations on the grounds that they "make the world the bond-slave of human thought, and human thought the bond-slave of words" (69). And lest we get the impression that nature is the only object of bondage, Bacon recommends that the human mind should be bound--it will do us some good. For the sake of the improvement of knowledge, scientists should "bind themselves to two rules" (130) and "the understanding must not . . . be supplied with wings, but rather hung with weights, to keep it from leaping and flying" (104). To say that the mind is, for Bacon, an appropriate object of beneficial bondage quite because the mind is sometimes or partially female, is a stretch. Another example: the effect of matter on the course of nature is, almost incomprehensibly, more dramatic and graphic, in Bacon's language, than what science does, or can do, to nature ("hound" and "drive"). Bacon writes in *De Augmentis* (see also *Parasceve*, *Works IV*, p. 253) that nature

is either free, and follows her ordinary course of development; . . . or she is driven out of her ordinary course by the perverseness, insolence, and frowardness of matter, and violence of impediments; as in the case of monsters; or lastly, she is put in constraint, moulded, and made as it were new by art and the hand of man; as in things artificial. (*Works IV*, p. 294)

The contrast is somewhat sharper in *Description of the Intellectual Globe* (*Works V*, pp. 505-506):

For nature is either free . . . or again she is forced and driven quite out of her course by the perversities and insubordination of wayward and rebellious matter, and by the violence of impediments; . . . or lastly, she is constrained, moulded, translated, and made as it were new by art and the hand of man.

Constraint of nature by the human hand need not be vicious, violent, a bit of torture, perverse. A bush--as natural a piece of nature as one can imagine--can be gently pruned, thereby constrained, "made as it were new by art," watered and fed; and, as a result, it will both thrive and bring us pleasure.

There is another inconsistency in Bacon's images or, perhaps, a dualism in his attitude toward nature. On the one hand, nature is profoundly wise and subtle, so discovering Nature's Ways requires not just diligence but shrewd intelligence. Similarly, in Bacon's world--he and his peers are gentleman, not barroom bruisers--women are wooed with poetry, or bribed, or promised a love that will not be forthcoming. Comprehending the secrets of nature might be like uncovering the secrets of a woman, but it is the brain, not brawn, that yields the joys of science and sex. On the other hand, nature is also, for Bacon, one tough cookie, whose floods and hurricanes and famines and pestilences kill us and destroy our property. No wonder, then, that Bacon speaks about constraining and forcing nature. But neither image in this dualism--nature is smart but, with luck and skill, can be seduced; nature is cruel but, with luck and skill, we can avoid the worst of it--is obnoxious. Bacon's mistake was similar to Feyerabend's, who conceived of women only as kittens or stern mistresses, which imagery excessively narrows the modes of existence possible for them. Bacon's dualism is not the same as Feyerabend's, but maybe both Baconians and Feyerabendians can be prodded into avoiding these mildly sexist polarities and to think, instead, in terms of an equal relationship with an independent and capable woman of substance. If we are to believe Harding, this could only "foster the growth of knowledge."

I suggest, given the wide variety of Bacon's metaphors, that we not take them *very* seriously as attempts at deliberate manipulation of his audience or as the smoke signals of his seething unconscious. They are more plausibly "literary embellishments" than a "substantive part of science" (*contra* Harding, 1991, p. 44) and, as Bacon says in *Description of the Intellectual Globe* (*Works V*, p. 506), irrelevant to his message:

[I]f any one dislike that arts should be called the bonds of nature, thinking that they should rather be counted as her deliverers and champions, because in some cases they enable her to fulfil her own intention by reducing obstacles to order; for my part I do not care about these refinements and elegancies of speech; all I mean is, that nature, like Proteus, is forced by art to do that which without art would not be done; call it what you will,--force and bonds, or help and perfection.

As we are rightly rereading the canon through feminist lenses, let us take care lest we succumb to the "impatience of research." Otherwise in our investigations, be they philosophical, scientific, or historical, we will discover precisely that which we hoped to discover, and we will project into the canon horrors that are not there.

NOTES

* Assistance was provided by the University of New Orleans and its College of Liberal Arts, through the release time of a Research Professor appointment, and by the Research Support Scheme of the Open Society Institute, formerly of the Central European University (grant 1520/706/94). Edward Johnson was a patient sounding board for my ideas and in numerous ways facilitated the essay's progress; Lynn Hankinson Nelson encouraged the project from the start; and Mariam Thalos read the essay thoroughly and spotted some mistakes. The anonymous referees of this journal made some useful suggestions and sent me to additional passages in Bacon. I am also grateful for the comments of Fehér Márta, Bendl Júlia, Benedek András, Forrai Gábor, Margitay Tihamér, and others at the Philosophy Institute of the Hungarian Academy of Sciences, where an ancestor of this paper was presented in May 1994. (Travel to Budapest was made possible by grants from the International Research and Exchanges Board and the Hungarian Ministry of Culture and Education.) The main idea for this version was arrived at on Hoff Street, in Philadelphia, Pa., August, 1994.

1. See Bordo (1987, pp. 107-108); Longino (1988, p. 563; 1990, p. 205); Nelson (1990, pp. 213, 353 n. 136); Tuana (1990, p. 62)--all under the influence of Harding, Merchant, and Keller.

2. I quote from Feyerabend because Harding (1991, p. 43) gives, as his last sentence, "I think I do not have to explain my own preferences." In her (1986), Harding quotes it correctly (p. 120).

3. Although Harding takes his metaphor as being about "science and its theories" (1986, 121), and Feyerabend agrees (1970, p. 229), it makes equal sense to read it as being about the nature of the reality that lies beyond science. We should not view Nature as a stern and demanding mistress, which it for Popper and Lakatos: their Nature screams "False!" or "Incompatible!" when it does not like our scientific theories. Instead, Nature is an indulgent courtesan, one who lets do *whatever we want*--in theory construction. It is Nature that whispers "Anything goes, big guy," not Science.

4. For an overview of Bacon's life and philosophy, see Thomas Macaulay's 1837 essay on Bacon and John Robertson's critical reply (1905, pp. vii-xvi).

5. The two sentences are from Bacon's 1623 *Of the Dignity and Advancement of Learning*, *Works IV*, 296; hereafter, *De Augmentis*. Harding took the passage not from Bacon but from Merchant (1980, p. 168), who took it from *Works IV*.

6. Keller also argues (1978, pp. 412-413, 429; 1985, p. 91) that the Baconian scientist is *asexual*; even though he dominates a female nature, the marriage they have is chaste, cold, distant, detached. This sits uneasily with Bacon's "conquest" of nature being forceful sexual seduction, let alone rape.

7. Rossi suggests that Bacon, in "Erichthonius," expressed his view that to be successful with nature, science has to "humbly beg her assistance" (1968, p. 101; see also "humble respect," p. 105). Keller (1985, p. 37) quotes Rossi, but not *this* phrase, creating the impression that he agrees with her "forceful and aggressive seduction" reading.

8. Harding quotes these two *De Augmentis* sentences three times in two books, always informing us that her source was Merchant's *The Death of Nature* (1980, p. 168). Merchant includes the five missing words. In addition to failing to mark an ellipsis in the first of Bacon's two sentences, Harding made a second mistake in *WS?WK?*: ellipsis points belong *between* the two sentences, since Harding omitted a large chunk. Any hint of rape created by the *juxtaposition* of these sentences in *WS?WK?* is therefore artificial. There are other errors (cf. *Works IV*, p. 296). In Merchant, we correctly find "these holes," while in Harding "those." Merchant and Harding write "whole object," but both are wrong; "sole object" is correct. Merchant, and Harding in *SQIF*, gives "drive her afterward," but both are wrong; in *WS?WK?* Harding got "afterwards" right.

9. See also Bordo's remark on this sentence from *De Augmentis*, apparently provoked by Keller and Merchant: it illustrates "the famous Baconian imagery of sexual assault" (1987, pp. 107-108).

10. Henceforth I supply for *Novum Organum* only the *Book I* aphorism number.

11. This is reminiscent of Merchant on Bacon's experimentalism: "Here, in bold sexual imagery, is the key feature of the modern experimental method--constraint of nature in the laboratory" (1980, p. 171).

12. Bacon was no blind optimist: he recognized that science done poorly would go wrong. See, for example, "Daedalus" (Myth 19) in *Wisdom of the Ancients* (Robertson, pp. 842-43).

13. See my (1985), at pp. 73-74.

14. Similarly, it will not help Harding to claim that her experiences and social location as a feminist or woman grant her an epistemic advantage--in this case, they make her an especially perceptive reader of early seventeenth-century texts (see her 1991, pp. 121-33, 150-51, and my [1992] and [1994].) Harding's reading of Bacon is a politically inspired reading that goes wrong, and so subverts her claim that feminist scholarship is better *because* it is deliberately political.

15. Merchant's "a" true judgment should be "the." See note 8, above.

16. Robbins (1959, pp. 278-279). He suggests--sounding a contemporary note--that James's realization that children had been "falsely charging people as witches" was crucial for his change of mind.

17. See Farrington, 1964, pp. 48-49.

18. Keller (1978, p. 413; 1980, p. 301; 1985, p. 36) took this sentence from Leiss (1972, p. 25), who took it from Farrington's translation (1964, p. 131). *Redargutio Philosophiarum* is not translated from the Latin in *Works III* (pp. 557-85), and was not published until 1734 (Farrington, 1964, p. 57).

19. In "Atalanta," Myth 25 of *Wisdom of the Ancients* (Robertson, pp. 847-48), Bacon says "Art remains subject to Nature, as the wife to the husband." It seems that Bacon is reversing his purportedly favorite misogynous analogy; instead of the husband science dominating his woman nature in a patriarchal marriage, science is the unfortunate wife who is dominated by nature the man. But his point here has nothing to do with gender; he is saying that science (Atalanta) will not win the race with nature (Hippomenes) if she allows herself to be distracted by baubles--impatiently, quickly gained research results that eventually prove worthless. Bacon uses the Atalanta-and-apples story often, without any obfuscating marital or gender image; see *Novum Organum*, 70, 117, and "The Plan" of *The Great Instauration* (*Works IV*, p. 29).

20. In her 1980 essay (p. 308, n. 11), and its revision in *Reflections* (1985, p. 36), Keller claims to have taken this passage from Spedding's *Description of the Intellectual Globe*, *Works V*, p. 506; it is not there. In her 1982 essay (p. 598, n. 22), she again says that it is from *Description of the Intellectual Globe*, but now cites p. 506 of Robertson's collection instead of Spedding's *Works*. On that page, however, is *De Augmentis, Book V*, chap. 2. The passage is in Farrington's translation of *Cogitata et Visa* (*Thoughts and Conclusions*; 1964, p. 93). See also Leiss (1972, pp. 58, 216 n. 18).

21. Harding and O'Barr, 1987, pp. 233-46; Boyd *et al.*, 1991, pp. 279-88.

22. Merchant mentions the "slave" passage twice in the space of two pages (1980, pp. 169, 170); and see Bleier (1984, pp. 204-205), who condemns Bacon by reproducing only the "slave" passage, which she took from Keller's (1982).

REFERENCES

Bacon, F. (1857-74). *The Works of Francis Bacon, Vols. I-XIV*, J. Spedding, R. L. Ellis, & D. D. Heath (Eds.). London: Longman and Co. (*et al.*). Reprint (1962-63). Stuttgart: Verlag.

Bleier, R. (1984). *Science and Gender*. New York: Pergamon Press.

Bordo, S. (1987). *The Flight to Objectivity*. Albany, NY: SUNY Press.

Boyd, R., Gasper, P., & Trout, J. D. (Eds.). (1991). *The Philosophy of Science*. Cambridge: The MIT Press.

Farrington, B. (1964). *The Philosophy of Francis Bacon*. Liverpool: Liverpool University Press. Reprint (1966). Chicago: University of Chicago Press.

Feyerabend, P. (1970). Consolations for the specialist. In I. Lakatos & A. Musgrave (Eds.), *Criticism and the Growth of Knowledge* (pp. 197-230). Cambridge: Cambridge University Press, 197-230.

Harding, S. (1986). *The Science Question in Feminism*. Ithaca: Cornell University Press.

----- (1989). Value-free research is a delusion. *The New York Times*, 22 October, p. E 24.

----- (1991). *Whose Science? Whose Knowledge?* Ithaca: Cornell University Press.

Harding, S. & O'Barr, J. F. (Eds.). (1987). *Sex and Scientific Inquiry*. Chicago: University of Chicago Press.

Keller, E. F. (1978). Gender and science. *Psychoanalysis and Contemporary Thought*, 1, 409-433.

----- (1980). Baconian science: A hermaphroditic birth. *Philosophical Forum*, 11, 299-308.

----- (1982). Feminism and science. *Signs*, 7, 589-602.

----- (1985). *Reflections on Gender and Science*. New Haven: Yale University Press.

Leiss, W. (1972). *The Domination of Nature*. New York: George Braziller.

Longino, H. (1988). Review essay. Science, objectivity, and feminist values. *Feminist Studies*, 14, 561-74.

----- (1990). *Science as Social Knowledge*. Princeton: Princeton University Press.

Macaulay, T. B. (1967). Francis Bacon. In *Critical and Historical Essays, Vol. 2* (pp. 290-398). New York: Dutton; Everyman's Library.

Merchant, C. (1980). *The Death of Nature*. New York: Harper and Row.

Morgan, R. (1977). *Going Too Far*. New York: Random House.

Nelson, L. H. (1990). *Who Knows. From Quine to a Feminist Empiricism*. Philadelphia: Temple University Press.

Robertson, J. M. (Ed.). (1905). *The Philosophical Works of Francis Bacon*. London: George Routledge and Sons.

Robbins, R. H. (1959). *The Encyclopedia of Witchcraft and Demonology*. New York: Crown Publishers.

Rossi, P. (1968). *Francis Bacon. From Magic to Science*. London: Routledge and Kegan Paul.

Soble, A. (1985). Pornography: Defamation and the endorsement of degradation. *Social Theory and Practice*, 11, 61-87.

----- (1992). Review of Harding, *Whose Science? Whose Knowledge?*, in *International Studies in the Philosophy of Science*, 6, 159-62.

----- (1994). Gender, objectivity, and realism. *The Monist*, 77, 509-530.

Tuana, N. (1990). Review of Harding & O'Barr, *Sex and Scientific Inquiry*, in *American Philosophical Association Newsletter on Feminism and Philosophy*, 89, 61-62.