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Francis Bacon, Feminist Historiography, and the Dominion of Nature

Brian Vickers

The history of ideas is an unstable business. Schools of thought are set up, fought over, and vanish. Utilitarianism, existentialism, deconstruction, and many other systems have suffered the extinction signalled by that medieval *topos* for an ephemeral existence: *ubi sunt*? The reputations of philosophers, too, rise and fall irrationally, like the movements of stock markets. Perhaps no major figure has been subject to so many fluctuations as Francis Bacon. The moving spirits in the early Royal Society idolized him, Voltaire and Diderot lauded him, Blake damned him. Macaulay and De Maistre annihilated him, Whewell and Spedding resuscitated him, and so on. As Paolo Rossi put it, “Glorifications and denigrations continuously alternate in the history of . . . Bacon’s fortunes.”¹ The litany of complaint being limited, the same objections repeat themselves. In 1937 L. C. Knights made Bacon responsible for scientific materialism, industrial civilisation, the internal-combustion engine, soil erosion, and America.² In the 1980s three feminists (Sandra Harding, Evelyn Fox Keller, and Carolyn Merchant) set out to discredit Bacon, and the Scientific Revolution to which he contributed, by alleging that he had advocated “the rape and torture” of nature.³

¹ See Paolo Rossi, “Ants, spiders, epistemologists,” in *Francis Bacon. Terminologia e fortuna nel XVII secolo*, ed. Marta Fattori (Rome, 1984), 245–60, at 245.

² Knights, “Bacon and the Seventeenth-Century Dissociation of Sensibility,” in *Explorations* (London, 1946), 92–111.

³ See Sandra Harding, “The Norms of Social Inquiry and Masculine Experience,” *PSA 1980: Proceedings of the Biennial Meeting of the Philosophy of Science Association 2* (1980): 305–24; Harding, *The Science Question in Feminism* (Ithaca: Cornell University

Their indictment, which was (unsurprisingly) well received in feminist circles, produced several effective rebuttals from historians of science.⁴ However, feminists have recently revived it, with added support from environmentalists seeking the origin of our current ecological crisis. In September 2006 *Isis*, the journal of the History of Science Society, published a “Focus” symposium called “Getting Back to *The Death of Nature*: Rereading Carolyn Merchant,” in which she was fêted for her “eco-feminism.”⁵ Since the symposium was introduced by Joan Cadden, current editor of the journal, and was produced under the auspices of “the History of Science Society’s Women’s Caucus,” it seems to carry official approval. Two of the contributions, by Katharine Park⁶ and Carolyn Merchant⁷ herself, reassert the feminist case against Bacon. In this essay I want to review their indictment and to strengthen Bacon’s defense.

The issues at stake in this debate are the status of *The Death of Nature* as a contribution to the history of science, and the reasons for its poor reception “among English-speaking historians of early modern science,” who, according to Park, “mostly ignored or marginalized” it, “despite its importance,” whereas “historians interested in feminist or environmental studies” welcomed it (Park, p. 487). Park attempts to explain the indifference shown by historians of science as due to external factors, “the generalist vision in the history of science,” on the one hand, and the internalism / externalism debates of the 1960s and 1970s on the other (p. 489). For the first, Merchant allegedly presented “a wonderful example” of “grand narrative,” which “still has an important role to play in a feminist histori-

Press, 1986); and Harding, *Whose science? Whose knowledge?* (Ithaca, NY, 1991); Evelyn Fox Keller, “Baconian Science: A Hermaphroditic Birth,” *Philosophical Forum* 11 (1980): 299–308; Keller, “Feminism and Science,” *Signs* 7 (1982): 589–602; and Keller, *Reflections on Gender and Science* (New Haven: Yale University Press, 1985), which includes the essay “Baconian Science: The Arts of Mastery and Obedience”; Carolyn Merchant, *The Death of Nature: Women, Ecology and the Scientific Revolution* (San Francisco: Harper & Row, 1980).

⁴ See Noretta Kroetge, “Methodology, Ideology, and Feminist Critiques of Science,” *PSA* 1980, 2: 346–59, at 351–56; Alan Soble, “In Defense of Bacon,” *Philosophy of the Social Sciences* 25 (1995): 192–215; quoted from revised version, “In Defense of Bacon,” in *A house built on sand: exposing postmodern myths about science*, ed. Noretta Kroetge (New York, 1998), 195–215; Peter Pesic, “Wrestling with Proteus: Francis Bacon and the ‘Torture’ of Nature,” *Isis* 90 (1999): 81–94; Perez Zagorin, *Francis Bacon* (Princeton: Princeton University Press, 1998), 121–23.

⁵ *Isis* 97 (2006): 483–533.

⁶ Katharine Park, “Women, Gender, and Utopia. *The Death of Nature* and the Historiography of Early Modern Science,” *ibid.*: 487–504; hereafter referred to as “Park.”

⁷ Carolyn Merchant, “The Scientific Revolution and *The Death of Nature*,” *ibid.*: 513–33; hereafter referred to as “Merchant 2006.”

ography of science” (p. 489). For the second, Park believes that “for historians of early modern science in the 1970s and early 1980s . . . the internalism / externalism debates reduced in practice to a single topic” the claims made by Frances Yates that “Hermeticism” was a prime agent in creating the Scientific Revolution (p. 491). Although an admirer, Park believes that Merchant’s thesis is “much subtler and more complicated” than Yates’s (p. 492), hailing *The Death of Nature* as “an exciting, living piece of scholarship” (p. 493) with a “rich, energetic, and provocative argument” (p. 490).

Neither of the reasons adduced by Park to account for Merchant’s failure to receive a glowing endorsement from historians of science seems plausible. A “grand narrative” will always find approval if its case is well argued, draws on a wide range of historical evidence, appropriately interpreted, and which shows the historian to be dispassionate or at least not *parti pris*. The same scholarly criteria apply to all ventures in history-writing, internalist, externalist, or whatever name we choose to give them. Park failed to consider a third possible reason why historians of science have been unimpressed with *The Death of Nature*, that it failed to satisfy these scholarly criteria. Further, Park’s favored concept of “a feminist historiography of science” needs questioning since, rather than approaching its topic without preconceptions, it seems to be fuelled by what sociologists call *ressentiment*.

FEMINIST “RESSENTIMENT” AND THE WRITING OF HISTORY

Katharine Park begins her recent defense of Merchant by quoting Joan Kelly’s 1977 essay, “Did Women have a Renaissance?,” which prophesied that, if only historians took “‘the emancipation of women as a vantage point’” they would “‘discover that events that further the historical development of men, liberating them from natural, social, or ideological constraints, have quite different, *even opposite*, effects upon women’” (Park, p. 487; my italics). According to Merchant’s description, her book “argued that seventeenth-century mechanistic science itself contributed to the most pressing ecological and social problems of our day and dared to suggest that women were as much the *victims* as the beneficiaries of the progress of science” (Merchant 2006, p. 517; my italics). One obvious rejoinder to those statements would be to ask, how many men, in the period 1500–

1700, felt liberated from “natural, social, or ideological constraints” by natural philosophy, or saw themselves as its “beneficiaries”? surely very few. Certainly, the position of men, at all levels of society, was more advantageous than women, as it continues to be, deplorably enough. Merchant specifically indicted “‘the Scientific Revolution’” for not “liberating the human mind and laying the foundations for general human happiness” (Park, p. 490). But it is a commonplace in the history of science that what we name from our perspective “the Scientific Revolution” brought precious few benefits to anyone, male or female. Despite the great advances made in understanding planetary motion, despite the rise of experimentation and the invention of scientific instruments, no-one enjoyed direct benefits in the way of increased health, life-expectancy, agricultural productivity, or reduced work-loads.

But the point I wish to engage here concerns the categories which Merchant and Park use. I believe that modern social history encourages us to see the relation between the sexes in the early modern period in terms of “more / less,” rather than “all / nothing.” The dichotomizing of gendered relations into “opposite” poles expresses the sense of grievance and complaint about fundamental injustices that has marked feminism since its outset. Of course, the struggle to emancipate women in all areas of society is a wholly admirable enterprise which, even in the West, is far from complete. But to project grievance and complaint on to the past does not make for good history writing. The term *ressentiment*, coined by Nietzsche to attack Christian morality, and given a wider validity by Max Scheler,⁸ describes the feelings of powerlessness and impotence produced by inequalities in social relationships. From “its very origin,” as Scheler put it, *ressentiment* is “chiefly confined to those who *serve* and are *dominated* at the moment, who fruitlessly resent the sting of authority” (p. 48), an emotional state to which, given prevailing social structures, women are particularly prone (pp. 60–62). Scheler highlighted several damaging effects of this self-image of victimhood, as when the “tension between desire and nonfulfillment” (p. 52) distorts the subject’s view of the world, and of those who are perceived as dominating her. For feminist historians, I contend, the *ressentiment* of victimhood distorts their view of the past,⁹ as in Park’s endorsement of Merchant’s

⁸ Friedrich Nietzsche, *On the Genealogy of Morals*, I.10, tr. Walter Kaufmann (New York: Vintage Books, 1968), 472–36; Max Scheler, *Ressentiment* [1915], tr. W.W. Woldheim, ed. and intro. Lewis A. Coser (New York: Free Press, 1961).

⁹ Some feminists are aware of this problem, e.g., Marion Tapper, “*Ressentiment* and Power. Some Reflections on Feminist Practices,” *Nietzsche, Feminism and Political The-*

pointed and in my view generally accurate analysis of Francis Bacon's description of the search for natural knowledge in terms of a physically coercive relationship between male inquirer and female nature, expressed in metaphors of marital discipline, inquisition, and rape. (Park, p. 408)

In a footnote Park takes issue with those "Friends of Bacon" who defended him from these charges by pointing out that in fact he "envisaged the relationship between natural philosopher and nature in terms of marriage, not rape or physical coercion. . . ." Park simply brushes these objections aside without discussion, widening the accusation to take in (seemingly) the whole of Renaissance England. She accuses Bacon's defenders of "tend[ing] to discount the ways in which the contemporary ideology of marriage associated this with rape, defined in classical terms as the forcible capture or kidnapping of a women [sic] for purposes of marriage or procreation" (p. 408, n. 4).

I take this to be an instance where *ressentiment* has distorted the historian's view. Was "the contemporary ideology of marriage" in Bacon's day truly based on "rape, defined in classical terms" (whatever "classical" means)? Social historians of the early modern period would be surprised at this statement. Rape was a statutory offense, punishable by hanging, dealt with in criminal courts, although some cases were heard in the ecclesiastical courts. The Anglican *Book of Common Prayer* ordained three purposes for marriage: for "the procreacion of children," as "a remedy agynst sinne . . . and fornication," and "for the mutuall societie, helpe and comfort that the one ought to have of the other, both in prosperitie and adversitie."¹⁰ Over the last twenty-five years a number of important contributions to early modern English social history, by Keith Wrightson, R. B. Outhwaite, Ralph Houlbrooke, and David Cressy, have shown that the *ressentiment* of first-generation feminism, enshrined in Lawrence Stone's all-purpose explanatory concepts of "patriarchy" and "misogyny," needs severe correction.¹¹

ory, ed. Paul Patton (London: Routledge, 1993), 130–43; Vikki Bell, *Feminist Imagination* (London: Sage, 1999), 40–61.

¹⁰ See *The First Prayer-Book of King Edward VI, 1549* (London, n.d.), 233.

¹¹ See, e.g., *Marriage and Society. Studies in the Social History of Marriage*, ed. R. B. Outhwaite (London: St. Martin's Press, 1981); Keith Wrightson, *English Society 1580–1680* (New Brunswick, N.J.: Rutgers University Press, 1982); Ralph Houlbrooke, *The English Family, 1450–1700* (Harlow: Longman, 1984); Martin Ingram, *Church Courts, Sex and Marriage in England, 1570–1640* (Cambridge: Cambridge University Press, 1987); *English Family Life, 1576–1716. An Anthology from Diaries*, ed. Ralph Houlbrooke (Oxford: Blackwell, 1988); David Cressy, *Birth, Marriage, and Death. Ritual,*

Marriage was a companionable relationship, based on a division of responsibilities and mutual respect. Park's jaundiced view of early modern attitudes to marriage and the family is not representative of feminist social history, which has presented a more balanced account of relations between the sexes. Restrictions of human activities within polarized gender boundaries can only be damaging to all concerned.

MISUNDERSTANDING BACON'S METAPHORS

All who have defended Bacon have recognized that the feminists' indictment was not based on a detailed and dispassionate analysis of his program for the reform of natural philosophy, but on a hostile interpretation of a few of his metaphors. Their examples are all taken from a tiny section of his extensive output stretching over nearly forty years, a single chapter (Book 2, chapter 2), of his *De augmentis scientiarum* (1623), in the Victorian translation by Spedding and others. (Merchant seems at times unsure of the text's original language.¹²) Despite this lamentably small sample, Merchant still defends "feminist readings of his rhetoric," judged only from "the imagery that he used," for concluding that "Bacon's goal was to use constraint and force to extract truths from nature" (2006, p. 518; quoting *Death of Nature*, p. 168). Their accusations started from the fact that Bacon referred to Nature as "she." But he could hardly have done otherwise, since in Latin *natura* is a feminine noun, a gender it retains in modern European languages, both Romance and Germanic. However, as every language student knows, there is no necessary correlation between grammatical gender and sex, and the feminist appropriation of "Nature" does injustice to men, who are equally capable of nurturing crops and animals, albeit (until recently) excluded from the care of children. This gynomorphic identification of woman with nature has allowed "feminist historiography

Religion, and the Life-Cycle in Tudor and Stuart England (Oxford: Oxford University Press, 1997).

¹² Merchant refers to the "English edition of *The Advancement of Learning*" (2006, 519, 529n.), when it is an original work written in English; she describes the *Advancement*, which runs to 230 pages in Spedding's edition, as an "essay" (*ibid.*); she compares the changes Bacon made for the Latin expansion (1623) on the basis of its English translation by Spedding and others (p. 526); and in order to justify her denial of Peter Pesic's demonstration that Bacon carefully used the much milder term "*vexatio*," not *tortura*, she quotes "a recent French translation of the *Novum Organum* that renders the English phrase 'the vexations of art' in French as 'la torture des arts [mécaniques]'" (pp. 529). But the French translator (hopefully) worked from the original Latin text.

of science” to indict the Scientific Revolution as an androcentric activity which indulged in torture, rape, and other sexual crimes. But nature is not a woman; fortune is not a woman, nor is justice. You cannot “torture” nature, since she is not a percipient being able to experience pain, fatigue, or any other human feeling-state. This branch of feminist history-writing has turned accident into essence, reifying the grammatical category of an abstract noun into an essentialist, genderized concept of nature. And in any case, as Noretta Kroetge objected, “although Nature is always feminine, so were all institutions, such as the Church, the State, etc. Were these also to be dominated, exploited, and raped?” (Kroetge, pp. 353–54).

“The Friends of Bacon” or “FOBs” as Park calls them (to which the appropriate comment might be the saying attributed to Aristotle, “*amicus Plato, sed magis amica veritas*”) have used a variety of arguments in his defense. In 1981 Kroetge aptly quoted some well-known aphorisms from Book I of the *Novum Organum* in which Bacon “speaks of nature with a good deal of humility and respect” (p. 353):

I. Man, being the servant and interpreter of Nature, can do and understand so much and so much only as he has observed in fact or in thought of the course of nature . . .

III. Human knowledge and human power meet in one; for where the cause is not known the effect cannot be produced. Nature to be commanded must be obeyed. . . .

IV. Towards the effecting of works, all that man can do is to put together or put asunder natural bodies. The rest is done by nature working within. (4: 47).¹³

As Kroetge showed, these and other passages in his work effectively challenge the feminists’ demonization of Bacon, and modern science. The last sentence quoted, with Bacon’s concept of nature actively “working,” is enough to refute Merchant’s allegation that he envisaged nature “stripped of activity and rendered passive” (2006, p. 514). But Katherine Park, speaking for feminist historiography, ignores Bacon’s text, accusing him of having influenced the new science to reject “the respectful metaphor of nature as benevolent and nurturing mother” for one “of nature as an indifferent, destructive, and uncontrollable woman” (Park, p. 490). Did any

¹³ Quotations are from *The Works of Francis Bacon*, 14 vols., ed. James Spedding, R. L. Ellis, and D. D. Heath (London, Longman and Green, 1857–84), with volume and page number; here, 4: 47 (for the Latin text see 1: 157).

exponent of early modern natural philosophy think in those terms? It is hard to recall any, and Bacon certainly did not. The feminist indictment of science erred in other respects, as Kroetge pointed out: “whatever the metaphorical and political parentage of science may turn out to be, we must still judge these methods of inquiry on their own merits” (p. 354).¹⁴ As she put it, the feminist critiques “fail to account for the good features of science” (p. 356). In a matching response Perez Zagorin has eloquently defended the “enormous intellectual achievement” of modern science, descending directly from the “revitalized natural philosophy” that Bacon helped to inaugurate, and the many benefits it has brought mankind, “in the form of great new knowledge and improved well-being” (pp. 122–23). So much is surely obvious to all but science’s most blinkered enemies.

Defenders of Bacon have accused feminists of not only misrepresenting his attitude to nature, but of mis-reading his metaphors. Kroetge warned them in 1981 that “One must look carefully at the context in which metaphors occur and how they operate within that context. Sometimes metaphors serve a positive heuristic function . . . as in the case of billiard-ball models of atoms. Other times metaphors play a rhetorical or polemical role . . .” (p. 354). Bacon was certainly aware of all these functions of metaphor. In the *Advancement of Learning* (1605) he discussed the difficulty of communicating “that knowledge which is new and foreign from opinions received,” pointing out that those scholars

whose conceits [conceptions] are beyond popular opinions, have a double labour; the one to make themselves conceived [understood], and the other to prove and demonstrate; so that it is of necessity with them to have recourse to similitudes and translations to express themselves. (3: 406–7)

The Latin term for metaphor is *translatio*, hence “translations,” and Bacon emphasizes their centrality to the discovery and communication of knowledge by concluding his discussion with the enunciation of “a rule, *That whatsoever science is not consonant [suitable] to presuppositions, must pray in aid of similitudes*” (3: 407). To “pray in aid” is to call to one’s assistance, and anyone who studies Bacon will see that he made great use of

¹⁴ In “Feminist Criticism of Metaphors in Bacon’s Philosophy of Science,” *Philosophy* 73 (1998): 47–61, Iddo Landau developed this argument, that even if Bacon’s metaphors had expressed misogynistic attitudes to nature, this would not invalidate his program for renewing natural philosophy.

metaphor throughout his career, for heuristic, explanatory, and evaluative purposes.

Alan Soble also noted the importance of reading a metaphor in context in order to interpret it correctly, an injunction ignored by Bacon's three feminist critics. By comparing the quotations they made with the original texts, Soble showed that they had vied with one another in selective quotation, omitting key elements which defined Bacon's meaning, and drawing false conclusions from the passages quoted (pp. 199–201, 203–6). That they omitted important qualifications and ran together two detached passages to insinuate a meaning unintended by Bacon, while ignoring the explicit meaning of the text, may be a sign of careless or of unscrupulous interpretation. Either way, they are not faults that a careful historian will make.

While wholly endorsing Kroetge and Soble's critiques, I suggest that the feminists' misinterpretations of Bacon derive from a deeper failing, a misunderstanding of the workings of metaphor itself. The first extended discussion of metaphor was provided by Aristotle in his *Rhetoric*,¹⁵ who recommended writers to use metaphors and comparisons, but urged that they "must fairly correspond to the thing signified: failing this, their inappropriateness will be conspicuous: the want of harmony between two things is emphasized by their being placed side by side" (3.2; 1405a10ff.). For Aristotle metaphor sets up what might be called a zone of relevance within which the mind can perceive resemblances and make the needed "transfer" of selected associations (hence the Latin term *translatio*). So, "in using metaphors to give names to nameless things, we must draw them not from remote but from kindred and similar things, so that the kinship is clearly perceived as soon as the words are said" (1405a35ff.). At intervals in its history metaphor has been understood as a binary process, involving a mental movement or translation between two domains of meaning, as in Aristotle's reference to "two things . . . being placed side by side." Writing in about 1600 John Hoskyns valued metaphor "because it enricheth our knowledge with two things at once, with the truth and with the similitude."¹⁶ But it was not until 1936 that I. A. Richards concisely formulated what had been an operative concept for over two millennia when he introduced the terms "tenor" and "vehicle" to define metaphor: the tenor is "the

¹⁵ Quotations are from *The Complete Works of Aristotle. The Revised Oxford Translation*, 2 vols., ed. Jonathan Barnes (Princeton: Princeton University Press, 1984).

¹⁶ John Hoskyns, *Directions for Speech and Style*, ed. Hoyt H. Hudson (Princeton: Princeton University Press, 1935), 8.

underlying idea or principal subject which the vehicle or figure means.”¹⁷ Richards pointed out that

in many of the most important uses of metaphor, the co-presence of the vehicle and the tenor results in a meaning (to be clearly distinguished from the tenor) which is not attainable without their interaction. [For] the vehicle is not normally a mere embellishment of a tenor which is otherwise unchanged by it, but . . . the vehicle and tenor in co-operation give a meaning of more varied powers than can be ascribed to either. (p. 100)

In the workings of metaphor “tenor and vehicle . . . co-operate in an inclusive meaning” (p. 119), an interplay involving elements which are both like and unlike each other (p. 120), including some “belonging to very different orders of experience” (p. 124).

In her diatribe Merchant failed to respect the imaginative interaction between tenor and vehicle which is such a striking feature of Bacon’s writing. Recurringly, she ignored the tenor (in Richards’s terms, “the underlying idea or principal subject which the vehicle or figure means”), collapsing the two poles into one. Then she lumped the vehicles together in order to ascribe “misogynistic” attitudes to Bacon. In 1980 she drew up her case against him in these terms:

Much of the imagery [Bacon] used in delineating his new scientific objectives and methods derives from the courtroom, and, because it treats nature as a female to be tortured through mechanical inventions, strongly suggests the interrogations of the witch trials and the mechanical devices used to torture witches. In a relevant passage, Bacon stated that the methods by which nature’s secrets might be discovered in investigating the secrets of witchcraft by inquisition, referring to the example of James I. (*Death of Nature*, p. 168)

In her most recent essay Merchant perpetrated a simple logical fallacy (*petitio principii*) by posing the question, “What were Bacon’s views about the torture of nature and of witches?” She is forced to admit that “Bacon did not advocate the practice of torture or use of the rack on human beings,”

¹⁷ I. A. Richards, *The Philosophy of Rhetoric* (New York: Oxford University Press, 1936; 1965).

and once again has to fall back on his metaphors, since “He *nevertheless* [another sophism] used imagery drawn from torture in his writings . . .” (2006, pp. 523–24). But this is to elide from the literal to the metaphorical, and back to the literal, as if they all exist on the same level of reality. Merchant bolsters her indictment by adding quotations from various ancient and modern works dealing with witchcraft and torture, even including an illustration of a “replica of the rack” on display in the Tower of London (pp. 518–28), as if this device could somehow stand for Bacon’s metaphor. Evidently Merchant has ignored the contextual functions of these images for heuristic or persuasive purposes, reducing them to their vehicles, which are then reified as actual mechanical devices. In the passage that she cites from the *De Augmentis Scientiarum* (1623), Bacon reverted to a constant theme in his manifestoes for a new science from the 1590s onwards, the need to compile a substantial “Natural History” to deal with the three forms that nature takes, “the *course* of nature, the *wanderings* of nature, and *art*, or nature with man to help” (4: 295). In addressing the second of these Bacon deplores the absence of a “sufficient and competent collection of those works of nature which have a digression and deflection from the ordinary course of generations, productions and motions,” what he calls “the Heteroclites or Irregulars of nature” (*ibid.*). Bacon then describes the value of such a collection, in the “relevant passage” which Merchant selectively quoted. (I italicize the sentence to which Merchant objected.) According to Bacon, such a collection would have two valuable functions:

the one to correct the partiality of axioms and opinions, which are framed for the most part upon common and familiar examples; the other, because from the wonders of nature is the most clear and open passage to the wonders of art. *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.* (4: 295–96)

Spedding’s translation reproduces the metaphor that Bacon had used in the *Advancement of Learning*, stating that to pass “from the wonders of nature . . . towards the wonders of art, . . . it is no more but by *following and hounding Nature in her wanderings*, to be able to *lead* her afterwards to the same place again” (3: 331). In her recent essay Merchant intensified her hostile interpretation of this metaphor, telling readers that

The *Oxford English Dictionary* gives the following definition of the word “hound”: “to pursue, chase, or track like a hound, or, as

if with hound; esp. to pursue harassingly, to drive as in the chase”; it quotes the phrase from Bacon’s 1605 *Advancement of Learning* . . . as the first example. Other definitions of “hound” are equally violent: “to set (a hound, etc.) at a quarry; to incite or urge on to attack or chase anything” and “to incite or set (a person) at or on another; to incite or urge on.” Such meanings are reminiscent of the English foxhunt (outlawed by the British Parliament in 2005 for its excessive cruelty to the hounded and tortured foxes). (2006, p. 528)

Setting aside the gratuitous reference to fox-hunting, Merchant has chosen the most “violent” senses of the verb in modern English. Ironically enough, although she also reproduced the Latin version of this passage, she did not notice that its wording indicates a quite different meaning. In *De Augmentis scientiarum* the passage in question reads “*ut naturae vestigia persequaeris sagaciter, cum ipsa sponte aberret . . . deducere et compellere possis*” (1: 498). Lewis and Short’s *Latin Dictionary* defines “*vestigium*” as “foot-prints, foot-track, track,” and glosses “*sagaciter*” (from *sagax*, “of quick perception, whose senses are acute”), as “Quickly, sharply, keenly, with quickness of scent, with a fine sense of smell.” The metaphor of “hounding,” then, has nothing to do with hunting foxes, or people, but describes intellectual acuteness. That this is what Bacon meant by “hounding” is clear from the translation of the *De Augmentis* published by Gilbert Wats in 1640, in which Bacon’s concluding analogy reads:

For the busines in this matter is no more than by a quick scent to trace out the footings of nature in her wilfull wanderings; that so afterward you may be able at your pleasure, to lead or force her to the same place and postures again.¹⁸

In other words, the *Oxford English Dictionary* attributed an anachronistic modern sense to the verb “to hound,” which for Bacon carried no implications of violence. The quality that he called for in natural philosophy by the term *sagaciter* is a keen spirit of enquiry, an ability to follow clues and discover “the secrets of nature.” Bacon often used this metaphor of hunting when outlining his program of experiment and observation, as Katharine Park once observed. In her words, Bacon “referred to this program as

¹⁸ *Of The Advancement and Proficience of Learning or the Partitions of Sciences, IX Bookes* (Oxford, 1640), 81.

Learned Experience (*Experientia literata*) or, drawing on a favorite example, the Hunt of Pan. Learned Experience gave order and direction to experiment, so that the scientist did not waste time groping in the dark.”¹⁹ As Park concluded her careful (pre-feminist) exposition, “Bacon’s analogies here are purely heuristic, for they suggest lines of inquiry but do not provide explanations. Fully aware of their limitations, Bacon described Learned Experience as rather a sagacity and a kind of hunting by scent, than a science”²⁰ (p. 298). That is an insightful exposition of Bacon’s hunting metaphors, which have none of the destructive violence that Merchant, and subsequently Park, attached to them.

The second passage which Merchant cited in her accusation that Bacon drew his imagery from witchcraft trials was the continuation of the previously-quoted section:

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 in 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 examined) a useful light may be gained, not only for the true judgment of the offences 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 sole object*, as your Majesty has shown in your own example; who, with the two clear and acute eyes of religion and natural philosophy, have looked deeply and wisely into those shadows, and yet proved yourself to be truly of the nature of the sun, which passes through pollutions and is not defiled. (4: 296)

¹⁹ Katharine Park, “Bacon’s ‘Enchanted Glass,’” *Isis* 75 (1984): 290–302, at 297. This essay formed part of a useful symposium, “Bacon, Galileo, and Descartes on Imagination and Analogy.”

²⁰ The Latin text reads: “Atque de Literata Experientia haec dicta sunt, quae (ut jamante diximus) *sagacitas* potius est et odoratio quaedam venatice, quam *Scientia*” (I, 633). For Bacon’s use of hunting metaphors for the pursuit of knowledge see, e.g., *De Sapientia Veterum*, Fable 6: “Pan, or Nature,” 6: 707–14 (6: 635–41), reworked in *De Augmentis Scientiarum*, Book 2, ch. 13, “Of the Universe, according to the Fable of Pan,” 4: 318–27 (1: 521–30).

Noticing that Bacon's reference to "your Majesty" is a compliment to King James's *Daemonologie* (1577, 1603), Merchant used this fact to implicate Bacon in witch-hunting, but without paying proper regard to context and meaning. As so often, Bacon was urging that the boundaries of natural philosophy should be widened, to include study of the "superstitious narratives of sorceries, witchcrafts, charms, dreams, divinations, and the like," the "supernatural arts," as we might call them, which were generally overlooked by contemporary Aristotelianism. Although condemning "the use and practice of such arts," Bacon argues that since we do not yet know to what degree "effects attributed to superstition participate in natural causes," then it is legitimate to study them. Such a study would allow us to make "a true judgment of the offences of persons charged with such practices," an enquiry which will establish their guilt or innocence, should "natural causes" be involved. Secondly, such a study may help in "the further disclosing of the secrets of nature," and it is in this context that Bacon praises James's *Daemonologie* for applying his knowledge "of religion and natural philosophy" to shed light on "these shadows." Indeed, by mentioning the possible role of "natural causes" Bacon was directly alluding to the King's book, for in his Preface James announced that he intended to investigate the "divelish artes" and to enquire "by what naturall causes they may be."²¹

Having failed to read this text attentively, Carolyn Merchant continues to assert that it "reveals James's involvement in both the torture of witches and the sexual aspects of the witch trials" (2006, p. 519). It is regrettable that, in the twenty-five years since framing this indictment, Professor Merchant has not looked more carefully at James's use of religious and philosophical arguments to defend his belief that witchcraft really existed, against the skeptical arguments of Reginald Scot and Johann Weyer.²² Also, she fails to cite any passage from James's book to justify her claim that either the King or Bacon had some prurient interest in sexually tormenting witches. James itemized the usual horrendous punishments to be inflicted on convicted witches (*Daemonologie*, pp. 76–79), but they are not of a sexual nature. Merchant's whole case rests on her sexual interpretation of Bacon's metaphor praising the King's courage in investigating the supernatural arts, despite the risks involved: "*Neither ought a man to make scruple*

²¹ *Daemonologie* (London, 1603), Sig. A₂^v, A₃^v.

²² See, e.g., Stuart Clark, "King James's *Daemonologie*: Witchcraft and Kingship," in *The Damned Art. Essays in the Literature of Witchcraft*, ed. Sydney Anglo (London: Routledge and Kegan Paul, 1977), 156–81.

of entering and penetrating into these holes and corners, when the inquisition of truth is his sole object.” Merchant continues to claim “that the strong sexual implications of [this] sentence can be interpreted in the light of the investigation of the supposed sexual crimes and practices of witches” (*Death of Nature*, pp. 168–69; 2006, p. 518), but now she openly declares that “the sexual aspects of the witch trials” include “the practice, originally condoned by James VI, of interrogating and identifying witches by sticking needles in their private parts to identify their insensible witch marks” (2006, p. 526). Whether or not James condoned that practice, nothing in Bacon’s Latin supports her indictment of his attitude to nature: “*Neque certe haesitandum de ingressu et penetratione intra huiusmodi antra et recessus*” (1: 498) is a harmless metaphor for pursuing evidence “in every nook and cranny” as we would say. This is an idea that Bacon often expressed, most obviously in *Novum Organum*, i.18.²³ It is only by giving the words “entering and penetrating” an obtrusively sexual and anatomical cast that Merchant can drag Bacon into guilt by association with whatever disgusting practices were used by the persecutors of so-called witches. Significantly, in his 1640 translation Gilbert Wats added a phrase to make Bacon’s meaning quite clear:

Neither surely ought a man to make scruple of entring and penetrating the vaults and recesses *of these Arts*, that purposeth to himself only the inquisition of Truth. . . . (*op. cit.*, p. 82; my italics)

The whole of Merchant’s association of Bacon with witch trials collapses once we realize that it derived from her misinterpreting this metaphor.

In her 1980 indictment of Bacon Merchant made the further claim that Bacon drew an analogy between the “inquisition” of nature and “the torture chamber” (p. 169), citing another passage from the same chapter of the *De Augmentis*, where Bacon describes his third recommended type of inquiry into nature, the compilation of a *Historia Mechanica*. This would permit the study of “Nature Wrought” that is, “worked upon” by man, as in “the manual arts,” traditionally below the dignity of natural philosophy. Here Bacon broke with tradition most successfully, for the Royal Society

²³ “The discoveries which have hitherto been made in the sciences are such as lie close to vulgar notions, scarcely beneath the surface. In order to penetrate into the inner and further recesses of nature, it is necessary that both notions and axioms be derived from things by a more sure and guarded way; and that a method of intellectual operation be introduced altogether better and more certain”; Spedding 4: 49–50 (1: 159); cit. Kroetge, “Methodology, Ideology, and Feminist Critiques of Science,” 353.

soon put into practice his appeal to widen the scope of natural philosophy. In Bacon's original outline of this discipline, in the *Advancement of Learning*, he pointed out that in natural philosophy it is not "the highest instances that give the securest information," but that "mean and small things" are sometimes more instructive (3: 332). Bacon argued that a properly constituted "History Mechanical" would help fulfill his overall conception of a new science which "shall be operative to the endowment and benefit of man's life," for two reasons:

For it will not only minister and suggest for the present many ingenious practices in all trades, by a connexion and transferring of the observations of one art to the use of another, when the experiences of several mysteries [trades] shall fall under the consideration of one man's mind; but further it will give a more true and real illumination concerning causes and axioms than is hitherto attained. For like as a man's disposition is never well known till he be crossed, nor Proteus ever changed shapes till he was straitened and held fast; so the passages and variations of nature cannot appear so fully in the liberty of nature, as in the trials and vexations of art. (3: 333)

The first benefit of this comparative technology, as we might call it, will be to permit the transfer of skills and processes laterally, from one *techné* to another. The second will be to provide modes of intervention in natural processes; the "trials and vexations of art" are not "mechanical devices," as Merchant supposes (*Death of Nature*, p. 169), but "experiments that disturb nature's order" from which "axioms," higher-order generalizations, can be established. Bacon is not referring to law-court trials but to the conduct of experiments, and he chose his words with care. As Peter Pesic has shown,²⁴ the Latin version does not refer to *tortura* but to *vexatio*, which we might translate as a frustration or provocation, a state in no way comparable to torture.

Despite citing Pesic's work in her recent re-indictment of Bacon, Merchant ignores his careful demonstration that "vexation" is a relatively mild word. Now she insists that "the verb 'straiten' in the seventeenth century meant 'to tighten a knot, cord, or bonds' an act that would hold a body fast as on the rollers and levers of the rack" (2006, p. 529). That is one meaning, carefully selected to make a link with the "torture chamber" she

²⁴ Op. cit. in note 4, 88–90.

imagines behind these metaphors. However, the word also had less violent meanings, such as “Confine in or force into a narrow space; hem in closely,” which the *OED* dates to the late sixteenth century. The valuable *Lexicons of Early Modern English*, a web resource which collates all English dictionaries published between 1480 and 1702, supports these milder senses, as in a citation from 1598, “to bring to a narrow passe,” or in another from 1611, “to restraine, contract, make narrow, hem in.”²⁵ Merchant’s choice of the most violent sense is proved to be erroneous by consideration of the Proteus myth that Bacon refers to, recounted in Book IV of the *Odyssey*. Menelaos, stranded on the island of Paros and desperate to know what has happened to the other Greeks in their homecomings, is told that Proteus, “the ever truthful Old Man of the Sea,” who looks after Neptune’s herds of seals, has the power to foretell the future and can answer Menelaos’ questions. However, Proteus will only do so if held fast “while he strives and struggles hard to escape,” for he has the ability to change himself into any creature on earth, also “water and magical fire. / You must hold stiffly on to him and squeeze him the harder.”²⁶ But when Proteus finally returns to his original shape, and asks Menelaos a question, then “you must give over your force and let the old man / go free, and ask him which one of the gods is angry with you.” At that point he will divulge the truth (4.351–424). And so it comes to pass, as Menelaos and his men “held stiffly on to [Proteus] with enduring spirit,” until he answered the questions (423–80). As we can already see, nothing in this story can be taken as “an analogy to the torture chamber” (*Death of Nature*, p. 169). Bacon uses the fable to describe the persistence needed in natural philosophy to follow through an experimental enquiry until a phenomenon in nature is fully understood.

Although most modern readers know this story from Homer, Bacon used Virgil, who closely imitated the *Odyssey*’s account in Book 4 of the *Georgics*.²⁷ Where the oral poet(s) had not specified the means by which Menelaos and his men held Proteus fast, the practical Roman added some realistic details. His enquirer is advised to catch Proteus “in fetters” (396: *vinclis capiendus*), “For without force he will give you no counsel, nor shall

²⁵ See <http://leme.library.utoronto.ca>

²⁶ Quotations are from *The Odyssey of Homer*, trans. and intro. Richmond Lattimore (New York: Harper & Row, 1965).

²⁷ See the excellent annotated edition by Richard Thomas, *Virgil: Georgics*, 2 vols. (Cambridge: Cambridge University Press, 1988), i.31–4, ii.201–2, 216–25. Quotations are from the Loeb translation by H. R. Fairclough, rev. G. P. Goold, *Virgil*, 2 vols. (Cambridge, Mass.: Harvard University Press, 1999), ii.247.

you bend him by prayer. With stern force and fetters make fast the captive (*vim duram et vincula capto / tende*)” (399–400). Proteus’s power to turn himself “into all wondrous shapes” (441) can only be overcome by holding him “in the grasp of hands and fetters” (*manibus vinclisque tenebis*, 405) until the “seer” (*vates*) reveals the truth. Bacon’s debt to Virgil’s version can be clearly seen in other Latin texts in which he mentioned Proteus, such as his *Parasceve* or “Preparative towards a Natural and Experimental History,” appended to the *Instauratio Magna* (1620). Here again Bacon described the “History of Arts” as being of great use to natural philosophy, because

it exhibits things in motion, and leads more directly to practice. Moreover it takes off the mask and veil from natural objects (*rebus naturalibus*), which are commonly concealed and obscured under the variety of shapes and external appearance. Finally, the vexations of art are certainly as the bonds and handcuffs (*tanquam vincula et manicae*) of Proteus, which [display]²⁸ the ultimate struggles and efforts of matter. For bodies will not be destroyed or annihilated; rather than that they will turn themselves into various forms. (4: 257)

Merchant attaches predictable significance to the Virgilian “bonds and handcuffs” here, but in her eagerness to brand Bacon as the torturer of nature she has ignored the significance of the contexts in which he used this fable.

Where other major figures of the Scientific Revolution addressed themselves to problems of motion, whether in astronomy or mechanics, Bacon’s basic orientation was to what we might call “matter theory.”²⁹ The experiments described in the *Novum Organum* and in the late “Histories” (or “Records of Enquiry”: they have no chronological dimension) are to do with matter and the range of its transformations by heat into liquid or gaseous states, processes which, he hoped, would reveal the underlying “Forms” or structures of matter. In many contexts where Bacon uses the word “nature” he refers to matter, as in that passage first quoted from the

²⁸ My translation of “*produnt*,” which Spedding reanders as “betray.” Lewis and Short translate the verb *prodo* as “To give, put or bring forth,” also “to publish, make known, report, record.” Spedding seems to have chosen the subsidiary sense, “to betray perfidiously,” which hardly seems appropriate.

²⁹ See, e.g., Graham Rees, “Matter Theory: A Unifying Factor in Bacon’s Natural Philosophy,” *Ambix* 24 (1977): 110–25.

Parasceve, or as in his extended treatment of the Proteus myth in *De Sapientia Veterum* (1609). This was a collection of thirty-one fables which Bacon ingeniously used as a popularizing vehicle for his ideas on ethics, politics, and natural philosophy. Here Proteus is taken to symbolize “*Materia*” or matter,³⁰ and Bacon first recounts the story as “the poets tell us,” taking over Virgil’s phraseology for the need to hold matter fast: “*nisi cum manicis comprehensum vinculis constringeret.*” But this treatment of the fable is of far greater significance than the metaphors it uses, for it reveals a further, religious dimension of Bacon’s natural philosophy occluded by Merchant’s attempt to align him with Jacobean torture chambers. Bacon’s concept of matter, although fluctuating between atomic and corpuscularian notions, remained firmly in the hexaemeral tradition deriving from the book of Genesis, according to which God created matter out of nothing, and made it indestructible.³¹ In the “Wisdom of the Ancients” Bacon links the detail that Proteus falls asleep at noon, in the heat of the day, with the account in Genesis of how God created the earth, “at noon: that is to say when the full and legitimate time has come for completing and bringing forth the species out of matter already duly prepared and predisposed.” He adds:

And here the story is complete, as regards Proteus free and at large with his herd. For the universe with its several species according to their ordinary frame and structure is merely the face of matter unconstrained and at liberty, with its flock of materiate creatures. Nevertheless if any skilful servant of Nature [*Naturae Minister*] 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 and finished the period; when, if the force be continued, it returns at last to itself. (6: 726)

That ingenious exegesis links the cycle of Proteus’ self-transformations with those undergone by matter, which also retains its essential nature despite

³⁰ For the Latin text see Spedding, 6: 651–52; for an English version, 6: 725–26.

³¹ See, e.g., Silvia Alejandra Manzo, “Holy writ, mythology, and the foundations of Francis Bacon’s principle of the constancy of matter,” *Early Science and Medicine* 4 (1999): 114–26.

the metamorphoses it undergoes during experiments. The analogy is easy to grasp, yet Merchant continues to misinterpret it. As Soble pointed out, “Bacon is not issuing a *normative* claim, as if urging us to bind matter to prevent it from behaving perversely,” which is Merchant’s reading³²; “he is making the *ontological* point that no amount of binding will allow us to annihilate matter” (205). In 2006 Merchant repeated her misinterpretation, now attributing to John C. Briggs “the lesson that Bacon draws from the myth turns upon the wise man’s power to chain Proteus to the rack so as to force matter ‘to extremities as if with the purpose of reducing it to nothing.’”³³ This is exactly the opposite of Bacon’s true meaning. Carolyn Merchant’s “feminist readings of [Bacon’s] rhetoric” turn out to be seriously defective, whether as intellectual history or literary criticism. She misinterpreted Bacon’s metaphors, disregarded their function in their original context, and trivialized his natural philosophy in the process.

FRANCIS BACON AND THE BIBLICAL ACCOUNT OF CREATION

The feminist historiography of science, by aligning women with nature, takes their historical subordination to men as analogous to mankind’s ability, through natural philosophy, to “dominate” nature. Since it was wrong for men to dominate women, it was also wrong for them to dominate nature. The analogy is emotive, intended to palliate women’s victimhood by arousing sympathy towards nature and hostility towards the male scientists responsible for the Scientific Revolution. But feminist historiography has failed to take proper notice of the great authority that the Bible and theology still carried in the early modern period, including natural philosophy,³⁴ and the important fact that humankind’s dominion over nature is authenticated by the Bible. In the first creation myth, set down in Book I of Genesis, we read the events of the sixth day:

24. And God said, Let the earth bring forth the living creatures . . .

26. And God said, Let us make man in our image, after our like-

³² Cf. *Death of Nature*, 171.

³³ Merchant 2006, 529, citing Briggs, *Francis Bacon and the Rhetoric of Nature* (Cambridge, Mass.: Harvard University Press, 1989), 35.

³⁴ See, e.g., Amos L. Funkenstein, *Theology and the Scientific Imagination from the Middle Ages to the Seventeenth Century* (Princeton: Princeton University Press, 1986), and Peter Harrison, *The Bible, Protestantism, and the Rise of Natural Science* (Cambridge: Cambridge University Press, 1998).

ness: and let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon earth.

27. So God created man in his own image, in the image of God created he him: male and female created he them.

28. And God blessed them and said unto them, “Be fruitful, and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth.”

Other much-cited biblical passages reiterated mankind’s legitimate dominion over creation, such as Psalm 8, thanking God for giving man this exalted position:

5. For thou hast made him a little lower than the angels, and hast crowned him with glory and honour.

6. Thou madest him to have dominion over the works of thy hands: thou hast put all things under his feet.

In his Epistle to the Hebrews (2:5–9) the apostle Paul echoed these words. Within the Christian tradition, the creation story in Genesis gave rise to a huge exegesis of the “six days’ work,” the “hexaemeral” literature, yielding many influential commentaries. Despite some differences in interpretation, for over two thousand years the exegetical tradition took Genesis 1:28 as an unexceptionable account of God’s benevolent intentions towards the human race.³⁵ But in 1977 Lynn White published an essay entitled “The Historic Roots of Our Ecologic Crisis,” in which he attributed what he described as “Western society’s ruthlessness toward nature” to the biblical foundations of “Judeo-Christian teleology.”³⁶ White took the divine injunction to “fill the earth and master it” as having given the Jewish and subsequent peoples “a license for the selfish exploitation of the environment,” an accusation much repeated by environmentalists. However, several Old Testament scholars have shown that the biblical text carries no such connotation. In Jeremy Cohen’s summary, unlike other ancient cosmologies, “Gen.1:28 places humans at the pinnacle of the world order; they are part-

³⁵ See the valuable study by Jeremy Cohen, “*Be Fertile and Increase, Fill the Earth and Master It*”: *The Ancient and Medieval Career of a Biblical Text* (Ithaca: Cornell University Press, 1989).

³⁶ Cohen, *ibid.*, p. 2, citing White’s essay in *Science* 155 (1977): 1203–7.

ners of God in his ongoing work of creation” (“Be fertile and increase,” p. 12). This was not a masculine privilege, for responsibility for the created world was given to both sexes: “Man and woman share equally in . . . the divine charge” (p. 13). The Hebrew verb for “subdue” the earth could also mean “render productive,” so that “the subdued earth is a land that serves its master productively.” The fact that the Old Testament also used this verb in connection with the Holy Land “shows that no denotation of uncontrolled or destructive exploitation appears here” (p. 17). Other biblical contexts show that Genesis 1:28 sets up a framework of mankind’s rule over the land and the creatures for the benefit of the whole, as in the injunction (Gen. 2:15) that Adam should till and preserve the garden of Eden (p. 18). Having shown that modern theologians, without exception, legitimize the notion of dominion, Cohen then surveyed the early Jewish commentators, who saw in Gen 1:28 further evidence of God’s covenant with mankind. According to midrashic interpretation, the Bible appropriated “God’s blessing of all humankind with fertility and dominion in order to define an exclusive relationship between God and his chosen people” (p. 66). Patristic commentators, although not envisaging a special role for Israel, placed a similar emphasis on God’s benevolent purpose in endowing human beings with the divine image and “extensive power” over creation (pp. 226–27). Rightly interpreted, Gen. 1:28 does not endorse man’s irresponsible exploitation of the earth: as Cohen quietly puts it, “the ecologically oriented thesis of Lynn White and others can now be laid to rest” (p. 5).

In his early Calvin-inspired work, *A Confession of Faith* (before 1603), Bacon gave a purely theological account of Christ’s sacrifice to redeem us through grace, with no role either for good works or for mankind’s application of their God-given abilities.³⁷ But as he developed his distinctive scheme for a “Grand Instauration,” Bacon ascribed to natural philosophy a redemptive, transformatory role, in which human effort does not usurp divine grace but complements it. The feminist opponents of science have not noticed that, for Bacon, mankind’s “dominion over nature” had both a theological and a philanthropic dimension.

Perez Zagorin has suggested that the biblical phrase “the Kingdom of Man” used in the subtitle of the *Novum Organum* (1620), appeared there “for the first time in Bacon’s writings” (*Francis Bacon*, p. 78). In truth, however, several works which Spedding classified as “originally designed for parts of the *Instauration Magna* but superseded or abandoned” (3: vii),

³⁷ See Spedding, 7: 215–26.

recur to this notion of mankind's legitimate dominion over nature. A tract which Spedding assigns to 1608 (but other scholars to 1603) has the title *Temporis Partis Masculus, sive Instauration Magna Imperii Humani in Universum*.³⁸ This "Masculine Birth of Time" takes the form of an address to a young student by an older man who describes his sole earthly wish, "to stretch the deplorably narrow limits of man's dominion over the universe to their promised bounds" (tr. Farrington, p. 62; 3: 528). In this treatise Bacon defined two worthy forms of human ambition, of which the "nobler and holier" is the endeavor "to restore and exalt the power and dominion of man himself, of the human race, over the universe. Now the dominion of man over nature rests only on knowledge. His power of action is limited to what he knows. No force avails to break the chain of natural causation. Nature cannot be conquered but by obeying her" (pp. 92–3; 3: 611) anticipating ideas given final form in the *Novum Organum*. In *Redargutio Philosophiarum*,³⁹ a polemical work written in about 1608, Bacon called for a natural philosophy that would benefit mankind:

Let us establish a chaste and lawful marriage between Mind and Nature, with the divine mercy as brideswoman. And let us pray God, the father of men and nature . . . that from that marriage may issue . . . wholesome and useful inventions to war against our human necessities and, so far as may be, to bring relief therefrom. Let this be our prayer at the consummation of this rite. (p. 131; 3: 583)

This "lawful marriage between Mind and Nature" is one of many metaphors that Bacon took from marriage to describe his goal of creating a natural philosophy which would put mankind back in harmonious exchange with nature.⁴⁰ (If ecologists wanted a father-figure, Bacon's reverence for nature, and great love of gardens, would make him a strong candidate.) Bacon expressed his philanthropic vision for science in another

³⁸ See Spedding, 7: 521–39. The translation quoted is by Benjamin Farrington, *The Philosophy of Francis Bacon. An Essay on its Development from 1603 to 1609 with New Translations of Fundamental Texts* (Liverpool: Liverpool University Press, 1964), 59–72.

³⁹ Spedding, 3: 557–85; Farrington's translation, 103–33.

⁴⁰ See Walter R. Davis, "The Imagery of Bacon's Late Work," *Modern Language Quarterly* 27 (1966): 162–73. It is ironic that, in describing her intellectual development, Carolyn Merchant fails to see that her position, even with its avoidance of the concepts of "marriage" or "wife," is actually very close to Bacon's: "This led me to articulate an ethic of partnership with nature in which nature was no longer symbolized as mother, virgin, or witch but instead as an active partner with humanity" (2006, 515).

of these transitional works, *Valerius Terminus of the Interpretation of Nature*, where he defended the legitimacy of “digging further and further into the mine of natural knowledge” as an activity which would have redemptive consequences, if only humankind would dedicate itself to “that use for which God hath granted” it knowledge, namely “the benefit and relief of the state and society of man” (221–22). Then they would recognize that the true end of knowledge

is a restitution and reinvesting (in great part) of man to the sovereignty and power . . . which he had in his first state of creation. And to speak plainly and clearly, it is a discovery of all operations and possibilities of operations from immortality (if it were possible) to the meanest mechanical practice. (3: 222)

Although conceding that mankind is still subject to the two consequences of the Fall, the loss of power over “the creature” and the need to work, Bacon affirms his belief that “there remaineth at this day a world of inventions and sciences unknown” (223) that could yet transform human life.

Bacon’s personal choice to pursue a *vita activa*, and his intense involvement in law, politics, and government throughout the first two decades of James’s reign, left him little time for natural philosophy, and it is not until he hastily assembled the various treatises which form the torso of his *Instauratio Magna* (1620) that his concept of natural philosophy as having the power to mitigate the divine curse on mankind emerges fully. The opening words of the *Prooemium* to his “Great Instauration” introduced the metaphor of a “*commercium*,” an “exchange” between the human mind and nature which might be restored through natural philosophy. He urged that

all trial should be made, whether that commerce between the mind of man and the nature of things . . . might by any means be restored to its perfect and original condition, or if that may not be, yet reduced to a better condition than that in which it now is. (4: 7)

The notion of regaining our prelapsarian dominion over nature was clearly in his mind while writing the *Novum Organum*. As Zagorin noted, its subtitle is “Aphorisms concerning the Interpretation of Nature and the Kingdom of Man” (4: 47), “*Regno Hominis*” (1: 157). Bacon’s most complete statement of the redemptive capacity of his reformed natural philosophy is

found, fittingly enough, in the final aphorism of Book II. Here he sums up his new logic, which, unlike scholastic logic, is not concerned with “abstract notions” but constitutes an operative science, one that “may in very truth dissect nature, and discover the virtues and actions of bodies, with their laws as determined in matter; so that this science flows not merely from the nature of the mind but also from the nature of things . . .” (4: 247). And so Bacon bequeathes us his new science, in order that

at length (like an honest and faithful guardian) I may hand over to men their fortunes, now their understanding is emancipated and come as it were of age; whence there cannot but follow an improvement in man’s estate, and an enlargement of his power over nature. For man by the Fall fell at the same time from his state of innocence and from his dominion over creation. Both of these losses however can even in this life be in some part repaired; the former by religion and faith, the latter by arts and sciences. For creation was not by the curse made altogether and for ever a rebel, but in virtue of that charter “In the sweat of thy face shalt thou eat bread,” it is now by various labours (not certainly by disputations or idle magical ceremonies, but by various labours) at length and in some measure subdued to the supplying of man with bread; that is, to the uses of human life. (4: 247–48)

In the context of Bacon’s natural philosophy mankind’s dominion over nature had none of the destructive connotations ascribed to it by the *ressentiment* of a “feminist historiography of science.” It carried the promise of restoring God’s original blessing on Adam and Eve, undoing their original sin, and offering a significant amelioration of humanity’s life on earth. Science has certainly achieved some of his goals, if at times with unexpectedly negative consequences which neither he nor anyone else predicted, and for which he cannot be blamed. His legacy remains an inspiring tribute to the power of the human intellect.

Although some ecofeminists and environmentalists may still continue to scapegoat Bacon as the source of all our ills, it seems unlikely that historians of science will lend any credibility to an indictment based on so little evidence, so poorly understood.

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