

Francis Bacon, Robert Burton, and the Thick Skin of the World: Sympathy, Transmission, and the Imaginary Early Modern Skin

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READING Early Modern Skin

In *Skin: On the Cultural Border Between Self and World*, Claudia Benthien offers a history of skin as “the central metaphor for separateness,” arguing that it is only at the boundary of the bodily integument that subjects are able to “encounter one other” (1). That the skin is or has been at various periods in Western history “the place where boundary negotiations take place” is indisputable; what constitutes the skin object and whether or not the skin has always been the site of boundary negotiations between bodies is a matter of greater historical complexity (xi). Benthien follows Didier Anzieu’s reasoning that since the Renaissance, Western epistemology (modeled on the “penetration and uncovering” of bodies in Vesalian anatomy) has been predicated on the notion that “knowledge of what is essential means breaking through shells and walls in order to reach the core that lies in the innermost depths” (7). According to Benthien, it is only recently, with the development of modern psychoanalytic and medical discourse, that we have come to recognize the skin’s ontological destabilization of the body’s “inside” and “out.” Echoing Anzieu, Benthien writes that neurophysiology “has had to come to terms with the paradox that even the brain is a rind—and the human ‘center’ is actually situated

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at the periphery” (7). While I am sympathetic to Benthien’s project, I take issue with the version of the skin to which she compares post-Renaissance ontologies of the body’s surface. Benthien writes that in the pre-modern period skin “still constituted a structurally impenetrable boundary to the invisible and mysterious inside” (10). I aim to show that what Benthien regards as the modern re/invention of the skin as a porous ontological interface between bodies and subjects is forcefully present in early modern natural philosophy, medicine, and science. It goes, however, by different names and describes different functions than those we attribute to skin.

The challenge of writing about skin, especially but not exclusively in the early modern period, is that it requires study of the representations of encounter and communication that pertain to a wide territory of the body’s surface sometimes referred to by the word skin, or its synonyms, but very often is not. The fact that the skin is not described as a concrete and stable object in the early modern period indicates precisely how fluid early modern ideas of the skin were. A relative dearth of references to the skin proper in late Renaissance depictions of the body has compelled literary historians to look for the skin in the “elsewhere” of analogy, allegory, and, of course, the history of touch.¹ My approach to reading skin works in two ways. It works backward, approximating a meaning for earlier models of skin by looking in the places we expect to find it, namely at the border or boundary between bodies, and discovering something far more fluid in its place. Second, I study the illocutionary as well as articulated representations of skin-like encounters and surfaces.

I use these methods to offer a reading of two very different early modern writers, both of whom have been singled out by historians of the body as iconic figures: one of anxious bodily indeterminacy and the other of the rationalist orientation of early scientific empiricism. My subjects are Robert Burton and Francis Bacon and the texts that were published within four years of one another, Burton’s *The Anatomy of Melancholy* and Bacon’s posthumously published natural history *Sylva Sylvarum* and the fictional utopia *New Atlantis*, to which it was appended. My interest in these texts is not in their named references to the skin (of which there are far fewer than we might expect) but rather to their depictions of bodily encounter and intercorporeal influence, so that we might discover what role, if any, the body’s surface played in negotiating the relationship between bodies.

This investigation is centrally concerned with early modern representations of the skin as a zone of encounter, not between opposed, solid,

¹ See Harvey’s *Sensible Touch*.

and impermeable skins but precisely between “skins” understood in the early modern period as membranous conduits between an indeterminate “inside” and “outside” of the body. The argument, in short, is that historians have vastly underestimated the “thickness” of early modern skin. Despite their starkly opposed teloi, aesthetics, and, as I will argue, ethics, Robert Burton and Francis Bacon both offer a view of the skin as plural, composite, and membranous.

I recognize that I am reading these authors against the grain of contemporary scholarship. Burton’s centonic (and frequently vitriolic) recitations from classical and contemporary sources incriminating women, actors, lovers, effeminate men, social climbers, orators, and scholars have been typically read without an eye and ear to the ironies of his rhetorical performance.² Critics have generally overlooked the relationship between these copious citations and the means of their delivery through the arrogated persona of Democritus Junior. Burton has consequently been singled out as an icon of late Renaissance anxious masculinity defending against the pervasive threat of bodily penetration to which all bodies were subject in a Galenic paradigm.³ By illustrating how Burton can be read to reveal pleasure in the porosity of the body and the indeterminacy of the “surface,” I suggest that our readings of skin, surfaces, and zones of bodily contact in other key late Renaissance texts could be usefully reviewed and revised.⁴

The first difference I wish to point out between modern definitions of skin and the semantic range of skin representations in the early modern period is in number. Modern English refers to the skin as a single surface; we tend not to speak of the skin as a complex of skins. While the Greek and Latinate medical terms (*derma* and *cutae*) describe layers of skin, modern English has all but completely lost its earlier sense of thickness—that there are skins beneath skins and skins *inside* the body. In early modern physiology, the word “skin” was not used to denote the enclosure of the body so much as parts within it. The organs inside the body were described as being cased in skins. Skin referred to tissues in the brain, chest, or wrapping the heart; indeed, the word tissue is a synonym for skin in early modern medical treatises.

2 Burton’s histrionic performance in *The Anatomy* was regarded by most twentieth-century readers as the psychological sign of the author’s own manic disease (Evans, Nochimson). For a more recent reading of *The Anatomy* as “anxious performance” see Tilmouth.

3 See, especially, Breitenberg’s *Anxious Masculinites*.

4 For the full version of this argument see Shirilan, “The Pleasures of Mimetic Sympathy in Robert Burton’s *The Anatomy of Melancholy*.” PHD diss. Brandeis, 2009.

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In Helkiah Crooke's *Microcosmographia* (1615), the skin has equally important retaining and transmissive functions: it both "knitteth the whole body together" and is punctured throughout by large *foramina* or orifices and an infinite number of small pores: "It is an unseamed garment covering the whole bodie, yet hath it certaine breaches made by Nature for her ease and reliefe" (72). Crooke identifies three principle layers of skin: uppermost is the (creamy) cuticle, then the "scarfe-skin," and lastly the "true and genuine skin." However, this "true" skin is belied by its own etymology. True skin does not indicate an object arrived at after stripping away the surface. Rather, as Crooke notes, the Greeks called this true skin *dermis* precisely "because it may be excoriated or flayed off" (71). Indeed, if the true skin is stripped of its cuticle, it "cannot distinguish between one Temper and another; because the very gentlest touch of the bared skin breedeth paine, and the sensation is confused" (71). The tactile senses, which translate the experience of proximity and contiguity to the external world, are housed in the upper or "superficial" as opposed to the submerged or "actual" skin.

The complex of skins may be exceedingly thick and exquisitely fine. Crooke remarks that while it is only with great pain removed from the flesh, the skin itself is moveable. He gives the exotic example of the elephant that "can by the corrugation or wrinkling of his skinne, kill the flies that molest him" (72). If the skin is of indefinite thickness, and can be so rare as to be transparent to the blush of flesh under the lips or so thick as to enable the elephant to crush its pestering mosquitoes with a mere twitch, how can we say with certainty where the skin becomes part of the flesh or where it becomes so rare as to be indistinguishable from the atmosphere or from the bodies of others? What ontology of the surface can we approximate from the semantic range of skin in the early modern period?

In the corpus of medical and scientific prose of the early seventeenth century, the word *superficies* is a frequently occurring synonym for skin. *The Oxford English Dictionary* defines the *superficies* as the "outer surface of a body, which is apparent to the eye, or is immediately adjacent to the air or to another body." *Superficies* emphasizes spatial contiguity. It is the most extreme or rarified layer of the skin as a point of contact, as opposed to separation, and it emphasizes the *immediacy* of the skin to the proximate object, of which a further word or two is necessary. Much of the recent scholarship on early modern skin has come by way of historicizing the sense of touch. As Elizabeth Harvey notes, early modern writers echoed the classical notion that touch was the sense of all senses and that, as the presumed organ of touch, the skin had a privileged, if problematic, place

in the hierarchy of the sensory apparatus.⁵ Of the five external senses, touch was regarded as the most immediate. Unlike the ear and eye that depend upon the inner senses to “make sense” of perceptions, the organ of touch has no medium. Crooke illustrates with the example that one cannot read by applying a book directly to the eye (71). Carla Mazzio asks in her study of “tact” and touching, “[H]ow does one account for a sense without a medium? What happens to this ‘unmediated’ sense in early medical and contemporary theoretical accounts of representation that look to the ‘medium as the message?’” (166–67). Mazzio notes that it is unsurprising that such messages would become difficult to decode or even detect. More difficult still, I would add, if the messages are diffused across a surface that is neither a single organ but an entirely permeable membrane of indeterminate thickness and breadth. In this semantic flux, representations and meanings for skin have been both overdetermined by modern readers and have slipped under the radar.

The dominant position amongst contemporary historians of the body is that porosity posed a threat to the integrity of the early modern body. The softer, more porous bodies of women made them more vulnerable to impression, as was evidenced by the expectant mother’s ability to transmit images and information perceived from outside her body to the entirely impressionable surface of her unborn child. As Nancy Caciola has illustrated, the porosity of the female body likewise made women more vulnerable to demon possession. But the same porosity that made a woman’s body more vulnerable to demonic influence also made her more open to divine and spiritual inhabitation.⁶ Studies of bodily openness and porosity in the early modern period have concentrated mainly on the vulnerability of the body as the recipient of impression, overlooking the bidirectionality of influence implied by its porosity. This analysis ignores the expressive function of the body’s execratory influence, that is, of the information transmitted or expelled by the leaky body into a pneumatic atmosphere that connects all bodies.

Renaissance medicine sought to ensure the body’s unobstructed passage of internal fluids through ports of egress. Recent analyses of the orificiality of the body remain concerned with the vulnerability associated

5 This paper is particularly indebted to Elizabeth Harvey’s account of the skin as “the touching organ,” which she offers in complication—and extension—of Anzieu’s model. Harvey suggests that the skin “provides a more complex border between inside and outside [...] that emphasizes the shifting, dynamic relation between the two” (85).

6 See chapter 3, “Fallen Women, Fallen Angels,” in Caciola’s *Discerning Spirits: Divine and Demonic Possession in the Middle Ages*.

with these sites of interaction between the body and the external world. “Solubility,” writes Gail Kern Paster, “was a function of internal and external economies potentially fraught with peril” (9).⁷ Michael Schoenfeldt has attempted to qualify the “anxious reading” of early modern porosity by remarking upon the regimen of care associated with regulating as opposed to sealing the pores and orifices, attending vigilantly to what goes in and out of them: for example, the quality and kind of food taken, fetishistic care and attention to the frequency and properties of excretion, etc. This provocative work continues, however, to cast a view of the relationship between the interior and exterior of the body as perilous. And in this view, the skin continues to be regarded as the battered precipice between the self and not-self. In turning to Robert Burton, I wish to emphasize the ways in which the porosity of early modern skin betokened not only healthful commerce with the external world but allowed for an ecstatic fluidity of the body that underpinned an ethics of permeability and influence.

Burton’s Thin Skins

In the preface to *The Anatomy of Melancholy*, Robert Burton compares his book to the legendary drum of Captain John Zisca, who, according to legend, requested that his skin be made into a drum after his death so that with the strike of it he would continue to ward off his enemies as he had on the battlefields. Burton hopes that the reading as well as the writing of *The Anatomy* (which Burton says he undertook “by being busie to avoid Melancholy”) will have medicinal value—warding off melancholy in the sounding out of its passages (1:6).⁸ The comparison to Zisca’s skin drum here at the outset of *The Anatomy* begs us to dwell on the surface or skin of the text as a speaking instrument whose voice is only made audible through the reader’s direct contact with it. The drum yields its percussion to the impact between skins; the reader, as percussor, releases the skinned voice of the author.

Likening skin to language, or, more specifically, the parchment or paper text to the lined surface of the body, is hardly a novel trope. Steven Connor reminds that the production of books (both in the surface onto which words are inscribed and with the textiles that are used to bind them) has always depended on the use of skins. Connor describes how bookmakers

7 Paster’s *The Body Embarrassed* examines the tensions between early modern medical emphasis on the necessity of humoral evacuation, even “somatic uncontrol,” and competing emergent disciplines of self-mastery (14).

8 All references to *The Anatomy of Melancholy* are taken from the Clarendon edition and are cited parenthetically in the text indicating volume and page.

throughout modern history have played on this trope by making meta-texts of and on skin. He gives examples of medical and dermatological texts made of skin: of hanged criminals whose tanned skins bind their own execution reports, and of lovers who bequeath their skins in books of poems to their beloved (42–45). Still, the resistance and tension of the drum's taut skin is a strange metaphor for *The Anatomy*, which, like the porous tissue of living skin, is less a solid surface than an organ that gives and admits influence.

Burton's *Anatomy* is above all an experiment in citation. As librarian at Christ Church, Burton spent thirty years redacting from the late humanist library on the vast subject of melancholy. He calls his book a cento, a patchwork cloth sewn together from diverse sources. The centonist's art is in brandishing its influences as textile fragments out of which an aesthetic object prized for the skill of its weaving is fashioned. A cento is a surface made up of surfaces, and imperfectly if not subversively so.⁹ The pleasure of the cento is in making something new out of borrowed tags originally intended for very different purposes. Ausonius's *Cento Nuptialis* "rips" from the *Aeneid* to narrate a wedding story that moves from pageantry to pornography, artfully rearranging Virgilian depictions of the bloody battlefield and the fluidity of the epic landscape to describe how the blushing bride is terrorized by her brutal deflowering. The playfulness of the cento, which Ausonius describes as a game, represents the master text as a scissile surface and in so doing suggests that the authority vested in the master text is only skin deep. Of course, this clichéd expression itself ironizes the surficiality of skin by making skin the ur-sign not merely of shallowness but of the unstable value associated with objects of inscrutable depth.

The skin that takes precedence in *The Anatomy of Melancholy* is not the outside or diagnostic surface of the body so much as the thin skin of the melancholiac that bespeaks his impressionability and openness to the receipt of influence. On the heels of his invocation of Zisca's skin drum, Burton warns that reading the detailed descriptions of the cases studied within his book could worsen the symptoms of a melancholic reader who "by applying that which he reads to himself, aggravating and appropriating things generally spoken, to his own person (as melancholy men for the most part do)" is wont to experience these described conditions secondarily (1:24). Burton's melancholiac—most especially the hypochondriacal

9 On the medieval cento see Mary and Richard Rouse; on the subversiveness of the cento see Bakhtin (68). Verweyen and Wittig comment on the absence of critical attention to the form (172).

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melancholiac—is marked by this primary disposition to assimilate external phenomena, and the experiences of other bodies, as his or her own.

In Burton's account, this "hypochondriacal" transmission takes place through the "force of the imagination." By setting the stage for *The Anatomy* with Zisca and his skin drum, Burton highlights the bidirectionality of influence admitted by the skin and the imaginative faculties.

If studying the early modern body requires an undoing of modern assumptions, the first assumption that needs undoing is that the imagination signifies the unreal. The schematics of the imagination as a system comprising bodily organs and networks had been mapped by the ancients and revised throughout the medieval period to reflect varying positions on the passivity or agency of the senses in perception and cognition.¹⁰ The imaginative faculty was regarded as the machinery for the production of conceits that were, according to Burton, indistinguishable from any objective or external reality. Burton insists on the physiological verifiability of hypochondriacal conceit as evidenced by the measurable, empirical signs of distress it displays. He gives the example of a man who will cross a plank laid over flat ground easily, but asked to walk the same plank in darkness and told he is crossing deep water, the same man turns pale and sweats, his heart races, "*hee is vehemently moved, and 'tis nothing but his imagination ... to which his other members and faculties obey*" (1:420). This tag, "nothing but his imagination," does not diminish the force of the imagination but, rather, underscores its potency.

Burton is precisely interested in the capacity of the imagination to reinterpret perceived reality in ways independent of and even contradictory to "outward causes." He is compelled by the ease with which the body communicates physiological experiences by means of mimetic performance. The curious ways in which we give or catch a yawn and clench our jaws at the thought of sourness or the sound of a scraped plate illustrate the capacity by which humans transfer somatic experience: "Why doth one man's yawning, make another yawn? One mans pissing provoke a second many times to doe the like? Why doth scraping of trenchers offend a third, or hacking of flies?" (1:254). The performed symptom infects the perceiver with the impulse to reproduce the observed behaviour—regardless of the authenticity of this witnessed performance. The infectiousness of performed bodily impulses serves Burton as proof of the body's capacity to be moved to involuntarily mimic other bodies, and not only by visual

¹⁰ See Pasnau; E. R. Harvey; Spruit.

witness or conscious observation but exposure to a pneumatic medium that connects all bodies.

Burton's quotidian examples of somatic transference illustrate the mechanics whereby bodies communicate sympathetically across distances. The contagion of a yawn or itch illustrates the continuum between familiar and more exotic, occult examples of the force of the imagination, of which Burton gives the standard cases: corpses that bleed in the presence of their murderers, the "fascination of children by witches," powers of telekinesis and of the ability to change the weather. Compared with less spectacular examples of sympathetic transference, these phenomena are deemed occult because of the lesser distance between the agent and the body acted upon. The distance between bodies, however, is not a void. The occult, here, is merely an extension of the order of sympathy underwriting an animate, materialist cosmology that makes the homeo and allopathic treatments of sympathetic medicine "work."¹¹ My purpose here is not to enter the long historical debate over the nebulous line between sympathetic magic and medicine but, rather, to illustrate that the notion of a hermetically sealed body and of the skin as a finite boundary is inimical to the cosmology of sympathy, wherein all bodies communicate with one another through a medium animated by spirit or pneuma.

The anxiety-of-bodily-influence argument, which has dominated literary histories of the body for more than a decade, has yet to contend seriously with the materialist underpinnings of Renaissance philosophies and physiologies of perception and cognition.¹² Proponents of this argument have therefore overlooked evidence that according to early-modern cognitive psychology, learning and study required a body to be open to impression. In his history of the debate over the doctrine of the intelligible species, Leen Spruit describes the Epicurean contribution to a materialist physiology of perception. According to Epicurus, "All knowledge derives from sensation, which originates in the *eidola* effluent from external objects and impinging on sense organs." These *eidola* are "clusters of atoms—a sort of 'skins' released from the surface of material objects." In Epicurus' analogy, skin designates a residue or peel that detaches itself

11 For general background on the occult in early modern science see Vickers; Shumaker; Thorndike.

12 As John Sutton and Mary Crane have observed, studies of the materiality of early modern faculty psychology have lagged significantly behind those on the materiality of humoral theory (see Paster and Siraisi). See Sutton's *Philosophy and Memory Traces* and his contribution to *Environment and Embodiment in Early Modern England*.

from a body, collides with, and travels into other bodies. According to Epicurus, learning consists of the atomic collision of bodies coming into contact with the skins of other bodies. The Stoic model of perception, to which late Renaissance physiologists were particularly indebted, emphasizes the circulatory and recursive exchange of sensory perception. When a stream or “current” of *pneuma* travels from the soul to the sense organ, it leaves the body and enters the pneumatic atmosphere where it is altered before eventually returning to deposit a sensory image or *phantasia* in the mind (Spruit 55).

Despite the intense and controversial break from Galenic medicine in the Paracelsian or chemical revolution, a sympathetic logic mediating the body’s relationship with the pneumatic atmosphere is common to both.¹³ Galen regarded disease as emanating from internal imbalance which required regulating treatment—usually but not exclusively by means of opening and release (leaching, bleeding, cupping, purging, and enemas). Paracelsian medicine replaced the humoral principles with chemical principles tied to celestial influences with which the body was to be brought into harmony from the outside. In both models, homeopathic and allopathic techniques roused or subdued the humours through exposure to like or unlike substances. According to both models, the forces of sympathetic attraction (and antipathetic repulsion) work *through* bodies—they cannot be insolubly constrained by the body’s highly porous surface. A body cannot maintain its discreteness from other bodies, animate or inanimate, by virtue of its possession of an integument or skin.

It was, of course, a commonplace of the Christian *memento mori* to remind that we are all dust bound and “of the worm.” But this sentiment expressed the sympathetic entropy of the living as well as the dying body. The early modern body did not begin and end at the skin. It left both gross and subtle residue in its wake: fine traces in the vapours it emitted, more substantial ones in the protuberance and excrescence of nail, hair, callous, warts, and teeth that grew from and fell off the body. Urine and feces were routinely studied not merely as symbolic indices of the body’s health but as material effluxions of internal humours and spirits—as were the blood, semen, sweat, and spittle.¹⁴ The material reach of the body extended well beyond its ever-changing carapace into a pneumatic atmosphere that abutted, abraded, and perforated all bodily surfaces or skins.

13 On the chemical revolution and the Paracelsian rejection of Galenism, see Debus and Pagel.

14 See Beier; Siraisi; Wear.

Insofar as the early modern skin housed the sensory apparatus, it indeed represented a localized point of encounter between the inside and outside of the body. I emphasize the contingency of this statement because in the late Renaissance the body's surface was regarded as being so porous and subordinate to the forces of sympathy and the imagination as to be nearly erased by them. One might say that if the Freudian body is wrapped in a skin ego, the body as it was understood by late Renaissance physiology had a far more virtual container; the imagination, not the epidermis, regulated the unstable relation between the body's inside and outside.

Bacon's Missing Skin

Published a year after his death and only four years after the first edition of *The Anatomy of Melancholy*, Bacon's *Sylva Sylvarum: Or a Natural History in Ten Centuries* together with its appended utopian fragment *New Atlantis* offer surprising views of the role of the imagination in the physiology of perception. While the entire manuscript is concerned with the study of matters invisible, the tenth century or chapter of *Sylva Sylvarum* takes up the problem and power of the imagination specifically. Bacon begins the tenth century with a radical rejection of all superstition regarding the *spiritus mundi* and the role of man as its microcosmic correlative. He pledges to "inquire with all sobriety and severity, whether there be to be found in the footsteps of nature, any such transmission and influx of immaterial virtues; and what the force of imagination is" (641).¹⁵ By "immaterial virtues," Bacon means the spirits or pneumatics—tiny material bodies, which he defines as "nothing else but a natural body, rarified to a proportion" (381). These spirits take the place, in Bacon's cosmology, of the Peripatetic *species* or Epicurean *eidola*.

Bacon follows in the Epicurean tradition of allocating a skin-like function to the infinitesimal bodies that animate the senses and transmit information. These spirits are the subtlest material parts "included in the tangible parts of bodies, as in an integument" (381). According to Bacon, there are two types of spirits found in bodies: inanimate and vital spirits. The simple distinction between these is that retention of inanimate spirit is harmful to the body, whereas retention of vital spirit preserves health and prolongs life. However, Bacon writes relatively little about the vital spirits and rarely distinguishes them by name from the inanimate variety. It is frequently only a matter of context that determines to which variety

15 All references to *Sylva Sylvarum* are taken from the 1857 Spedding edition.

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of spirit Bacon is referring.¹⁶ In his *de viis mortis*, Bacon explains that the vital spirit is superadded to the inanimate spirit and does not replace or overwrite the functions and operations proper to them but, rather, “reduces them to order” (165). This is especially the case in animals possessing “branching” vital spirits and a “central ventricle” or brain that organizes motor functions (35).

Bacon’s distinction between vital and branching spirits on the grounds that one is sensible and the other insensible is a tenuous one, and one that furthermore undermines the distinction between sensibility and the powers of perception pertaining to all bodies. According to Bacon, all spirits, and consequently all bodies, possess discriminating powers of perception. All bodies, both tangible and intangible, contain spirits, and these spirits move (or seek to move) in accordance with the principles of sympathy—inclining and “embrac[ing] that which is agreeable,” recoiling from and expelling “that which is ingrate” (602). This perceptual and discriminatory capacity of insensible matter is what keeps the material world from dissolving into a chaos of the same. “Perception precedeth operation,” he says, “for else all bodies would be alike to one another” (602).

The physical integrity of bodies and the question of what prevents a body from dissipating under the pressure of similitude is a key concern of *Sylva Sylvarum*. However, what we find in Bacon’s experiments is less a preoccupation with policing the discreteness of bodies (and protecting the individual body from transformative influences) than Bacon’s fascination with the means by which the body may be altered and enhanced, its entropy forestalled or accelerated. The experiments of *Sylva Sylvarum* are chiefly concerned with the prolongation of life, not by sealing the body but by protecting it from putrefaction. Precisely because the spirits seek to bond sympathetically with like bodies, the character of the ambient air surrounding a body, namely that it is dissimilar from the body to be preserved, is of utmost importance to its preservation. Bacon writes that if one wishes to prevent corruption one must ensure that “the body adjacent and ambient be not commaterial, but merely heterogeneal towards the body that is to be preserved; for if nothing can be received by the one, nothing can issue from the other” (589).

As there are no voids in Baconian nature, only antipathy can (temporarily) stay the desire of inanimate spirits to exit the body and merge with the air with which it is elementally sympathetic. While Bacon mentions

16 Graham Rees notes the indistinctness of the two forms of spirit as evidence that Bacon regarded vital spirits as the more subtle rarefaction of inanimate spirits, that the two forms of spirit were not in essence opposed but continuous (43).

the possibility that painting and anointing the body has the potential to delay aging by restraining the emission of the vital spirits, there is little interest in his writing with the hermetic encapsulation of the body in a rigid, impervious skin. In fact, the integrity of the body (the degree to which it is prevented from assimilating into other bodies) depends upon its flexibility. Bacon defines fragility as an “impotency to be extended” (616). There is an unexpected reasoning here that contradicts modern sensibilities: a body retains its shape and character in relation to the degree that it can be extended. This extension depends upon a body’s ability to yield its spirits, which it is able to do in proportion to the degree that it possesses them in abundance, “for it is the spirit that furthereth the extention or dilatation of bodies, and it is ever concomitant with porosity” (616). The more porous and extensible the surface, the stronger the body (a lesson we know from observed physical experiments but have assumed to be irrelevant to early modern notions of embodied selfhood).

That Baconian science announces itself as a radical break from the humanist model of natural philosophy—a model Bacon rejected primarily because it relied on received as opposed to demonstrated knowledge—is certain. My point here is to challenge the assumption that Bacon’s program for an empirical science was based on the negation of the powers of the imagination. To the contrary, I wish to illustrate how deeply interested he was in the physics by which bodies communicate through “invisible” realms.¹⁷ I begin by noting that Bacon’s empirical method of trial and experimentation was itself conceived in terms of fundamentally skin-like scenes of encounter. His aphoristic definition of wonder as “broken knowledge” can be interpreted in various ways depending on what one makes of the implied rupture and the epistemological value of the intact object or, more to our purposes, the intact skin.

As Amy Boesky reminds, many critics have noted the “unfinished quality” of Bacon’s writing. The aesthetic of the experiment, especially in the inductive framework where an experiment may be tested indefinitely, is necessarily an incomplete one. Boesky suggests that “an attraction to the fragmentary or incomplete may explain Bacon’s delight in aphorisms”—the form whose “brokenness” imitates the incompleteness of human knowledge and which Bacon says he chose specifically in order to “invite men to inquire further” (66). If knowledge were a closed, perfect body, there would be no way in. Its brokenness is a fortunate thing, a *felix culpa*. And if

17 On the belated critical appreciation of Bacon’s so-called speculative philosophy see Peltonen and Rees.

the incompleteness of knowledge allows for human inquiry, the openness of the body of nature provides its material, not necessarily by penetrative incursion but precisely at the point of contact between the known or unknown—a point of contact indexed by the thick surface or, to use Merleau-Ponty’s term, the “thick skin” of the world.

In drawing attention to a congenial view of porosity of the body and, indeed, of the “surface” *qua* surface (that is, the surface as a telos or object of inquiry in its own right), my reading may seem to be contradicted by Bacon’s language of penetrating inquiry, the plummeting eradication of superstition, and even his much-quoted definition of wonder as “broken knowledge.” The language of forced entry and rupture in Bacon’s work has received much attention from feminist and eco-critics following Carolyn Merchant.¹⁸ I suggest, however, that the language assumed to represent sexual or genital penetration in early scientific discourse might have its origin in a more generalized orificial economy and language of the pores, which were regarded as smaller, infinite orifices or foramina (which carries the Latin sense of aperture, fissure, and perforation as opposed to organ specific orificiality). So when Bacon writes that the new order of scientific research demands that we “not make scruple of entering and penetrating into these holes and corners” of nature, we may be mistaking a representation of the foraminous or a multiply perforated body for a misogynistic or pederastic injunction to exert domination through sexual penetration.¹⁹

As Merchant notes, the utopian scientists in Bacon’s *New Atlantis* burrow into caves “sunk six hundred fathom” deep into the earth where “coagulations, indurations, refrigerations, and conservations of bodies” are studied and attempted. But this mining and the penetrative gaze Merchant associates with it are symmetrically reversed in the very next sentence with the description of “towers half a mile in height” (177).²⁰ Mysterious arts of insulation and preservation are practised in the rarified and elevated air, miles above the earth’s surface. If Bacon’s *scientia* requires the breaking or rupturing of a hymenal surface of the earth, it’s a very thick one indeed—one that plummets deeper than the Atlanteans can dig and extends as high as they can climb. The object of science in *New*

18 See, especially, Keller and Harding. Of note is the equally violent repudiation of this reading in Koertge.

19 My understanding and use of the term “pederasty” here refers to Thomas King’s mapping of sexed power relations in early modern England.

20 References to *New Atlantis* are taken from *Three Early Modern Utopias* edited by Susan Bruce.

Atlantis is not discovery for the sake of possessing nature's secrets but the imitation of natural processes and the production of simulacra, copies, and improvements. As has been noted, Merchant's critique of Baconian science is based upon a naturalization of the female body (and its totem, "mother earth") as a vessel enclosed by a single, delicate, rupturable surface (Albanese 137, n31). Instead of a single, localized erotics of penetration, I want to suggest that what we find in *New Atlantis* is a preoccupation with extension, amplification, and wondrous distortion of the surface of things.²¹

Once it has been determined that the narrator and his newly-landed crew are Christians (and free of contagious disease) they are given an audience with the priestly Father of Salomon's house. The Father paints for them a vivid picture of Atlantean science and technology. He describes workshops or "houses" where a vast program of research and engineering takes place. Among these are "brewhouses," "bakehouses," "engine-houses," and "mathematical houses." There are "sound houses," where harmonies are engineered to produce sweeter, and daintier, but also deeper, "more extenuate and sharp" sounds than are known to the Europeans (182). As with each branch of the Atlantean science, the scientists in the sound houses seek to imitate, extend, and distort the impressions emitted by natural objects. They fashion hearing aids and telephonic devices that transmit as well as alter voices, returning them deeper or shriller or scrambled. In the "perfume-houses," smells seem to "breathe out of other mixtures than those that give them," and artificial flavours are fabricated "that will deceive any man's taste." Bacon describes a veritable Wonka factory in the "confiture-house" where can be found "all sweet-meats, dry and moist, and divers pleasant wines, milks, broths and sallets" that can be imagined (182). The same enchantment with sensory extension and illusion describes the "perspective-houses" where "demonstrations of all lights and radiations" produce "all delusions and deceits of the sight": telescopes and spectacles, microscopes and artificial rainbows.

The Atlantean houses have been understood by many critics to represent Bacon's vision for an English academy or society of science, which is all the more reason to note the peculiar way in which each of these houses produces imitations and amplifications of natural objects and phenomena

21 Graham Rees discusses the importance of the "frontier zone" in Bacon's speculative philosophy. This is the zone between the heavens and the core of the earth where "mutable terrestrial" phenomena could take place ("Francis Bacon's Speculative Philosophy" 136–37).

with the express purpose of disorientation or deception. After describing each house, and its emphasized illusory arts, the Father's tour of the utopian academy comes to the "houses of deceits of the senses," where the arts of "juggling, false apparitions, impostures, and illusions" are conducted. Here, the Father interrupts himself to offer strange assurance that even though the Atlanteans have the technical savvy to do so, they do not attempt to pass off the enhanced product as natural: "[S]urely you will easily believe that we that have so many things truly natural which induce admiration, could in a world of particulars deceive the senses, if we would disguise those things and labour to make them seem more miraculous." The Father raises the possibility of dissimulation only to dismiss it. The Bensalemites, who "hate all impostures and lies" have "severely forbidden it to all our fellows, under pain of ignominy and fines, that they do not show any natural work or thing, adorned or swelling; but only pure as it is, and without all affectation of strangeness." With this final note of warning, the Father concludes his recitation, bestowing the secret knowledge of his society upon the narrator, whom he now ceremonially addresses as "son."²²

In a world devoted to the science of affecting strangeness, the Father's dismissal of the suddenly problematic art of dissimulation is suspect to say the least. The obvious problem is the entirely conventional line between "illusion," which the Bensalemites adore, and "imposture," which they supposedly detest. Less obviously, the Father's proscription calls into question the very status of the natural or pure object. If the simulation is undifferentiable from the original body except where it surpasses it, why must its purity be protected? Where does the pure body begin and end? Where is its surface or skin? We might wonder whether or not it has one at all.

Bacon's hastily foreclosed depiction of the arts of deception in the Atlantean houses is resumed immediately following the famously abrupt conclusion, in the list appended to the utopian fragment titled "Magnalia Naturae, Praecipue Quoad Usus Humanos" or "great works of nature for the use of human kind." It is entirely unclear if this list reflects upon or extends the projects undertaken and proposed in *New Atlantis* or *Sylva Sylvarum* or if it casts a separate eye to the future of scientific research—as its orientation in the future tense and place at the book's end suggest. What is clear is the tension between the list and the priestly Father's final cautionary words on the relationship between illusion and duplicity.

22 On the patriarchal/patrimonial system in *New Atlantis* see Susan Bruce.

The “Magnalia Naturae” is a list of experiments in the science of altering and extending the limits of the natural or pure body that includes such items as “The mitigation of pain” and, directly following this entry, “The increasing of ability to suffer torture and pain” (186). What is striking about Bacon’s arrangement of these projects is the ease with which they move from one application to another. Projects that alter complexion, girth, and height are followed by a series of projects that seem to anticipate a Deleuzian body without organs: “Versions of bodies into other bodies,” the “Making of new species,” and “Transplanting of one species into another.” From experiments in the integration or transplanting of bodies into other bodies, Bacon moves to projects expressly concerned with the technology of bodily impressionability. Here he lists “Instruments of destruction,” as of war and poison, the “Exhilaration of the spirits,” and the “Force of the imagination, either upon another body, or upon the body itself.” These projects are to be taken up alongside experiments in the acceleration of decay and the transformation of substances from one kind to another. Burton pairs “Deception of the senses” and “Greater pleasure of the senses,” ending the list with “Artificial minerals and cements” (186). Each experiment is a *techne* in the art of manipulating the impressionable and malleable surfaces of pure bodies. The body’s interface with its environs is presented as being entirely liquid—a site of unlimited potential and as such an apt emblem for the horizon of Bacon’s proposed scientific method.

Despite the ecumenical breadth of inquiry into the nature of bodies in *Sylva Sylvarum*, the physical skin or integument is almost entirely absent from Bacon’s natural history—as it is in *New Atlantis*, where its most conspicuous occurrence is in the “brewhouse,” where the Atlanteans “strive to have drinks of extreme thin parts, to insinuate into the body [...] as some of them put upon the back of your hand will, with a little stay, pass through to the palm, and yet taste mild to the mouth” (180). Of course, here the skin isn’t named but is marked in the breach by the fantasy of absolute permeability. In *Sylva Sylvarum*, the skin is the illocutionary interface between the familiar and unfamiliar, a screen for the body’s “starting reflex.” Bacon describes the bristling of skin as the “erection of the spirits” that takes place in a scene of encounter described as an “inquisition” between body and world:

Starting is both an apprehension of the thing feared, and in that kind it is a motion of shrinking, and likewise an inquisition in the beginning, what the matter should be, and in that kind it is a motion of erection, and therefore when a man

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would listen suddenly to anything, he starteth; for the starting is an erection of the spirits to attend. (567–68)

In Bacon's account, the starting reflex appears to be one of fleeting confusion of sympathetic and antipathetic impulses as the body attempts to determine if the adjacent body is like or unlike, friendly or hostile. And so the startled or "aroused" skin shrinks as its spirits rush to the surface. The pores shrink and the follicles stand on end, making the body temporarily less permeable even while it is made thicker by a rash of goosebumps and bristling hair. The raised skin and hair extend the sensory surface outward so as to more readily receive and transmit information conveyed by the spirits that travel through and upon the body's surface.²³ Bacon describes tickling as a "light motion of spirits" upon the skin, which causes a (frequently painful) emission of breath (587). The body shrinks or "starts" at the unbearable, too-rare touch of another's hand that confuses pleasure and pain. The ticklishness of the soles of the feet, the underarms, and the sides of the body is attributed to the extreme thinness of these parts and the "rareness of being touched there." No matter that each of these areas are constantly touching or brushing up against other surfaces. Being tickled is by necessity a passive state of subjection to a sudden and rare excitation of the surface of the body.²⁴ Tickling is the result of suddenness, or surprise, as much as rareness of touch, which we see in the evidence that "no man can tickle himself" (587).

Bacon's description of the starting reflex is listed in the experiments illustrating "the impressions which the passions of the mind make upon the body." He lists other physiological displays of the passions in terms of the desire of inanimate spirits, "trapped like madmen" in the body, to escape. Screeching, like starting, "is an appetite of expelling that which suddenly striketh the spirits." So are "sighing, sobbing, groaning, screaming, and roaring; tears, distorting of the face, grinding of the teeth, sweating." Likewise "singing, leaping, dancing, and sometimes tears" are a result of the outward, pressing movement, or "dilation" as the spirits come forth from the recessed interior to the outward parts (715). Of course, such theatrical displays are wont to incite imitation. Bacon explains such mimetic transference as the readiness of the recipient to pick up information "by

23 Lisa Jardine refers to these spirits in Bacon's account of faculty psychology as the "animal spirits"—a term Bacon doesn't use in *Sylva Sylvarum* (89). See Sutton's account of the materiality of the animal spirits in *Philosophy and Memory Traces*, part 1.

24 Bacon's account of tickling here recalls the Campanellist account of perception as *passio*, or suffering. See Walker (216).

invitation" (296). Yawning and stretching occur when a body strives "to wring out and expel" the heavy and vaporous spirits "that loadeth them." A drowsy man is likelier to catch a yawn because his body is "apt and prepared to do the like"—apt and ready, that is, to imitate. Bacon intimates that a body cannot be moved against its will or, rather, that if a body is moved it is because it was already willing to be moved. "Willing" here refers to the discriminating perception or "desire" of the spirits that make up the body (they "embrace" and "recoil"). We ought to carefully note that where Bacon suggests the necessary willingness of the body to be altered by the force of the imagination, he refers not to the subject's will but to the will of the atoms that make up his body.

What Burton described as hypochondriacal sensitivity is more similar to Bacon's material "willingness to be altered" than would at first glance appear. Both writers substantiate their studies of the force of the imagination by reviewing the more familiar instances of mimetically and sympathetically transferred somatic experience. Bacon writes that when a man perceives another man eating something sour, "this object tainteth the imagination," and his teeth will be "set on edge" as well. He gives further examples:

So if a man see another turn swiftly and long, or if he look upon wheels that turn, himself waxeth sick. So if a man be upon a high place without rails or good hold [...] he is ready to fall: for, imagining a fall, it putteth his spirits into the very action of a fall. So many upon the seeing of others bleed, or strangled, or tortured, themselves are ready to faint, as if they bled, or were in strife. (598)

Unlike Burton, Bacon stops short of suggesting that the powers of the imagination can move a body to suffer the same manifest pains it witnesses or contemplates. Missing from this list are the bodies sympathetically choked by watching a strangling or bodies that bleed upon watching others bleed (or meditating upon the wounds of Christ).

Like Burton, however, Bacon argues that sympathetic transformations by force of the imagination take place along a continuum. He ranks such transformations from the most to the least tangible or demonstrable.²⁵ In

²⁵ Bacon ranks them accordingly: first are transmissions of the airy parts of the body (odours, infections); second are the visibles and sounds; third are bodies that attract from a distance ("electric" bodies); fourth are the spirits that work by sympathy, "not by forms, or celestial influxes [...] but by the primitive nature of matter." In the fifth category are the operations "of the spirits of the mind of

each category, Bacon cites the same myths and commonplaces debunked in his initial incrimination of superstition alongside more recognizable transformations of the same type. So “fascinations” wrought by power of the eye are weighed against evidence that fear and shame are infectious, as we see “when one man is out of countenance in a company, others do likewise blush in his behalf” (653). Bacon attempts to bridge the familiar and the foreign by illuminating the thick space of interaction between seemingly distant, detached, and discrete bodies. “It is less credible,” he writes, that this force “should be so incorporeal, and immateriate a virtue, as to work at great distances [...] but that the distance must be competent, the medium not adverse, and the body apt and proportionate” (657).

The one thousandth and final experiment of *Sylva Sylvarum*, “touching the general sympathy of men’s spirits,” qualifies the magic of sympathetic cures by suggesting that the desire for fame, honour, and the affections of others is perhaps the best evidence of a universal principle of sympathy between men. Bacon surmises that the delight men have “in popularity, fame, honour, submission, and subjection of other men’s minds, wills, or affections [...] is not without some signification.” Why else, he asks, “should men be so much affected with that which others think or say?” (672). With this suggestion, the ten centuries of *Sylva Sylvarum* conclude, *mise en abyme*, with an appeal for the reader’s good opinion of his book. He also concludes by way of caution, remarking that if it is a sign of the “best temper of minds” to seek positive judgment, it is likewise the mark of depravity and tyranny to impose doctrine over the impressionable minds of men:

The best temper of minds desireth good name and true honour: the lighter, popularity and applause: the more depraved, subjection and tyranny: as is seen in the great conquerors and troublers of the world: and yet more in arch-heretics; for the introduction of new doctrines is likewise an affectation of tyranny over the understandings and beliefs of men. (672)

This warning echoes the Father’s final words at the conclusion of *New Atlantis*. How one conducts oneself with respect to the impressionability of the minds of others is a matter of utmost ethical importance.

man upon other spirits”; sixth are the celestial influences; seventh are the direct operations of sympathetic or natural magic (imparting the characteristics of one object to another by proxy, as in the use of amulets); eighth and last are the indirect operations of sympathetic transference, such as the hotly contested weapon salves that work by applying ointments to the weapon instead of the wound (643–45).

The impressionability of the mind and the pellicular thinness of the separation between bodies underwrites an ethics of social relation markedly different than Burton's, even if modeled on the same physics. Burton cites from an immense but finite set of texts in the humanist library. His centonic reading and writing is depicted as being mimetically sympathetic with the assimilatory and hypochondriacal posture of the melancholiac toward the Other. Burton's cento usurps, adopts, and makes, as he says, "*omne meum nihil meum*," or "all and nothing mine" (1:1). In this vein, Burton's thin-skinned, hypochondriacal melancholiacs are the unwitting champions of a cosmology and physiology of perception based upon the principles of an ethical as well as a material sympathy. Unlike Bacon, who seems to suggest that the will to imitate comes from an insensible body, Burton makes sympathy and impressionability qualities of a melancholic disposition to be admired and cultivated. Sympathy for the Oxford librarian and Anglican divine is tied to a cosmology of Christian grace and redemption. To be open to impression means not only to retain the imprint of humanist learning but also to yield to the "Alexipharmicum" of grace that pervades the body (3:437). It must be transmitted through acts of generosity, which Burton regards as being as necessary for moral health as humoral evacuation and bodily porosity are for the health of the body.

The problem of the impressionability of the mind for Bacon may be summed up in a second definition of wonder he coined, less famous than the first and aforementioned one. In *Sylva Sylvarum*, Bacon writes that wonder is caused by the "fixing of the mind upon one object of cogitation, whereby it does not spaiate and transcur" (570). Unlike fear, where the spirits scatter and fly away, wonder is a state of astonishment, literally a paralysis of spirits which are otherwise healthfully motile. The "fixing of the mind upon a cogitation" (what Burton would call a "conceit") *transfixes* the spirits, displacing them from the space of the encounter between the known and unknown and fixing them in the "elsewhere" of the *object fixe*. Bacon describes the "posture" of wonder: the eyes cast up, the hands lifted, as a mode of submission or, as Bacon calls it, an "appeal to the Deity; which is the author, by power and providence, of strange wonders" (570). Wonder forfeits enquiry and makes the mind vulnerable to untested doctrine and superstitions, new and old. And yet, it is to this mode of wonder that Bacon appeals in *Sylva* and *New Atlantis*, while offering a mode of inquiry that aims to strip phenomena of the residue of received opinion to a bare encounter out of which the mind and body *induct*—literally lead or take in and evaluate naked impressions of an object or phenomenon. The nakedness of this encounter, and the openness of the mind required by it, leaves

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the inquirer vulnerable to manipulation. This tension illuminates Bacon's joint fascination with and precaution against the arts of deception. The very mechanics that make a body capable of learning wonderfully make him equally vulnerable to learning wrongly.

The anxiety of influence is not with the body's porosity, or the substituted imagination for the skin boundary, but with the question of *which* spirits and images enter and are assimilated. The problem associated (at least for Bacon) with the exquisite impressionability of the body and mind—with having not only an imaginary skin but the imagination for a skin—is the ontological problem of the surface itself. If the imagination can be moved to produce somatic effects between and across bodies, the discernment of absolute differentiation between bodies becomes a near categorical impossibility and Bacon's intellectual project is suspended by the same principles of sympathy that underwrite his physiology of perception. If the senses can be impressed upon to accept the copy in place of the natural object, and the dissimulation or illusion instead of the real, Bacon's empirical program is at risk of being undermined by the same physics of extension and alteration with which it is most deeply rapt.

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Works Cited

- Albanese, Denise. *New Science, New World*. Durham: Duke UP, 1996.
- Anzieu, Didier. *The Skin Ego*. New Haven: Yale UP, 1989.
- Ausonius, Decimus Magnus. *Ausonius*, vol 1. Trans. Hugh G. Evelyn-White. Cambridge: Harvard UP (Loeb Classical Library), 1919–21.
- Bacon, Francis. *Sylva Sylvarum* in *The Works of Francis Bacon*, vol 2. Eds. James Spedding, Leslie Ellis, and Douglas Heath. London: Longman, 1857.

- . *De Viis Mortis*. Ed and trans. Graham Rees. *Francis Bacon's Natural Philosophy: A New Source: A Transcription of Manuscript Hardwick 72A*. Chatsworth: British Society for the History of Science, 1984.
- . *New Atlantis*. Ed. Susan Bruce. *Three Early Modern Utopias*. New York: Oxford UP, 1999.
- Bakhtin, Mikhail. *The Dialogic Imagination*. Trans. Caryl Emerson and Michael Holquist. Austin: Texas UP, 1981.
- Beier, Lucinda McCray. *Sufferers and Healers: The Experience of Illness in Seventeenth-Century England*. New York: Routledge, 1987.
- Benthien, Claudia. *Skin: On the Cultural Border Between Self and World*. Trans. Thomas Dunlap. New York: Columbia UP, 2002.
- Boesky, Amy. *Founding Fictions: Utopias in Early Modern England*. Athens: Georgia UP, 1996.
- Breintenberg, Mark. *Anxious Masculinity in Early Modern England*. New York: Cambridge UP, 1996.
- Bruce, Susan, ed. and Introduction. *Three Early Modern Utopias*. New York: Oxford UP, 1999.
- Burton, Robert. *The Anatomy of Melancholy*. Eds. T. C. Faulkner, N. K. Kiesling, and R. L. Blair. Oxford: Clarendon, 1989.
- Caciola, Nancy. *Discerning Spirits: Divine and Demonic Possession in the Middle Ages*. Ithaca: Cornell UP, 2003.
- Clark, Stuart. *Thinking with Demons: The Idea of Witchcraft in Early Modern Europe*. 1997; New York: Oxford UP, 1999.
- Connor, Steven. *The Book of Skin*. Ithaca: Cornell UP, 2004.
- Crooke, Helkiah. *Microcosmographia: A Description of the Body of Man Together with the Controversies Thereto Belonging*. London, 1615.
- Debus, Allen, G. *The Chemical Philosophy: Paracelsian Science and Medicine in the Sixteenth and Seventeenth Centuries*. New York: Science History Publications, 1977.
- Evans, Robert. *The Psychiatry of Robert Burton*. New York: Columbia UP, 1944.
- Harding, Sandra. *The Science Question in Feminism*. Ithaca: Cornell UP, 1986.
- . *Whose Science, Whose Knowledge?* Ithaca: Cornell UP, 1991.

- Harvey, Elizabeth, ed. *Sensible Flesh: On Touch in Early Modern Culture*. Philadelphia: University of Pennsylvania Press, 2003.
- Jardine, Lisa. *Francis Bacon: Discovery and the Art of Discourse*. Cambridge: Cambridge UP, 1974.
- Keller, Evelyn Fox. *Reflections on Gender and Science*. New Haven: Yale UP, 1985.
- King, Thomas. *The Gendering of Men 1600–1750: The English Phallus*, vol. 1. Madison: University of Wisconsin Press, 2004.
- Koertge, Noretta. *A House Built on Sand: Exposing Postmodernist Myths about Science*. New York: Oxford UP, 1998.
- Mazzio, Carla. “Acting with Tact: Touch and Theater in the Renaissance.” *Sensible Flesh*. Ed. Elizabeth Harvey. Philadelphia: University of Pennsylvania Press, 2003. 159–86.
- Merchant, Carolyn. *The Death of Nature: Women, Ecology, and the Scientific Revolution*. San Francisco: Harper and Row, 1980.
- Pagel, Walter. *Paracelsus: An Introduction to Philosophical Medicine in the Era of the Renaissance*. 2nd ed. Basel: Karger, 1982.
- Nochimson, Richard L. “Robert Burton: A Study of the Man, His Work, and His Critics.” PHD diss. Columbia University, 1967.
- Pasnau, Robert. *Theories of Cognition in the Later Middle Ages*. New York: Cambridge UP, 1997.
- Paster, Gail Kern. *Humoring the Body: Emotions and the Shakespearean Stage*. Chicago: University of Chicago Press, 2004.
- . *The Body Embarrassed: Drama and the Disciplines of Shame in the Early Modern Period*. Ithaca: Cornell UP, 1993.
- Peltonen, Markku. Introduction. *The Cambridge Companion to Bacon*. New York: Cambridge UP, 1996.
- Rees, Graham, ed. *Francis Bacon’s Natural Philosophy: A New Source: A Transcription of Manuscript Hardwick 72A*. Chatsworth: British Society for the History of Science, 1984.
- . “Francis Bacon’s Speculative Philosophy.” *The Cambridge Companion to Bacon*. Ed. Markku Peltonen. New York: Cambridge UP, 1996.
- Rouse, Mary A., and Richard H. Rouse. *Authentic Witnesses: Approaches to Medieval Texts and Manuscripts*. Notre Dame: University of Notre Dame Press, 1991.

- Schoenfeldt, Michael. *Bodies and Selves in Early Modern England*. New York: Cambridge UP, 1999.
- Shumaker, Wayne. *Natural Magic and Modern Science*. Binghamton: Center for Medieval and Early Renaissance Studies, State University of New York at Binghamton, 1989.
- Shirilan, Stephanie. "The Pleasures of Mimetic Sympathy in Robert Burton's *The Anatomy of Melancholy*." PHD diss. Brandeis University, 2009.
- Siraisi, Nancy. *Medieval and Early Renaissance Medicine*. Chicago: University of Chicago Press, 1990.
- Spruit, Leen. *Species Intelligibilis: From Perception to Knowledge*. Leiden, New York: Brill, 1995.
- Sutton, John. *Philosophy and Memory Traces: Descartes to Connectionism*. Cambridge: Cambridge UP, 1997.
- . "Spongy Brains and Material Memories." *Environment and Embodiment in Early Modern England*. Eds. Mary Floyd-Wilson and Garrett A. Sullivan, Jr. Basingstoke: Palgrave, 2007.
- Thorndike, Lynn. *A History of Magic and Experimental Science*. New York: Macmillan, 1923.
- Tilmouth, Christopher. "Burton's 'Turning Picture': Argument and Anxiety in *The Anatomy of Melancholy*." *Review of English Studies* 56 (2005): 524–49.
- Verweyen, Theodor, and Gunther Wittig. "The Cento: A Form of Intertextuality from Montage to Parody." *Intertextuality*. Ed. Heinrich Platt. Berlin: Walter de Gruyter, 1991.
- Vickers, Brian. *Occult and Scientific Mentalities in the Renaissance*. New York: Cambridge UP, 1984.
- Walker, D.P. *Spiritual and Demonic Magic: From Ficino to Campanella*. 1958; Philadelphia: University of Pennsylvania Press, 2000.
- Wear, Andrew. *Knowledge and Practice in Early Modern English Medicine 1550–1680*. New York: Cambridge UP, 2000.

