

DIFFERENCE ENGINES

DIFFERENCE ENGINES:
TECHNOLOGY AND GENDER IN EIGHTEENTH-CENTURY BRITAIN

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Abstract

In this dissertation, I argue that modern understandings of both technology and gendered selfhood were mutually fashioned across the long eighteenth century. This argument makes a number of interventions in current scholarly narratives by contending, first, that interiorized subjectivity was conceptualized in the eighteenth century as constructed from (and perceptible through) a series of technological objects; second, that as gender difference was increasingly inscribed on bodies thought to be characterized by intrinsic biological variance, the importance of technological supplements to defining bodily capacities meant that this variance was often realized through artificial objects; and third, that the mechanization of the British textile manufacture, which has been identified as the industrial revolution's catalyst, was premised not on machines' inherent efficacy, but on the identification of technological ingenuity with a new kind of British masculinity, and a concurrent devaluation of supposedly primitive Indian and British female labourers.

In my first chapter, I explore the relationship between optical technologies and stage machinery through a reading of Aphra Behn's *The Emperor of the Moon*, arguing that Behn's play enacts a radical revision of technological empiricism by privileging experiences of feminized spectacular materiality as sites of knowledge. My second chapter traces the afterlife of Restoration mechanical philosophy in Samuel Richardson's *Clarissa*, and explores how Clarissa's interiority is conceptualized by both Lovelace and Richardson as fundamentally technological. In my third chapter I turn to John Cleland's pornographic *Memoirs of a Woman of Pleasure*, showing how the text's representations of the technologies of textual production are intimately linked with its eroticism and violence. In my final chapter, I analyse a collection of political pamphlets and popular treatises to show how the industrialization of the British cotton manufacture erected a technological nationalism through the mechanical appropriation of women's labour.

By attending to the material, textual, and conceptual operations of eighteenth-century technologies through readings of a wide range of literary and popular works, this project ultimately demonstrates how the boundaries of modern gender difference were constructed along with and out of the body's most artificial parts.

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INTRODUCTION

This dissertation explores the changing relationship between subjects and technological objects across the long eighteenth century in Britain. As it does so, it advances a twofold argument: that technology was key to the production of new forms of gendered embodiment and subjectivity, and that gendered embodiment and subjectivity were likewise key to the production of new technologies. As I will explore across the following chapters, this mutually productive relationship between subjects and the artificial objects that replicated and extended their bodily capacities changed, from the Restoration to the end of the eighteenth century, what was recognized as a body and a self.

This project thus reconsiders a number of stories often told about the eighteenth century: of how Britain was the site of a shift towards a modern, individualized, and interiorized subjectivity,¹ of the slow sea change from more fluid Galenic understandings of gendered embodiment to the two-sex model still dominant today,² and of how a technologically-driven revolution precipitated by British industry fundamentally changed the way people related to technology and to their labouring bodies.³ Through close

¹ See, for example, the classic accounts in Ian Watt, *The Rise of the Novel: Studies in, Defoe, Richardson, and Fielding* (Berkeley: University of California Press, 1957); Nancy Armstrong, *Desire and Domestic Fiction: A Political History of the Novel* (Oxford: Oxford University Press, 1987); and Dror Wahrman, *The Making of the Modern Self: Identity and Culture in Eighteenth-Century England* (New Haven: Yale University Press, 2006).

² Thomas Laqueur's *Making Sex: Body and Gender from the Greeks to Freud* (Cambridge: Harvard University Press, 1990) is still the key text in this narrative; Karen Harvey has offered an influential critique of (along with an overview of responses to) Laqueur in "The Century of Sex? Gender, Bodies, and Sexuality in the Long Eighteenth Century," *Historical Journal* 45, no. 4 (2002): 899-916, doi: 10.1017/S0018246X02002728.

³ See, for example, Maxine Berg, *The Age of Manufactures: Industry, Innovation, and Work in Britain, 1700-1820* (Totowa: Barnes and Noble, 1985); Ivy Pinchbeck, *Women Workers in the Industrial Revolution*

readings of texts and technological objects, I argue that these three historical and cultural changes are interrelated, and that recognizing them as linked changes the way we understand all of them. My interventions in these narratives are as follows: I contend that across a number of genres in eighteenth-century Britain, interiorized subjectivity is repeatedly conceptualized as a technological construction, and that the drive (at once epistemological and sexual) to discover and describe this mysterious interiority is likewise framed and facilitated by technological objects and processes. Second, I argue that as gender difference was inscribed on bodies that were increasingly thought to be characterized by intrinsic biological variance rather than the relative continuity traditional in humoral theory, the importance of technological supplements to defining the capacities of gendered bodies meant that this difference was often realized through artificial objects. Thus, paradoxically, as gender difference is supposedly naturalized, it is actually made artificial. Finally, I revisit what has long been identified as a key moment in the industrial revolution—the mechanization of labour in the British textile industry across the latter half of the eighteenth century—and resituate it in light of my arguments about gender and technology. I assert that this development was premised not on the inherent superiority of machines, but on the identification of technological ingenuity with a new kind of British masculinity, and of a concurrent devaluation of supposedly primitive Indian and British female textile labourers in favour of machines that replicated and abstracted their abilities.

1750-1850, (New York: A.M. Kelley, 1969); and Bridget Hill, *Women, Work, and Sexual Politics in Eighteenth-Century England* (Oxford: B. Blackwell, 1989).

By taking technology as its subject, this project is about something that did not exist in the eighteenth century. What we retroactively label “eighteenth-century technologies” would have been variously categorized under labels like machinery, engines, artificial instruments, manufactures, and the so-called “useful arts,” but never identified as technologies. When the term “technology” was used in eighteenth-century British texts, as it was with increasing (though still minimal) frequency after the 1780s, it referred to an intellectual project rather than a material object or process. A. G. Sinclair, for example, writes in 1791 that “technology” is a “description of the arts, especially mechanical,”⁴ and Eberhard Zimmerman (drawing on the German concept *technologie*) defines it in 1787 as “a new branch of scientific knowledge...the theory and accurate description of useful arts and manufactures.”⁵ Another text from the 1780s describes Linnaeus’s new system of botanical taxonomy as a “solid, certain, and definitive technology,”⁶ while a popular 1737 work called the *Bibliotheca Technologica* encyclopedically gathers the principles of “Literary Arts and Sciences,” including sections on such seemingly disparate fields as mythology, rhetoric, anatomy, chronology, and heraldry.⁷ Before technology came to signify what Eric Schatzenberg calls the

⁴ A.G. Sinclair, *Artis medicinae vera explanatio: or, a true explanation of the art of physic. Containing a plain and accurate account of all the diseases incident to the human body* (London: J. Johnson, 1791), 216, Eighteenth-Century Collections Online (hereafter ECCO) (CW3306980770).

⁵ Eberhard August Wilhelm von Zimmermann, *A political survey of the present state of Europe, in sixteen tables* (London: C. Dilly, 1787), iii, ECCO (CW3305337057).

⁶ Dietrich Heinrich Stoeber, “Interesting Particulars of the Person, Character, and Peculiarities of the Celebrated Linnaeus,” trans. Joseph Trapp, in *The Weekly entertainer; or Agreeable and instructive repository. Containing a collection of select pieces, both in prose and verse; curious anecdotes, instructive tales, and ingenious essays on different subjects*, vol. 27 (Sherborne: R. Goadby, 1783), 147, ECCO (CB3328768071).

⁷ Benjamin Martin, *Bibliotheca technologica: or, a philological library of literary arts and sciences* (London: John Noon, 1737), 1, ECCO (CW3313053617).

“material culture of modernity” (a meaning it only took on in the early twentieth century), the term denoted one of modernity’s defining activities: the organization of knowledge into useful systems on the printed page for readers to understand and employ.⁸

Technology was, in the eighteenth century, a thing literary.

In contrast, the definition of technology I use in this project is anachronistically grounded in the material. The technologies I discuss over the next four chapters are objects that artificially extend, alter, or instrumentalize the human body and its capacities. In some ways, then, my understanding of “the technological” recalls Marshall McLuhan’s classic assertion in *Understanding Media* that “[a]ny invention or technology is an extension or self-amputation of our physical bodies,”⁹ an argument itself informed by Freud’s assertion, in *Civilization and its Discontents*, that “with every tool man [*sic*] is perfecting his own organs, whether motor or sensory.”¹⁰ These classic accounts of technological objects and their relationship to the body are limited, however, by their location in models of teleological progress in which technological innovation and the progress of “civilization” are bound together, with the material products of this innovation themselves inciting revelations and revolutions. This tradition, named “technological determinism” by historians of technology, has been widely criticized by many since the 1960s.¹¹ In particular, feminist and critical race theorists have

⁸ Eric Schatzberg, “*Technik Comes to America: Changing Meanings of Technology before 1930*,” *Technology and Culture* 47, no. 3 (2006): 488, <http://www.jstor.org/stable/40061169>. For more on the history of the term “technology,” see Ruth Oldenziel, *Making Technology Masculine: Men, Women, and Machines in America 1870-1945* (Amsterdam: Amsterdam University Press, 1999).

⁹ McLuhan, *Understanding Media: The Extensions of Man* (Cambridge: MIT Press, 1966), 45.

¹⁰ Freud, *Civilization and its Discontents* (New York: W.W. Norton, 1961), 37.

¹¹ See, for example, Robert L. Heilbroner’s article “Do Machines Make History?,” *Technology and Culture* 8, no. 3 (1967): 335-345, <http://www.jstor.org/stable/3101719>, and Leo Marx’s “The Idea of ‘Technology’

demonstrated how definitions of what qualifies as “technological” have constructed trajectories of progress that exclude and exploit women and racialized people.¹² My work follows these critics in resituating technologies as objects and processes embedded in historically contingent configurations of power, rather than innovations driving a relentlessly teleological narrative to its future. Further, this project interrogates these deterministic narratives’ emergence in an industrializing Britain, exploring how it was that technologies became positioned as engines of progress and indispensable supplements for the rational British citizen. Following this uneven and decidedly not inevitable process, I explore how technological determinism is as unstable at its earliest moments as it appears now in retrospect. The alternate, nondeterministic model of technology I put forward in this project sees the relationship between technological objects and the human body as a mutually constructive one. As technologies are created to extend or alter the capacities of the human body, these acts of artificial reproduction are grounded in the replication of normative models of the “natural” body, and yet simultaneously redefine how the body’s functions, meanings, and boundaries are able to be understood. While these redefinitions are linked in complex ways to social and historical change, the technological objects involved in them are not the instigators or

and Postmodern Pessimism” in *Does Technology Drive History?*, ed. Merritt Roe Smith and Leo Marx (Cambridge: MIT Press, 1994). Lewis Mumford’s *Technics and Civilization* (1934; New York: Harcourt, Brace & World, 1963) had questioned deterministic narratives in the 1930s.

¹² See, for example, *Gender and Technology: A Reader*, ed. Nina E. Lerman, Ruth Oldenziel, and Arwen P. Mohun (Baltimore: Johns Hopkins University Press, 2003); Carolyn de la Peña, “The History of Technology, the Resistance of Archives, and the Whiteness of Race,” *Technology and Culture* 51, no. 4 (2010): 919-937, doi: 10.1353/tech.2010.0064; *Technology and the African-American Experience*, ed. Bruce Sinclair (Cambridge: MIT Press, 2004), Lydia H. Liu, “Robinson Crusoe’s Earthenware Pot,” *Critical Inquiry* 25, no. 4 (1999): 728-757, <http://www.jstor.org/stable/1344101>; and Rajani Sudan, “Mud, Mortar, and other Technologies of Empire,” *The Eighteenth Century* 45, no. 2 (2004): 147-169, <http://www.jstor.org/stable/41467944>.

arbiters of progress, nor do they automatically grant access to privileged ways of being and knowing. The process through which this self-moving power was assigned to technological objects and believed to be transmitted—or not—to the bodies that used them is one of this study’s central concerns.

While I focus in this project on specific material artifacts and their operations—objects like optical instruments, printing presses, clocks, and textile machines—the technologies discussed in this dissertation, like the technologies of the eighteenth century, are most frequently to be found upon the page. The eighteenth century’s exploding print culture, itself supported by changes in how text could be produced and distributed,¹³ is not a discrete record of technological objects and processes, but both a material product and discursive extension of them. The way that the functions of technologies were represented and reproduced on the page is, as I will show across this project, a key part of those functions. As it explores the textual life of material systems, this project therefore brings the contemporary definition of technology into contact with its eighteenth-century precursor, using the disjunction of anachronism as a productive force. At this point of contact, my work draws on that of Foucault, in which he defines technology as a “matrix of practical reason.”¹⁴ As this definition suggests, while his descriptions of technologies are linked to material processes (particularly the disciplining of the body through

¹³ The classic account of these changes is Elizabeth Eisenstein’s *The Printing Press as an Agent of Change: Communications and Cultural Transformations in Early Modern Europe* (Cambridge: Cambridge University Press, 1979). See also Adrian Johns, *The Nature of the Book: Print and Knowledge in the Making* (Chicago: University of Chicago Press, 1998) and, more recently, Christopher Flint, *The Appearance of Print in Eighteenth-Century Fiction* (Cambridge: Cambridge University Press, 2011).

¹⁴ Foucault, “Technologies of the Self,” in *Technologies of the Self: A Seminar with Michel Foucault*, ed. Luther H. Martin, Huck Gutman, and Patrick H. Hutton (London: Tavistock, 1988), 18.

increasingly mechanized forms of labour) they extend beyond them to describe a much wider range of techniques through which power produces and regulates the subject, and through which the subject comes to know itself. Foucault's description of technology is an account that, like eighteenth-century uses of the term, draws on its Greek root: *techne*, signifying an "art, skill, or craft; a technique, principle, or method by which something is achieved or created."¹⁵ These artful methods, at once material, textual, and conceptual, are what I trace across the following chapters.

What does the kind of technology I have been describing—at once familiar and alien, material and discursive—actually look like, and how does it interact with the gendered body? I can begin to explain by asking another question: is a lady's decorative fan technological? Such a description may seem incongruous, but it recurred with surprising persistence through the late seventeenth and early eighteenth centuries: Francis Atterbury wrote in 1692, for instance, of the "[e]ngine of small force in love"¹⁶ that played in women's hands, while Addison termed the accessory a "little Modish Machine" in 1711's *Spectator* 102.¹⁷ Most notably, in John Gay's mock-epic 1713 poem *The Fan*, the titular ornament is repeatedly described as a "machine," a "fantastick Engine" wielded by women who "grace each Motion" of their hands and arms with the "restless

¹⁵ *Oxford English Dictionary Online*, s.v. "techne, n.," last modified March 2014, <http://www.oed.com/view/Entry/273538>.

¹⁶ Atterbury, "Written on a White Fan Borrowed from Miss Osborne, Afterwards His Wife," reprinted in Thomas Stackhouse's *Memoirs of the life, and conduct, of Dr. Francis Atterbury, late Bishop of Rochester, from his birth, to his banishment* (London, 1723), 7, ECCO (CW3303260972). References are to page numbers in this edition.

¹⁷ Addison, "Spectator 102," in *The Spectator*, 5th ed. (London: J. Tonson, 1720), 2:76, ECCO (CB131321980). References are to this edition.

Toy.”¹⁸ Exploring why this metaphor was repeatedly deployed—and what it accomplished when it was—helps to illuminate my argument that technological objects were implicated in emergent modes of subjectivity and gendered embodiment during the eighteenth century.

As its appearance in Gay’s ironic epic and in *The Spectator* suggests, the fan-machine was an image that worked satirically. Addison’s piece describes a fictional “Academy for the training up of young Women in the *Exercise of the Fan*,” established on the premise that “Women are armed with Fans as Men with Swords, and sometimes do more Execution with them” (76). The Fan Academy thus enables women to “be entire Mistresses of the Weapon which they bear” by training them in disciplinary drills that mimic military exercises.¹⁹ While Addison’s initial point of reference for the woman’s “weapon” is a sword, his description of these military maneuvers suggests a more modern point of reference for its metaphorical force, as does his account later in the piece of successfully training women to “*discharge a Fan*” by snapping it closed “in such a Manner, that it shall make a Report like a Pocket-Pistol” (77). Gay’s *The Fan* quickly moves to make the same comparison between fan and weapon, and emphasizes the link between the fan fad and innovative military techniques even more explicitly than Addison does. Gay’s narrator wonders how modern lovers will “withstand” the siege of

¹⁸ Gay, *The Fan. A Poem. In Three Books* (London: J. Tonson, [1713]), 10, ECCO (CW3312963648). References are to page numbers in this edition.

¹⁹ See, for example, this passage: “When my Female Regiment is drawn up in Array, with every one her Weapon in her Hand, upon my giving the Word to *handle their Fans*, each of them shakes her Fan at me with a Smile, then gives her Right-hand Woman a Tap upon the Shoulder, then presses her Lips with the Extremity of her Fan, then lets her Arms fall in an easy motion, and stands in a Readiness to receive the next word of Command” (76).

love when “these new Arms shall grace your Charmer’s hand,” and underlines his point with a mock-epic simile:

When kindling War the ravag’d Globe ran o’er,
And fatten’d thirsty Plains with human Gore,
At first, the brandish’d Arm the Jav’lin threw,
Or sent wing’d Arrows from the twanging Yew;
In the bright Air the dreadful Fauchion shone,
Or whistling Slings dismiss’d th’uncertain Stone.
Now Men those less destructive Arms despise,
And wasteful Death from thundring Cannon flies,
One Hour with more Battalions strows the Plain,
Than were before in Weekly Battels slain.
So Love with fatal Airs the Nymph supplies... (11-12)

Like Addison’s before him, Gay’s image of the weaponized fan evokes modernity’s increasingly technological (and thus increasingly fatal) warfare, with the fan supposedly functioning as a similarly lethal implement recently added to the coquette’s arsenal. While the martial fan-machine is thus superficially compared to artillery by Addison and Gay, the actual function of the satirical metaphor is to emphasize the disjunction between decorative ornament and deadly weapon. Despite their location in pieces of drollery, the pistols, cannons, and military maneuvers retain their force, as we can see in bloody descriptions like the extended simile quoted above. In contrast, the fan is positioned as this martial technology’s most trifling echo, a “Female Toy” potent only within the circumscribed bounds of the “Wardrobe’s magazine” (7, 13). The image of the military fan therefore sets up a contrast between a continuing tradition of male technological ingenuity (linked implicitly with conquest and domination) and a feminized ornamental triviality made spectacularly ineffectual by comparison.

This military fan imagery seems to suggest that the fan is described as a machine in order to satirically emphasize its *non*-technological (and therefore trivial) qualities, but other aspects of Addison and Gay's pieces complicate this assessment. In Spectator 102, the Fan-Academy's director begins to explain the "infinite Variety of Motions to be made use of in the *Flutter of a Fan*" ("the timorous Flutter, the confused Flutter, the merry Flutter," and so on) but fails to catalogue them all, since "there is scarce any Emotion in the Mind which does not produce a suitable Agitation in the Fan; insomuch, that if I only see the Fan of a disciplin'd Lady, I know very well whether she laughs, frowns, or blushes" (78); Gay similarly describes how "ev'ry Passion" now "by the *Fan* is seen, / From chatt'ring Anger to the sullen Spleen" (31). These accounts, which move away from metaphorical conceits to describe more literally the function of fans in the hands of ladies, position the accessory as a kind of supplemental part intimately linked with the passions. The fan is animated, just like other parts of the body, by the passions' "emotions," and projects them visibly onto its paper screen.²⁰ Publicizing feeling in a way that, as Addison suggests, takes over the work of a blush or laugh, the fan artificially extends embodied experience and instrumentalizes the internal motions of the passions. In short, the fan is a technology of feeling. And, while Addison and Gay mock this

²⁰ "Emotion" was, at the time Addison wrote his piece, primarily linked with *motion* (connoting "[m]ovement; disturbance" or "perturbation," as noted in the *Oxford English Dictionary*)—the motion of, for example, the passions or animal spirits. As Sara Landreth writes, eighteenth-century physiognomists believed that "the motions of the facial muscles were a direct indication of one's inner emotions or 'spirit'; those muscles made internal and invisible motions into external and readable motions." Addison's use of the term 'emotion' in this context thus emphasizes the fan's status as an artificial organ moved by the same passions, and in the same manner, as "natural" parts of the body. See Landreth, "The Vehicle of the Soul: Motion and Emotion in Vehicular It-Narratives," *Eighteenth-Century Fiction* 26, no. 1 (2013): 107, doi: 10.1353/ecf.2013.0043.

“waving Engine” (Gay 30), its capacities unsettle them. Spectator 102 imagines a Lady “disciplin’d” by the Fan Academy’s regimen, her instrument’s motions regularized and able easily to be understood, such that with a glance the curious observer will “know very well” what lies behind it. Gay likewise describes fan usage as a disciplined art, but his point of reference here is rhetorical, not military: “As learned Orators that touch the Heart, / With various Action raise their soothing Art, / Both Head and Hand affect the list’ning Throng, / And humour each Expression of the Tongue,” so (in the quotation referenced above) “ev’ry Passion by the *Fan* is seen” (31). This discipline does not serve observers by providing a transparent screen for women’s interior lives, but instead an opaque one that allows the fan-holder to conceal herself behind it: as Gay continues,

The peeping *Fan* in modern Times shall rise,
Through which unseen the female Ogle flies;
This shall in Temples the sly Maid conceal,
And shelter Love beneath Devotion’s Veil. (31)

The fan’s mechanism, while still linked to the passions, affords women sexual agency by screening their true nature from view. *The Fan* therefore undermines Spectator 102’s assertion that “a Fan is either a Prude or Coquet, according to the Nature of the Person who bears it” (78); joining the head, hand, and tongue as rhetorical instruments, the fan instead enables women to create fictional narratives around and out of their embodied experience, while facilitating a desiring female gaze that rebuffs detection or control. Functioning as a culturally inscribed boundary behind which a mysterious interiority flourishes, the fan here emerges as a technology not only of feeling, but also of modern subjectivity.

Gay's description of the fan's function destabilizes the satirical thrust of the fan-machine image he employs throughout the poem: while the fan is not the technology of male military force and ingenuity with which he contrasts it, it is nonetheless a potent mechanism for the woman who "veils" her "conscious Blushes" and "levell'd Glance" (15) with the fictional representations of the fan's screen. Extending the female body and remaking its passions for public view, the fan frustrates those who would apprehend what lies behind it. The accessory's perceived link with female creative power (and sexual transgression) is underlined when, in Gay's fan origin story, Minerva herself uses her "creative Pencil" to "stain" the ur-fan's leaves with "Follies of the Female Kind" (23-24). The goddess's decoration of this original fan is described by Gay as a fantasy of pure mimesis: "As Gods are bless'd with a superior Skill, / And, swift as mortal Thought, perform their Will, / Straight she proposes, by her Art divine, / To bid the Paint express her great Design. / Th' assembled Pow'rs consent," and "O'er the fair Field, Trees spread, and Rivers flow, / Tow'rs rear their Heads, and distant Mountains grow; / Life seems to move within the glowing Veins, / And in each Face some lively Passion reigns." (23). At this point Gay breaks from his faux-mythological account to compare Minerva's creative process to the function of a more modern device: the camera obscura. "Thus have I seen," he interjects in the first person,

Woods, Hills, and Dales appear,
Flocks graze the Plains, Birds wing the silent Air
In darken'd Rooms, where Light can only pass
Through the small Circle of a convex Glass;
On a white Sheet the moving Figures rise,
The Forrest waves, Clouds float along the Skies. (24)

This odd moment interrupts Minerva's work to foreground a recently popularized optical technology, making it the reference point for her divine mimesis and aligning the male poet's perception with the camera obscura's mechanism. The interjection draws our attention away from Minerva's fan and towards Gay's *Fan*, an object made (like the accessory described in it) with paper and feathers, and on whose leaves representations of female follies are inscribed. By inserting himself into this moment, Gay reminds the reader that he is the true author of the epic of superficiality Minerva unspools onto the fan, in a series of representations based on his camera-like perception of what the accessory and its users would obfuscate. By translating the "Female Toy" into a textual artifact, Gay replicates Francis Atterbury's conceit in his own *Fan*, verses that he supposedly "wrote upon the Lady's white Fan, whom he afterwards made his Wife" (7). While in Atterbury's poem, "Flavia, the least and slightest Toy, / Can with resistless Art employ," the lady's fan is literally overwritten by the poet and so made into his own "Engine," one with an efficacy proven by his success in courtship but also, more significantly, by the poem's fame and longevity (it was reprinted in countless miscellanies across the eighteenth century). In a 1713 letter from Alexander Pope to Gay, Pope traces the same movement from trinket to celebrated text: "I am very much recreated and refreshed with the news of the [advancement] of the *Fan*," he writes, "which, I doubt not, will delight the eye and sense of the fair, as long as that agreeable

machine shall play in the hands of posterity.”²¹ The machine Pope describes is no longer merely an ephemeral toy but rather a celebrated and enduring textual technology.

The Restoration and eighteenth-century authors who alternately described the fan as a machine and mocked it as a trifle show us a number of the ways in which technological objects and processes functioned and signified during the period. This collection of texts demonstrates how a technological ingenuity associated with martial, perceptual, and intellectual domination became increasingly important to eighteenth-century constructions of masculinity. This mechanized ingenuity was buttressed by its contrast with and rejection of an ornamental, feminized material culture marked as trivial, ephemeral, and non- (indeed, anti-) technological.²² At the same time, objects that extended and altered the body’s capacities disrupted conventional ways of understanding embodied experience (regardless of whether these objects were recognized as technological or, in the case of the fan, denied access to that category). The way the fan functions in relation to women’s bodies in Gay’s poem suggests how this disruption opened spaces for the remaking and redefinition of embodiment itself. As we see from Addison’s disciplining Academician, Atterbury’s pen, and Gay’s analyzing gaze, however, this potential was met by forces that sought to apprehend, redefine, and control it. These acts of apprehension trace along the fan’s leaves a new model of interiorized subjectivity. Moreover, the texts signal how technologies were crucial both to

²¹ Pope, “Letter III: Aug. 23, 1713,” in *The Works of Alexander Pope Esq* (London: A. Millar, R. Tonson, et al, 1757), 8:108-9, ECCO (CW3311937621).

²² The fact that the fan was a consumer object originating in and associated with the east is not incidental; as my fourth chapter explores, across the century categorizing eastern products and production techniques as anti-technological became increasingly important to a British nationalism itself rooted in technological ingenuity.

constructing this nascent interiority and to decoding it. The fan's fluttering screen, the pen's mark, and the camera obscura's mechanized eye concatenate to produce a woman perpetually needing to be deciphered once more.

While analysing Gay and Addison's mockery of the fan is instructive, then, taking the fan itself seriously as a technology allows us to go further, pushing us to consider what is invested in the category of "the technological," and how it functions materially and discursively in relation to the subjects who deploy it. By rethinking what eighteenth-century technologies were and how they functioned, my project joins and reframes a growing critical conversation about eighteenth-century technology and its meanings. A key text in this conversation, both for eighteenth-century literary studies in general and for this dissertation, is Steven Shapin and Simon Schaffer's *Leviathan and the Air Pump*, which reconceived the relationship between material practice and intellectual endeavour through its analysis of Restoration controversies over scientific experimentalism. Choosing the air-pump as an emblematic object in this history, Shapin and Schaffer describe not simply its material functions, but also how these functions were taken up by Royal Society natural philosophers who made it the lynchpin of a conceptual system that produced empirical "matters of fact" and a new kind of subject—the "modest witness" that observed them. One of the important insights of *Leviathan and the Air-Pump* is its description of how a technological object works at once materially and discursively. Shapin and Schaffer emphasize that the air-pump was effective only in the context of the accompanying "literary technology" of published scientific proceedings and the "social technology" of gathering to perform and collectively verify experiments and their

findings; as they show, these three operations were inseparable.²³ Jonathan Crary uses similar language in *Techniques of The Observer*, when he contends that each of the optical technologies he discusses in his work “is understandable not simply as the material object in question, or as part of a history of technology, but for the way in which it is embedded in a much larger assemblage of events and powers.”²⁴ Like Shapin and Schaffer (but with a more explicitly Foucauldian critical framework), Crary pushes us to see technological objects not in isolation but instead as “points of intersection where philosophical, scientific, and aesthetic discourses overlap with mechanical techniques, institutional requirements, and socioeconomic forces” (8). My work is indebted to this model of technology, but I extend it by foregrounding how the operations of gender are implicated within and produced by it. In both *Leviathan and the Air-Pump* and Crary’s chapter on the camera obscura, analyses of the subject positions constructed alongside technological objects do not focus on gender, and thus present the modest witness/observer as implicitly and uncritically male.²⁵ I argue, across the first two chapters of this dissertation in particular, that the construction of a masculine empirical subjectivity and its opposite (or object) is a foundational part of the technological operations so described. My work therefore attends to this process of construction, and to what is discarded, obfuscated, or violated in order to make it possible.

²³ Shapin and Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton: Princeton University Press, 1985), 25.

²⁴ Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge: MIT Press, 1990), 8. References are to this edition.

²⁵ Shapin later explored some of the gendered implications of the modest witness (though not in relation to technology) in “The House of Experiment in Seventeenth-Century England,” *Isis* 79, no. 3 (1988): 373-404, <http://www.jstor.org/stable/234672>.

Another work important to this study is Allison Muri's *The Enlightenment Cyborg*, which situates contemporary cyborg theory in the historical context of the enlightenment philosophy it often cursorily calls on but usually misrepresents. As she recontextualizes this theory with careful research, Muri argues that the cyborg has "metaphorical precursors to be found in the early modern man-machine."²⁶ While my work is not organized around the figure or theory of the cyborg, the way Muri traces image patterns like the "man-machine" across a variety of genres and national contexts during the period has been immensely helpful for my understanding of the field. Where I differ from Muri even more strongly than in her orientation towards contemporary cyborg theory, however, is in her assertion that "the female machine is almost entirely absent from the anatomical, philosophical, or fictional literature" of the long eighteenth century (178). While Muri finds some exceptions in satires of female fashions that deride them as prosthetic parts, and in medical literature that describes human reproduction as a mechanical process, she still asserts that the "female machine" is a "nonexistent" figure at this historical moment (225). My work argues instead that the identification of women, and especially of women's embodied experience, with technological objects and processes is a constitutive element of eighteenth-century understandings of gender difference, and of the history of technological invention during the period. I locate these intimacies between women and machines not in works that explicitly purport to describe a "female machine," but rather in clusters of imagery that evidence the feminization of

²⁶ Allison Muri, *The Enlightenment Cyborg: A History of Communications and Control in the Human Machine, 1660-1830* (Toronto: University of Toronto Press, 2007), 87. References are to this edition.

machinery and the mechanization of femininity: in the way Richardson uses clockwork imagery to describe Clarissa as desired by Lovelace (in a manner echoing philosophical descriptions of analysis as the taking apart of a clock), for example, or the way textile technology was developed to mimic, abstract, and finally replace the spinster's labouring body. While women were no less completely identified with machines than machines were with women, my readings across the following chapters argue that the ideas "female" and "machine" are defined in relation to each other over the course of the long eighteenth century.

A number of other critical works have explored the relationship between technology, embodiment, and subjectivity in eighteenth-century literature. Much of this work can be seen as part of the recent turn towards material culture as a site and means of analysis in eighteenth-century studies. That Bill Brown's touchstone collection *Things* includes Jessica Riskin's 2003 article "The Defecating Duck, or, the Ambiguous Origins of Artificial Life" (which interrogates how the mimetic automata constructed by eighteenth-century artisans sought out the shifting "outer bounds of mechanism" in order to redefine what constitutes organic life) suggests how important eighteenth-century technologies are to theories of material culture, and how thing theory has helped us understand eighteenth-century technologies in new ways.²⁷ My work draws on the insights of material culture studies to consider how technology functions as a particular kind of *thing*: a thing that mediates between the embodied subject and the world, and thus

²⁷ See Riskin, "The Defecating Duck, or, the Ambiguous Origins of Artificial Life," in *Things*, ed. Bill Brown, 99-133 (Chicago: Chicago University Press, 2004).

redefines both in relation to itself. In my attention to how technological things work in eighteenth-century literature, I follow Deidre Lynch, Julie Park, and Joseph Drury, who have shown us the vital interrelations between technologies and the new forms of fiction and of selfhood that emerged across the long eighteenth century. In *The Economy of Character*, Lynch points out that the concept of “character” is linked to “the material supports of meaning in a literate culture” through its connotation of typographical symbols: she quotes Daniel Defoe explaining that characters are “types impressing their Forms on Paper by Punction or the Work of an Engine” to emphasize how the creation of fictional character is a technological process.²⁸ Lynch develops this analysis in her chapter on Frances Burney, in which she compares Burney’s ambivalent representations of female characters to the automatons that “transmitted a compelling spectacle of activity severed from agency” and thus equivocated on the border between subject and object (192). Park, in *The Self and It*, explores how selfhood is formed in relation to material culture in the eighteenth-century novel, arguing that the genre, “situating itself in these conflicts between self and object and mind and machine, produced the self not only as a textual construct, but as a deeply material and even mechanical one.”²⁹ Like Lynch, Park turns to Burney’s fiction to trace the relationship between women, fiction, and machines, extending Lynch’s observations to contend that eighteenth-century automata, as artificial, automated objects, provided a model for both virtuous female subjectivity and the novel’s techniques of producing fictional people. Drury has likewise analyzed the

²⁸ Lynch, *The Economy of Character: Novels, Market Culture, and the Business of Inner Meaning* (Chicago: University of Chicago Press, 1998), 30-31. References are to this edition.

²⁹ Park, *The Self and It: Novel Objects in Eighteenth-Century England* (Stanford: Stanford University Press, 2010), xvii-xix.

novel's technologies in articles on Eliza Haywood, Laurence Sterne, and Henry Fielding.³⁰ Across his work, Drury has attended to the machinery of novelistic form, and to how developments in the genre's form (and the gendered subjectivity it both recorded and produced) are linked to its authors' engagements with mechanistic materialism, technological empiricism, and automatic objects.

Lynch, Park, and Drury's work, alongside a growing body of literary and historical work on eighteenth-century technologies,³¹ has become increasingly important to critical understandings of fictional form, material culture, and subjectivity during the period. Certain preoccupations, however, have characterized this nascent field of study: these scholars, along with the others who have recently contributed to our understanding of eighteenth-century technologies, have concentrated on the novel, on mimetic automatic mechanisms, or on the relationship between the two. While the alliances between automatic mechanism, the novel, and gendered subjectivity are, as I explore in my chapter on clockwork in *Clarissa*, important to any understanding of technology in

³⁰ See Drury, "Haywood's Thinking Machines," *Eighteenth-Century Fiction* 21, no. 2 (2008-9): 201-228, doi: 10.1353/ecf.0.0044; "The Novel and the Machine in the Eighteenth Century," *Novel: A Forum on Fiction* 42, no. 2 (2009): 337-342, doi: 10.1215/00295132-2009-02; and "Realism's Ghosts: Science and Spectacle in *Tom Jones*," *Novel: A Forum on Fiction* 46, no. 1 (2013): 50-72, doi: 10.1215/00295132-2019110.

³¹ See, for example, Bonnie Blackwell, "Tristram Shandy and the Theatre of the Mechanical Mother," *ELH* 68, no. 1 (2001): 81-133, <http://www.jstor.org/stable/30031960>; Tita Chico, "Minute Particulars: Microscopy and Eighteenth-Century Narrative," *Mosaic* 39, no. 2 (2006): 143-161; Christopher Loar, "How to Say Things with Guns: Military Technology and the Politics of Robinson Crusoe," *Eighteenth-Century Fiction* 19, no. 1-2 (2007): 1-20, doi: 10.1353/ecf.2006.0085, and "The Exceptional Eliza Haywood: Women and Extralegality in *Eovaai*," *Eighteenth-Century Studies* 45, no. 4 (2012): 565-584, doi: 10.1353/ecs.2012.0062; Alex Wetmore, "Sympathy Machines: Men of Feeling and the Automaton," *Eighteenth-Century Studies* 43, no. 1 (2009): 37-54, doi: 10.1353/ecs.0.0083; Minsoo Kang, *Sublime Dreams of Living Machines: The Automaton in the European Imagination* (Cambridge: Harvard University Press, 2010); Kara Reilly, *Automata and Mimesis on the Stage of Theatre History* (London: Palgrave Macmillan, 2011); and Adelheid Voskuhl, *Androids in the Enlightenment: Mechanics, Artisans, and Cultures of the Self* (Chicago: University of Chicago Press, 2013).

the eighteenth century, this project moves beyond realist fiction and imitative mechanism to consider other forms. By analyzing the collaborations between text and technology in genres such as farce, pornography, and political pamphlets, and with objects like painted stage flats, magic lanterns, quill pens, and the non-automatic spinning jenny, I reframe the discussion of literature and technology by questioning what we assume about these categories during the century that is thought to have defined them. Focusing mainly on automatic mechanisms in these discussions uses a forward-looking definition of technology linked with the machines that would power industrial modernity through the nineteenth century. Jonathan Sawday identifies this difficulty, one inherent to analyzing early technologies, in the preface to *Engines of the Imagination*, noting that “our sense of the symbolic significance of pre-industrial machines is inevitably coloured by the fact that they have been consigned to what has sometimes been termed the ‘paleotechnic’ age,” and that, “surrounded as we are in the modern age by far more powerful, subtle, or transformative machines, the imaginative force of early-modern mechanisms easily escapes us.”³² Sawday’s account of sixteenth- and seventeenth-century mechanisms is one that challenges this assumption (itself a product of the industrial revolution) that the early modern past was pre-technological. By using a definition of technology rooted in embodiment—that technological objects or processes are those that extend, alter, or instrumentalize the body’s capacities—this project responds to Sawday’s challenge. My definition of technology is one that enables me to explore the odd and obsolete devices

³² Jonathan Sawday, *Engines of the Imagination: Renaissance Culture and the Rise of the Machine* (New York: Routledge, 2007), xvi-xvii.

left behind in modernity's push towards the future, and thus allows me to delineate a critical history of technology that moves beyond an implicitly teleological *prehistory* of later innovations. Likewise, by looking beyond the novel and its rise in this project, I find a multiplicitous collection of experiences and techniques through which embodied subjects are constituted in the eighteenth century: processes that are often mediated by text, but not necessarily by the mimetic representation in it of an artificial life.

This attention to sources beyond novelistic fiction—and to extratextual practices of experiment, performance, and material display—is evident in my first chapter, in which I explore the relationship between optical technologies like the telescope and microscope and the spectacular stage machinery that concurrently proliferated upon the Restoration stage. I argue that Aphra Behn's 1687 farce *The Emperor of the Moon*, often dismissed as a lightweight entertainment staged largely to exploit the capacities of London's Dorset Garden Theatre, in fact uses the theatre's stage technologies to mount a sophisticated critique of new scientific practices and optical techniques. Binding the virtuoso's scenes of empirical discovery to the "discovery scenes" recently enabled by the introduction of changeable scenery to the English stage, Behn's staging resituates his technologically-mediated revelations, embedding them within the kind of spectacular materiality that Royal Society fellows attempted to reject as they sought cultural and intellectual legitimacy. Drawing on the same supposed distinction between men's technological ingenuity and women's trifling, ornamental materiality as Addison and Gay's satires of the fan, Behn's sharp critique uses the staged female body and the mechanisms of trivial material display associated with it to disrupt the purportedly

transparent function of empiricist perception. Behn's play, I contend, ultimately enacts a radical revision of experimental empiricism by privileging experiences of spectacular materiality as sites of knowledge. Through *The Emperor of the Moon's* extravagantly staged discoveries, Behn constructs a perceptual technology out of the materials cast off by the modest witness, celebrating as she does so the feminized "gloss'd outside Fallacies"³³ his new scientific optics both renounced and promised to penetrate.

In my second chapter, I extend this analysis of empiricism, gender, and technological objects by tracing the afterlife of Restoration mechanical philosophy in Samuel Richardson's *Clarissa*. Reading outward from Lovelace's fantasy, expressed near Clarissa's death, that she is a "charming clock," I contend that Clarissa's interiority is conceptualized by both Lovelace and Richardson as fundamentally technological. Analysing the novel in the context of new scientific treatises that used the clock—and, in particular, the deconstructed clock—as a metaphor for a systematized natural world newly available for the natural philosopher's mastery, I resituate Lovelace's desire (and the desired object it constructs) in this tradition of mechanical objectification. While Richardson repudiates Lovelace's drive to see and master Clarissa's "secret recesses," Richardson's descriptions of her embodied virtue as an automatic, clock-like function (which rewrite the passionate heart into a virtuous, sensible bourgeois one) show him performing the same conceptual maneuver. Likewise, descriptions of Richardson as a clockmaker by both Samuel Johnson and Richardson himself show us how the work of

³³ Henry Power, *Experimental philosophy, in three books containing new experiments microscopical, mercurial, magnetical* (London: T. Roycroft, 1664), 18, Early English Books Online (hereafter EEBO).

reproducing nature's functions with artificial contrivances—that is, the work of making mimetic fictions—is itself linked with the clockwork image of a mechanically structured, legible interior. The projects of despoiling and describing Clarissa's virtue are therefore linked, I argue, through a technologizing vision that defines both a feminized, mechanical object of knowledge and its masculine author-interpreter. Like the lady with the fan, however, Clarissa is not so easily deciphered.

In my third chapter I turn from the mid-century novel to its perverse double: John Cleland's pornographic *Memoirs of a Woman of Pleasure*. I focus here on the technologies of textual production represented and allegorized in the *Memoirs'* descriptions of sex. First I outline how the writing body is implicated in the erotic experiences it composes, arguing that epistolary technologies—in particular, the pen—activate and sustain the text's representations of sexual pleasure. Reading Cleland's smut in conjunction with penmanship manuals and other eighteenth-century depictions of penmanship, I show how the pen functioned as a sexualized supplement of the writing body, one that destabilized nascent binary definitions of gendered embodiment and perverted attempts to discipline the body into coherence. The *Memoirs'* symbolic representations of print technologies are likewise sexualized, but link the process of making printed text to violent compulsion and generic repetition. Unlike the pen, the printing press fixes the female body to the page with a reproducible consistency, translating it into an object available for consumption and, implicitly, violation. Cleland's text is perverse, I argue, because its technologically-supplemented bodies are able to exceed and refuse binary definitions of gender. This fantasy is ultimately unsustainable,

however, and the *Memoirs* closes by representing the coherently-gendered body as a functional part in capitalist systems of production and consumption.

My final chapter moves from this observation to analyse one such system, and the bodies it used and defined. Rereading the mechanization of the British cotton industry through the lens of my dissertation's argument, I show how this material process was supported by an ideological one that bound technological ingenuity to the progress of nations, and made "civilization" contingent on the use of technological supplements. This discursive project, which I trace in political pamphlets written on the cotton industry, marked Indian textile workers as pre-technological, so making their labour at once unproductive and invisible. I then turn to analyse spinning as a key labour in both the material and discursive project of mechanization, since spinning was the first aspect of textile processing to be successfully and lucratively mechanized, and, in transforming raw natural material into a valuable commercial product, came metaphorically to represent the culturing process. I read descriptions of early spinning machineries, and analyse the machineries themselves, to show how these technologies replicated and abstracted the labour of British spinsters. While textile mechanization depended in multiple ways on women's labour, the discursive link between ingenious technologies and state power meant that the spinster's body was emptied of force and meaning except in conjunction with the machines that appropriated its abilities. The spinster's labouring body, abjected in service of a mechanizing state, ultimately acts as a vector for anxieties about that state's dependence on technological supplements to produce and reproduce its superiority.

Technology's relationship with the body is close: it can assume its form and motions, extend its force, and mediate its experiences of the world. And yet, at the same time, technological objects are utterly alienated from the body, as its fabricated supplements or surrogates. Through careful readings of texts and technologies, my dissertation explores how this odd collection of objects, at once intimate with and estranged from the self, was constitutive of new forms of embodied subjectivity. In doing so, I contend that the boundaries of modern gender difference were constructed along with and out of the body's most artificial parts.

CHAPTER 1

True Spectacles: Optical Technologies in Restoration England

When London's public theatres reopened after Charles II's restoration to the throne, things looked different: there were only two playhouses, and the old companies' boy actors had, with a Continental flair typical of the cavalier monarch, been replaced by female actresses. In another major break from the pre-civil-war public stage, the new theatres used changeable scenery, along with an increasingly spectacular array of scenic effects, to present both new plays and revivals of Tudor and early Stuart productions. These innovations, drawn from Continental and English court theatre traditions, fundamentally altered the possibilities of theatre space and dramatic action, and, as Elin Diamond has argued, "introduced a new scopic epistemology" in the public Restoration playhouse.¹ The theatre was hardly the only location of such scopic revolutions. At Gresham College and beyond, optical technologies like the microscope and the telescope radically modified perceptual capacities and imaginative possibilities, and became essential to the wider cultural project of producing empirical knowledge. Following Joseph Roach's suggestion that the Restoration stage functioned as "an instrument closely analogous to contemporary optical instruments" in its restructuring of "vision, knowledge, and conquest in their relationships to technology,"² this chapter explores the links between Restoration natural philosophy and stagecraft as visual experiences mediated by technological objects. Exactly how this mediation acted upon the observer it

¹ Elin Diamond, "Gestus and Signature in Aphra Behn's *The Rover*," *ELH* 56. no. 3 (1989): 521, <http://www.jstor.org/stable/2873196>.

² Joseph Roach, "The Artificial Eye: The Augustan Theatre and the Empire of the Visible," in *The Performance of Power: Theatrical Discourse and Politics*, ed. Sue-Ellen Case and Janelle G. Reinelt (Iowa City: University of Iowa Press, 1991), 143, 134.

engaged (and whether this action was desirable) remained an open question. Did optical technologies extend or confuse perception? Did they produce new knowledge or simply new fantasies? Were the technologies themselves necessary supplements or trivial ornaments? Across the following pages, I read Aphra Behn's 1687 farce *The Emperor of The Moon* as both a document and an interrogation of this controversy. In doing so, I explore how technologies of optical mediation became key to the production of new modes of perception, gendered embodiment, and subjectivity in Restoration England.

Telescopes, trinkets, knacks, and gimcracks

The Emperor of the Moon (hereafter *Emperor*) was adapted from the Italian farce performed and published in France three years earlier as *Arlequin empereur dans la lune*, from which Behn took, as she notes in the epistle dedicatory, a "very barren and thin hint of the plot"; as Jane Spencer shows, Behn's version of the play contains a number of scenes not present in the original entertainment, and demonstrates a "narrative unity not evident" in the printed French episodes, though it retains the *commedia dell'arte* characters and tropes and the farcical tone of the French/Italian production.³ *Emperor* tells the story of Doctor Baliardo, a credulous natural philosopher whose particular obsession is the moon, the sovereign of which he believes he can discern through his telescope. Baliardo and his moon-madness stand in the way of two prospective suitors, Don Cinthio and Don Charmante, who have designs on the doctor's daughter and niece, Elaria and Bellamante. In a bid to at once gain Baliardo's consent for their suits and cure

³ Aphra Behn, *The Emperor of the Moon*, in *The Rover and Other Plays*, ed. Jane Spencer (1687; Oxford: Oxford University Press, 1995), 274n378. References are to the act, scene, and line numbers of this edition.

him of his misapprehensions, and aided by Scaramouch and Harlequin (the stock *commedia dell'arte* figures who appear as Baliardo and Cinthio's manservants, respectively), Cinthio and Charmante stage an intricate farce for the doctor. In it, they appear as Iredonozar, the titular lunar emperor, and his brother, the Prince of Thunderland, two Rosicrucian spirits who have purportedly bestowed upon Elaria and Bellamante the honour of their affections. The scheme and the play simultaneously culminate in a series of opulent set pieces representing the supposed moon-royalty's descent to earth and marriage to their sweethearts; after the marriage ceremony, the trick is revealed to Baliardo and he repudiates the "[r]idiculous inventions" that formerly animated his fantasies (3.3.218).

The play premiered at Dorset Garden Theatre in early 1687. The location is significant: Dorset Garden, originally built for Thomas Betterton and the Duke's Company in 1671, had been conceived of and designed in order to accommodate the most elaborate stage technologies available at the time. The completed structure hosted a series of plays Judith Milhous calls "Dorset Garden spectacles"—entertainments that brought changeable scenery, flying machines, lighting and sound effects, dance, song, and performance together into a coordinated experience of sensory ostentation.⁴ *Emperor's* third act marks it as one of these spectacles, and, as Milhous notes, the play was "obviously written to capitalize on the staging capacities of Dorset Garden."⁵ *Emperor*, however, was the only one of Behn's 19 plays to use these kinds of flamboyant scenic

⁴ Judith Milhous, "The Multimedia Spectacular on the Restoration Stage," in *British Theatre and the Other Arts, 1660-1800*, ed. Shirley Strum Kenny (Washington: Folger, 1984), 41-66.

⁵ Milhous, 43.

effects. As part of the *oeuvre* of an author who, as many critics have noted, was critically engaged with the capacities of stage representation across her career,⁶ *Emperor* emerges as a play particularly concerned with technologies of spectacle: those technologies that modified viewers' perceptual experience in conspicuous ways.⁷

As my brief summary of the *Emperor* above indicates, this interest in perception—particularly visual perception—and the technologies that act upon it operates at the level of plot as well as of staging. Baliardo is, even before he appears on the stage, associated with an array of optical instruments. As Scaramouch explains the suitors' scheme to Elaria in the first scene, informing her that Charmante will soon visit Baliardo in the habit of a Rosicrucian cabalist, he tells her also that he has ready Baliardo's "trinkets here to play upon him" (1.1.114-115). The reference seems vague until, ten lines later, Elaria's governess Mopsophil enters to warn Scaramouch that Baliardo is calling for him: "Run, run, Scaramouch; my master's conjuring for you like mad below: he calls up all his little devils with horrid names, his microscope, his horoscope, his telescope, and all his scopes" (1.1.124-126). Mopsophil's description humorously links Baliardo with the great alchemical-occultist stage heroes (and sometime buffoons) of the sixteenth and early seventeenth century, such as Doctor Faustus and Friar Bacon, casting Baliardo's instruments as minor Mephistophelean demons ready to do his bidding. At the

⁶ See, for example, Derek Hughes, *The Theatre of Aphra Behn* (New York: Palgrave, 2001), and Dawn Lewcock, "More for Seeing than Hearing: Behn and the Use of the Theatre" in *Aphra Behn Studies*, ed. Janet Todd (Cambridge: Cambridge University Press, 1996), 66-83.

⁷ In a reading that recognizes and differently explores the way the play "offers a careful interrogation of spectacle," Al Coppola connects *Emperor*'s scenic magnificence to the political spectacles mounted in the midst of the Exclusion Crisis in London. See "Retraining the Virtuoso's Gaze: Behn's *Emperor of the Moon*, The Royal Society, and the Spectacles of Science and Politics," *Eighteenth-Century Studies* 41, no. 4 (2008): 481-506, doi: 10.1353/ecs.0.0007.

same time, and in contrast, Baliardo's complement of technologies marks him as a notably modern natural philosopher, adducing knowledge through "all his scopes" rather than occult ceremonies.⁸ More to the point, however, as the subject of Scaramouch's jesting reference to the doctor's "trinkets," Baliardo's collection of scopic technologies is marked as so many trivial objects—"small ornament[s] or fancy article[s]"—of little more than decorative value in themselves, and easily turned to the task of duping their operator.⁹

The status of Baliardo's instruments as trinketry is emphasized in the next scene, as the doctor makes his first entrance. The stage direction bringing him out reads, "*Enter Doctor, with all manner of mathematical instruments hanging at his girdle; Scaramouch bearing a telescope twenty (or more) foot long*" (1.2.1). Adorning Baliardo, his instruments first appear onstage not as useful tools but instead as an array of accessories. Divorced from their function as implements to enhance the doctor's perception, they become ornamental objects. Acting primarily as gaudy signs of Baliardo's participation in natural philosophical endeavours, these fancy articles intimate the triviality of this participation and, perhaps, of the endeavours themselves. Attending him, the doctor's immense telescope elaborates this visual joke in a number of ways. Its huge size might at

⁸ As Jane Spencer's note shows, Baliardo's "horoscope" could either reference the ancient practice of interpretive astrology, or "a more modern, mathematical instrument, a kind of planisphere," that is, a tool that indicated the position of the stars relative to the date. Given Baliardo's interest in the moon and the context, the latter seems more likely, but the reference may oscillate between the two definitions in order to emphasize Baliardo's position in transition between the old and new sciences, which of course were not neatly separated out or conceived of as antithetical in seventeenth-century practice. Baliardo's interest in Rosicrucianism and alchemy give him his own kind of occultist flair.

⁹ Emphasizing this turn, "trinket," in a verb form used through the seventeenth and eighteenth centuries, itself connoted trickery and deceit: see Eugenia Zuroski Jenkins, "Defoe's Trinkets: Fiction's Spectral Traffic" in *A Taste for China: English Subjectivity and the Prehistory of Orientalism* (Oxford: Oxford University Press, 2013), especially 114-115.

first seem to distance it from the insignificance imputed to Baliardo's other instruments—at twenty feet long, the telescope would have stretched across at least two-thirds of the Dorset Garden stage¹⁰—but the elaborate trick Scaramouch and Charmante are about to perform using the telescope marks it as the principal “trinket” with which Baliardo will be “play[ed] upon.”¹¹ The telescope's other qualities further articulate its affinity with the rest of the doctor's trinketry. The most extravagantly scopic of Baliardo's instruments, the telescope is also the most emphatically material: a showy object, it is designed to impress, and meant to be looked *at* as much as looked through. Like the little implements dangling from Baliardo's girdle, the telescope enters the playing space primarily as a material sign of his investment in new scientific practices, and, in an even more spectacular manner than the rest of his collection, this materiality comes to supersede its purported use as a rational technology of observation. As an article of “personal adornment”¹² and dubious functional value, the telescope is cast as a kind of epic trinket, its exaggerated size only highlighting the mechanism's essential triviality and its owner's perceptual impotence. As an outsized phallic object, it is notably impotent too. A supplement meant to consolidate and conspicuously assert the masculine subject's power within a new model of empirical masculinity that casts this power as optical, Baliardo's telescope instead stages the failure of this technological phallus. Exaggerated to the point

¹⁰ For the probable dimensions the stage, see Frans Muller, “Flying Dragons and Dancing Chairs at Dorset Garden: Staging *Dioclesian*,” in *Theatre Notebook* 47, no. 2 (1993).

¹¹ I will discuss the trick itself at length in the next section of this chapter; for now it is enough to know that it occurs soon after Baliardo's entrance here, and is effected through the telescope.

¹² *Oxford English Dictionary Online*, s.v. “trinket, n.1,” last modified March 2013, <http://www.oed.com/view/Entry/206184>.

of ludicrousness, the instrument diminishes the body it was meant to extend, converting it instead into an object of ridicule.

Behn's satire here is animated by its place in a continuing dispute about the value of scientific instruments, and of optical instruments in particular. Scientific instruments famously acted as both the cornerstone of and emblem for the philosophical endeavours undertaken by the Royal Society of London for Improving Natural Knowledge, incorporated in 1660.¹³ The Society's method of improving knowledge hinged on improving the natural philosopher's ways and means of observing the world, and optical instruments exemplified the possibilities the Society found in empirical investigation. Robert Hooke, whose wildly successful *Micrographia* (1665) would transform microscopy from esoteric pursuit to popular diversion, devotes much of that text's preface to his excitement about what optical instruments enabled for their operators. Hooke locates the invention of optical technologies in a history of humankind's (or, in his construction, mankind's) capacity "of *considering, comparing, altering, assisting, and improving*" the natural world: activities, he contends, which distinguish humans from animals, as well as from each other, since "the helps of Art, and Experience...make some Men excel others in their Observations, and Deductions, almost as much as they do Beasts."¹⁴ This devotion to improvement, Hooke contends, is a salvation in the postlapsarian world, in which "a reparation...for the mischiefs, and imperfection,

¹³ See Shapin and Shaffer, *Leviathan and the Air-Pump*, for the classic account of the Society's investment in scientific instruments.

¹⁴ Robert Hooke, *Micrographia, or, Some physiological descriptions of minute bodies made by magnifying glasses with observations and inquiries thereupon* (London: Martyn and Allestry, 1665), v, EEBO. References are to this edition.

mankind has drawn upon itself” can be made by “the addition of...*artificial instruments* and *methods*” (v).¹⁵ More to the point, Hooke argues that the “only way which now remains for us to recover some degree of those former perfections, seems to be, by rectifying the operations of the *Sense*, the *Memory*, and *Reason*” (v), a process that depends on recognizing the inherent weakness of these faculties and “supplying of their infirmities with *Instruments*, and, as it were, the adding of *artificial Organs* to the *natural*” (vii). For Hooke, optical technologies demonstrate the truth of his claims, as the sight’s reparation “has been of late years accomplisht with prodigious benefit to all sorts of useful knowledge, by the invention of Optical Glasses” (vii-viii).¹⁶ In his *Experimental Philosophy* of 1664, Henry Power similarly celebrates the way in which optical technologies, as instrumental organs, extend human apprehension, asking rhetorically,

[h]ow much...are we oblig’d to modern Industry that of late hath discover’d this advantageous Artifice of Glasses, and furnish’d our necessities with such artificial Eys, that now neither the fineness of the Body, nor the smallness of the parts, nor the subtilty of its motion, can secure them from our discovery?¹⁷

¹⁵ Joseph Glanvill, another Society member and contemporary of Hooke’s, similarly associated technological (and specifically optical) instruments with an Adamic perceptual capacity, writing in 1661’s *The Vanity of Dogmatizing* that “Adam needed no Spectacles. The acuteness of his natural Opticks (if conjecture may have credit) shew’d him much of the Cœlestial magnificence and bravery without a *Galilæo’s* tube: And ‘tis most probable that his naked eyes could reach as much of the upper World, as we with all the advantages of art.” Glanvill is quoted in Joad Raymond’s *Milton’s Angels: The Early Modern Imagination* (Oxford: Oxford University Press, 2010), 295, Oxford Scholarship Online, doi: 10.1093/acprof:oso/9780199560509.001.0001. As Raymond shows, these natural philosophical ideas are incorporated into Milton’s *Paradise Lost* in passages such as his comparison of the angel Raphael’s vision of the earth from heaven to how, “by night the glass / Of Galileo, less assured, observes / Imagined lands and regions of the moon” (299). I will discuss the implications of this utopian, Adamic assessment of technological supplements in more detail in chapter 4.

¹⁶ Though Adam and Raphael did not need spectacles, Hooke did: as Barbara Benedict points out, he relied on thick glasses. See *Curiosity: A Cultural History of Early Modern Inquiry* (Chicago: University of Chicago Press, 2001), 67. This fact may have influenced his excitement about the reparative power of optical technologies.

¹⁷ Power, xv-xvi. Power, however, did not concur with Hooke and Glanvill that such instruments returned man’s faculties to a prelapsarian state, writing that “certainly the Constitution of *Adam’s* Organs was not divers from ours, nor different from those of his Fallen Self” (iii).

A few years later, Joseph Glanvill echoes Power and Hooke in *Plus Ultra* (1668), a history of natural philosophy in which he posits that the Royal Society is this history's pinnacle. Describing the Society's methods for producing knowledge, he explains that

*Instances must be aggregated, compared, and critically inspected, and examined singly and in consort. In order to which Performances, our Senses must be aided; for of themselves they are too narrow for the vastness of things, and too short for deep Researches: They make us very defective and inaccurate Reports, and many time very deceitful and fallacious ones. I say therefore, they must be assisted with Instruments that may strengthen and rectifie their Operations.*¹⁸

These instruments, Glanvill believes, give modern natural philosophers significant advantages over their predecessors, and even over ancient giants of natural knowledge like Aristotle, for “a *weak hand* can move more *weight* by the help of *Springs, Wheels, Leavers*, and other *Mechanick Powers*, than the *strongest* could do without them.” (53). Hooke, Power, and Glanvill, all affiliated with the Royal Society, are likewise joined in their conviction that optical technologies offer a means to enhance the human body, and its capacity for rational knowledge, by artificially extending them. Allied with these instruments, the seventeenth-century man of science is granted a physical, perceptual, and intellectual power unprecedented since, at least, the days of Adam.

Though these philosophers and their contemporaries theorized that instruments like the telescope and microscope functioned as organs of the investigator's body, it was the instruments' difference from that body—their artificiality—that promised to correct the “errors and falsehoods, in which the greatest part of mankind has so long wandred,

¹⁸ Joseph Glanvill, *Plus ultra, or, The progress and advancement of knowledge since the days of Aristotle in an account of some of the most remarkable late improvements of practical, useful learning, to encourage philosophical endeavours* (London: James Collins, 1668), 52-53, EEBO. References are to this edition. The five technologies Glanvill chooses to illustrate his point are the telescope, the microscope, the thermometer, the barometer, and the air-pump (53).

because they rely'd upon the strength of humane Reason alone."¹⁹ It was this artificiality that, as Shapin and Schaffer have shown, allowed scientific technologies to stand "between the perceptual competences of a human being and natural reality itself," and thus to produce facts about that reality in a way that was deemed "impersonal." While Shapin and Schaffer focus on Robert Boyle's air-pump (constructed, like many of the Society's instruments, by Hooke), it was far from the only instrument to function in this way, as an "objectifying resource."²⁰ In his work on the camera obscura, Crary describes how seventeenth- and eighteenth-century optical technologies performed this objectifying function by offering a visual experience in which "the observer's physical and sensory experience" was "supplanted by the relations between a mechanical apparatus and a pre-given world of objective truth."²¹ While the viewer was positioned as "disjunct from the pure operation of the device" and as a mere witness to its "mechanical and transcendental re-presentation of the objectivity of the world," this act of witnessing also implied "a spatial and temporal simultaneity of human subjectivity and objective apparatus."²² The optical instrument's mediating function was understood, like the air-pump Shapin and Schaffer describe, to "factor out human agency"²³ in the knowledge it produced, while simultaneously granting its operator's perception a mechanical accuracy mirroring that of the device. In this way, optical technologies were a key tool in producing the investigative, empirical subject named by Shapin and Schaffer the "modest witness." This

¹⁹ Hooke, *Micrographia*, xxxi.

²⁰ Shapin and Schaffer, 77.

²¹ Crary, 40. Crary's argument, of course, is about the camera obscura, but the process he describes here clearly characterizes the function of other, contemporaneous optical instruments.

²² Crary, 41.

²³ Shapin and Schaffer, 77.

figure was, as Tita Chico describes, “a gendered figure of authority, gentility, and privilege” whose legitimacy was “borne out of performance, policing, and collective agreement,” but also “depended upon the idea that these practices produced a...witness who merely reflected the results from scientific experimentation.”²⁴ Chico’s use of the term “reflected” to describe the productive effects of empirical, experimental practices is indicative of how the dynamics and language of optics came to structure this process.

It was against this modest witness, his array of instruments, and the supposed purity of his artificially-augmented perception that a number of Restoration satires (Behn’s *Emperor* among them) mercilessly raged, articulating a mordant counter-argument about the value of scientific technologies. One of the most ruthless of these satires was Thomas Shadwell’s *The Virtuoso* (1676), a play that stands as an important context for Behn’s representation of Baliardo and his trinkets.²⁵ In it, Shadwell lampoons the titular virtuoso, Sir Nicholas Gimcrack, whose philosophical pastimes include collecting bottles of English country air (which are duly weighed and stored in his vault) and learning to swim “*upon a table*,” with the guidance of a frog and a swimming master (asked whether he plans to practice in water, Gimcrack explains that he is content to explore “the speculative part of swimming”).²⁶ Gimcrack’s follies may seem impossibly ludicrous, but most are firmly grounded in their cultural context. Many episodes in the

²⁴ Tita Chico, “Gimcrack’s Legacy: Sex, Wealth, and the Theatre of Experimental Philosophy,” *Comparative Drama* 42, no. 1 (2008): 29-49, 29, <http://www.jstor.org/stable/23038077>.

²⁵ The title of Shadwell’s play offers us another, less flattering label for the Restoration man of science. While the term virtuoso “originally had positive associations, referring to a man of learning,” in the 1660s it came to denote “a person engaged in ‘futile and indiscriminate study’” (Chico, “Gimcrack’s Legacy,” 30).

²⁶ Thomas Shadwell, *The Virtuoso*, ed. Marjorie Hope Nicolson (1676; Lincoln: University of Nebraska Press, 1966), 2.2.1-84. References are to act, scene, and line numbers in this edition.

play (for example, Gimcrack's several disquisitions on transfusion) strongly echo passages from the Royal Society's journal, the *Philosophical Transactions*, and, in one case, Gimcrack's description of a mold growing on plums is taken wholesale from the *Micrographia*.²⁷ Hooke, who saw the play soon after it opened, was humiliated by the experience, and especially by the audience reaction that made him as much a part of the show's comedy as his caricature double, Gimcrack: "Damned Doggs. *Vindica me Deus*. People almost pointed," he wrote in his diary that evening.²⁸

Hooke's chagrin was well warranted, as one of the main targets of Shadwell's satire on the new science in *The Virtuoso* is the use of optical instruments. The passage taken from Hooke's *Micrographia*, for instance, is prefaced with a devastating parenthetical: "the blue upon plums, it is nothing but many living creatures," Gimcrack asserts,

I have observ'd upon a wall plum (with my most exquisite glasses, which cost me several thousands of pounds) at first beginning to turn blue, it comes first to fluidity, then to orbiculation, then fixation, so to angularization, then crystallization, from thence to germination or ebullition, then vegetation, then plantanimation, perfect animation, sensation, local motion, and the like. (4.3.221-228)

Gimcrack's aside frames the microscope as a consumer object, and its exquisite qualities as a locus primarily of conspicuous consumption; the possibilities of empirical revelation it enables come in a dubious second place. The inappropriateness of Gimcrack's investment in optical instruments is a running joke in the play, as when Gimcrack's niece

²⁷ See Nicolson's introduction and notes for more details on the play's intertexts.

²⁸ Robert Hooke, *The Diary of Robert Hooke, M.A., M.D., F.R.S., 1672-1680*, ed. Henry W. Robinson and Walter Adams (London: Taylor & Francis, 1935), 235 (2 June 1676).

Clarinda, in her first speech, describes her uncle as a “sot that has spent two thousand pounds in microscopes to find out the nature of eels in vinegar, mites in cheese, and the blue of plums which he has subtly found out to be living creatures” (1.2.7-10). As Clarinda’s account illustrates, Gimcrack’s outlay is farcical not only because of its extravagance, but also because this extravagance is wildly out of proportion with the subjects of his instrumental inquiry, which are both materially and intellectually minute. As Gimcrack’s colleague offers in a rather deflated encomium upon the virtuoso, there is “no man upon the face of the earth...so well seen in the nature of ants, flies, humble-bugs, earwigs, millipedes, hog’s lice, maggots, mites in a cheese, tadpoles, worms, newts, [and] spiders” (3.2.1-5). Gimcrack’s philosophical project is one of material trivialities, as the Lady Gimcrack confirms when she characterizes her husband’s laboratory as “a spacious room where all his instruments and fine knacks are” (2.1.289-290). Knackery, trinketry, toys: Gimcrack’s inquiry, focalized through one such trivial object, amounts to a collection of so many others. The knowledge that is his “ultimate end” is destined to join this array of useless curios. As he proudly asserts, “I seldom bring anything to use; ’tis not my way” (2.2.84-86).

Gimcrack was to be a lasting figure in critiques of the new science pursued across the Restoration and early eighteenth century. Joseph Addison even revived him in a series of essays in the *Tatler* in 1710. For Addison, Gimcrack exemplified natural philosophers’ inclination to attend only to “mean and disproportioned Objects,” and the related tendency of “Observations of this Kind” to “alienate us too much from the Knowledge of the World, and to make us serious upon Trifles.” Addison identifies this error as one of

perception, since “whatever appears trivial or obscene in the common Notions of the World, looks grave and philosophical in the Eye of a Virtuoso.” Gimcrack’s eyes—augmented by his array of expensive optical instruments—are organs that transmute “Refuse” into “Treasure.” Thus misapprehending objects that should act only as “diversions, relaxations, and amusements,” the virtuoso inappropriately makes them the “Care, Business, and Concern of Life.”²⁹

Addison’s essay, in its reprisal of Shadwell’s critique, shows how Gimcrack came to represent a mode of perception profoundly distorted through its affiliation with trifling objects. Apprehending the world through a trinketry lens, and rendering his empirically-adduced knowledge of it a series of mere knacks, Gimcrack’s folly is perhaps best encapsulated by his name, a word Johnson describes as connoting “[a] slight or trivial mechanism.” “Supposed, by *Skinner*,” Johnson writes, “to be ludicrously formed from *gin*, derived from *engine*,” a gimcrack is an inane diminutive, a technology of triviality.³⁰ In critiques of the new science such as those launched by Shadwell, Behn, and Addison, the designation “gimcrack” attaches to the natural philosopher’s optical instrument, in the sense of a “mechanical contrivance” or a “scientific apparatus,” but also in the sense of “a showy, unsubstantial thing...a useless ornament, a trumpery article, a knick-knack.”³¹ As these critiques make clear, however, the term gimcrack not only defines the mechanism

²⁹ Addison, “No. 216,” in *The Tatler. By Isaac Bickerstaff Esq.*, Vol. 1 (London: Addison and Steele, 1709-1711), 486, ECCO (CW3314815140).

³⁰ Johnson, *A dictionary of the English language: in which the words are deduced from their originals, and illustrated in their different significations by examples from the best writers*, Vol 1 (London: W. Strahan, 1756), s.v. “gimcrack,” ECCO (CB3331204754).

³¹ *Oxford English Dictionary Online*, s.v. “gimcrack, n. and adj.,” last modified March 2014, <http://www.oed.com/view/Entry/78334>.

of aggressive, material triviality embodied in devices like the microscope or telescope, but comes to signal to the broader technology of perception enabled by such mechanical contrivances. This technology of perception is one that has serious implications for both its subject and object.³² The gimcrack, linked with the body as artificial organ (or gaudy accessory), transmits its triviality to that body and to the subjectivity informed by the primary impressions it produces,³³ just as any articles refracted through the gimcrack's lens come to share its qualities.

The idea of the gimcrack I have just outlined is a useful interpretive tool to bring to bear on Behn's representation of optical technologies in *Emperor*. Baliardo himself is clearly a version of Shadwell's Gimcrack, sharing with him an obsession with the lunar realm (Gimcrack will "shortly publish a book of geography for [the moon]" as seen through his telescopes, and insists it is ruled by "a great monarch" [5.2.78-95]) and, of course, an investment in extravagant optical technologies. The links between the two plays extend, however, beyond these readily apparent similarities. By identifying Baliardo's array of instruments not simply as the trinkets they are explicitly named, but, more specifically, as the gimcracks their material qualities and epistemological effects demonstrate them to be, we can recognize how they participate in a debate about optical technology's mediatory functions that had wide-ranging implications for the status of

³² As Rivka Swenson has shown, our modern understanding of the gaze's "subject" and "object" do not quite work in the context of eighteenth-century theories of vision. Intromittist optical theories described the gaze's object as something that acted upon the eye and mind of the observer, rendering "the seeing subject" the "grammatical object of the seen person or thing" (31). See Swenson, "Optics, Gender, and the Eighteenth-Century Gaze: Looking at Eliza Haywood's *Anti-Pamela*," *The Eighteenth Century: Theory and Interpretation* 51, nos. 1-2 (2010): 27-43, doi: 10.1353/ecy.2010.0006.

³³ The *OED* definition of gimcrack lists alternate meanings of the word as an "affected showy person" or a "fanciful notion."

knowledge, the body, and the subject. Recognizing the gimcrack also allows us to see how the play is not just concerned with the politics of spectacle, as Al Coppola has argued,³⁴ but with the complex ways in which optical technologies operated upon subjects to produce particular *kinds* of visual experience and spectacular effects. Finally, as I will briefly outline below before moving to examine more closely the way Baliardo's instruments function in the play, the gimcrack has particular kinds of gendered significations that inform both Baliardo's character and the effects of Behn's satire more generally.

Frances Grose's *A Classical Dictionary of the Vulgar Tongue* includes an entry for gimcrack with two definitions, both of which attach themselves to particular bodies. One of these, "a person who has a turn for mechanical contrivances," is predictable, but the other, "a spruce wench," seems at first incongruous.³⁵ Yet, when we consider the gimcrack's suggestions of materiality, triviality, and unrestrained consumption, the word's association here with a woman's body—one that is spruced, "smart in appearance" and "apparel"³⁶—comes as no surprise. And, right around the time that Behn's *Emperor* premiered, female bodies were increasingly being spruced with optical instruments, as "glass-grinders found a new public among women for whom they manufactured exquisite microscopes which many ladies wore dangling from their

³⁴ See Coppola, "Retraining the Virtuoso's Gaze."

³⁵ Francis Grose, *A Classical Dictionary of the Vulgar Tongue* (London: S Hooper, 1785), 98-99, ECCO (CW3312687422).

³⁶ *Oxford English Dictionary Online*, s.v. "spruce, adj. and adv.," last modified September 2014, <http://www.oed.com/view/Entry/187868>.

bracelets.”³⁷ It was during the 1680s that the microscope began what was perceived as a “decline” from “a sizeable and relatively inaccessible tool of male-dominated science” to “the portable commodity popular with middle- and upper-class women that it had become by the early eighteenth century,” as Deborah Needleman Armintor, among others, has traced.³⁸ These “pocket microscopes,” available in “brass, silver, and ivory models” and “sold in elegant snuffbox-sized containers,” functioned as decorative accessories. Yet the instruments’ optical functions were not merely incidental: in fact, these small microscopes were able to transmit images to the eye “much more clearly at greater magnification” than the larger models used by Hooke and the Royal Society.³⁹ Regardless of their capacities, the miniature instruments were widely seen to literalize the qualities imputed to optical technologies by critics like Shadwell as they became ornamental toys in the hands (or on the wrists) of ladies. Hooke voiced his unease with the new developments in microscopy in his Cutlerian lecture of 1691-92, crediting the microscope’s new incarnation as “a portable Instrument...easy to be carried in one’s Pocket” with its “Neglect and Slighting” as a technology of knowledge production, such that he now knows of “none that make any other Use of that Instrument, but for Diversion and Pastime,” save the estimable Leeuwenhoek (and, presumably, himself).⁴⁰ While

³⁷ Marjorie Hope Nicholson, introduction to *The Virtuoso*, by Thomas Shadwell (1676; Lincoln: University of Nebraska Press, 1966), xx.

³⁸ Deborah Needleman Armintor, “The Sexual Politics of Microscopy in Brobdingnag,” *SEL* 47, no. 3 (2007): 620, <http://www.jstor.org/stable/4625129>. Needleman Armintor draws on Marian Fournier’s *The Fabric of Life: Microscopy in the Seventeenth Century* (Baltimore: Johns Hopkins University Press, 1996) and Catherine Wilson’s *The Invisible World: Early Modern Philosophy and the Invention of the Microscope* (Princeton: Princeton University Press, 1997) for her argument about gender and microscopy.

³⁹ Needleman Armintor, 623.

⁴⁰ Robert Hooke, “Dr. HOOKE’s Discourse concerning *Telescopes* and *Microscopes*; with a short Account of their Inventors, read in *February 1691-2*,” in *Philosophical Experiments and Observations*, ed. W. Derham

Hooke sidesteps the issue of female microscopists here, it remains implicit in his argument about how the instrument's miniaturization has resulted in its use by unserious people in inappropriate ways. The microscope's perceived feminization was explicitly invoked, however, in other texts. Needleman Armintor, who looks back on the microscope's trivialization from the perspective of Jonathan Swift's *Gulliver's Travels* (1726), identifies Gulliver's own diminishment in Brobdingnag as a satire of microscopy and its modest witness, who is unwittingly "overcome and...objectified by the emasculating and feminine consumer culture in which he and his instrument have become helplessly immersed."⁴¹ In Swift's formulation, the scientific instrument's feminized triviality is a quality ultimately transmitted to the body of its male operator.

As the example of the pocket microscope demonstrates, whether it spruced a female body, decorated a natural philosopher's laboratory, or dangled from a virtuoso's girdle, the gimcrack was a mechanism intimately linked with early modern constructions of gender. The aggressively material triviality the gimcrack both represented and produced was linked with the ornamented female body and the feminized realm of fashionable consumer objects. And, as gimcracks, Baliardo's philosophical trinkets are technologies that ultimately enact the virtuoso's emasculation: even, and indeed especially, that enormous, exaggeratedly phallic telescope.

(London: Frank Cass & Co, 1967), 261. Hooke does not mention that Leeuwenhoek's original microscopes were themselves extremely small.

⁴¹ Needleman Armintor, 630.

Scenes of Discovery

My analysis thus far has concentrated on the ways Baliardo's instruments signify as they accompany the doctor into the playing space. Before long, of course, these instruments are put to use, and so initiate the metatheatrical farce that is continued (and continually elaborated) through the remainder of the play. Soon after Baliardo and his telescope take the stage, Charmante joins them, arrayed in "*a strange fantastical habit*" and assuming the character of a Rosicrucian cabalist sent to induct Baliardo into their society, and to inform him of the moon-emperor's interest in a human woman (later revealed to be Elaria). Charmante promises the doctor that if he can demonstrate his "absolute abstinence from carnal thought," he will be welcomed into the cabal (1.2.62). In order to try Baliardo's purity, a test is arranged—if the doctor is indeed "thoroughly purged from vice," Charmante explains, the "optics of [his] sight will be so illuminated" that he will be able to perceive Rosicrucian spirits ("those lovely creatures, that people that vast region of the air") through his telescope (1.2.71-74).⁴² As the stage direction describes:

[Doctor Baliardo] looks in the telescope. While he is looking, Charmante goes to the door to Scaramouch, who waited on purpose without, and takes a glass with a picture of a nymph on it, and a light behind it, that as he brings it, it shows to the audience. Charmante goes to the end of the telescope.

Charmante asks Baliardo, "Can you discern, sir?," to which Baliardo responds, "Methinks I see a kind of glorious cloud drawn up—and now—tis gone again."

⁴² Just as Charmante's "society" lampoons actual Rosicrucian doctrines while simultaneously casting a "satirical glance at the Royal Society" (Spencer, 283 n28), the purity test invokes Rosicrucian beliefs while implicating key Society figures like Robert Boyle, who was well-known to have taken a vow of chastity under similar Neoplatonic auspices.

Charmante suggests that, since the doctor as yet sees no figure, he should make “a short prayer to Alikin...shake off all earthly thoughts, and look again.” While the doctor is distracted by his prayer, “*Charmante puts the glass into the mouth of the telescope,*” and when Baliardo looks again, “Astonished, ravished with delight,” he sees “a beauty young and angel-like, leaning upon a cloud” (1.2.78-86). Charmante continues the deception, egging the doctor on:

CHARMANTE: Seems she on a bed? Then she’s reposing, and you must not gaze.

DOCTOR: Now a cloud veils her from me.

CHARMANTE: She saw you peeping then, and drew the curtain of the air between.
(1.2.87-91)

Charmante’s trick here is, most obviously, an entertaining set piece through which the audience is invited into the trickster-hero’s omniscient, satirical perspective of Baliardo’s telescopic misapprehensions.⁴³ At the same time, however, the scene offers a sophisticated comment on the ways that stage and scientific technologies act upon the sight, ultimately suggesting that these processes are analogous.

Charmante’s optical gambit here is one that involves particular actions and effects: namely, the sudden appearance of a new vista and the equally sudden “drawing” of this vision from view. These actions and effects replicate those of another optical maneuver, one enabled by the new scenic technologies of the Restoration’s public stages: the discovery scene. Discovery scenes were a representational strategy that used mobile scenery to generate striking visual revelations of concealed stage spaces, and were one of the most recognizable and commonly used effects associated with the new changeable

⁴³ The trick continues with a second glass plate depicting the lovelorn emperor, setting Baliardo up to believe in the lunar monarch’s supposed interest in Elaria.

scenery. This scenery was constructed from painted flats (typically made from canvas stretched over a wooden frame) and set in a series of staggered grooves running the length of the stage.⁴⁴ What we might call a single set (but Restoration authors and audiences referred to as a “scene”) was normally composed of two of these flats, each extending from the wings to meet in the middle of the stage and thus, together, forming a complete visual representation of one space.⁴⁵ At cues indicated by the stage directions, these lightweight flats could be drawn apart to “discover” a further playing space behind them, which was itself usually backed by another set of scenic flats set in grooves further upstage.⁴⁶ Flats could likewise be drawn together to conceal scenes and actors behind them. As a number of critics have shown us, scene changes on the Restoration stage were treated quite differently than our present-day understanding of stage conventions would suggest. Richard Southern begins his book on changeable scenery by emphasizing that “the changing of scenes was intended to be visible; it was part of the show; it came into existence purely to be watched.”⁴⁷ As a “*playing thing*” this “dynamic scenery” functioned not as a backdrop, but as an “operative factor” in the drama, with scene

⁴⁴ Frans and Julie Muller, “Completing the Picture: The Importance of Reconstructing Early Opera,” *Early Music* 33, no. 4 (2005): 677, <http://www.jstor.org/stable/3519588>.

⁴⁵ The flats were often accompanied by a series of additional, decorative scenic shutters extending from the wings downstage of the flats to add visual interest and create an illusion of spatial depth. Jocelyn Powell explains in *Restoration Theatre Production* (London: Routledge and Kegan Paul, 1984) that the “combination of the painted scene with its wings and shutters giving the illusion of depth, and the relieve scene giving further depth behind, became basic to the scenic design of the Restoration, and the interaction of deep with comparatively shallow scenic effects gave the plays much of their rhythmic impulse” (41).

⁴⁶ For information on the construction and use of Restoration scenery, Richard Southern’s 1951 monograph *Changeable Scenery: Its Origin and Development in the British Theatre* (London: Faber and Faber, 1951) remains an invaluable source. I have also drawn on the more recent work of Frans and Julie Muller, Jocelyn Powell, and Peter Holland’s *The Ornament of Action: Text and Performance in Restoration Comedy* (Cambridge: Cambridge University Press, 1979).

⁴⁷ Southern, 17

changes happening in full view of the audience, and often with characters still onstage.⁴⁸

The popularity of the discovery scene in Restoration drama was a function both of this spectacular scenic mobility, and of the pleasure audiences took in viewing its rapid transformations of the stage space: transformations which allowed them to be “‘transported’ from one place to another without leaving their seats.”⁴⁹ It is precisely this mode of visual revelation—“[t]he movement of painted flats, the discoveries of previously unseen interiors”—that Elin Diamond credits with introducing a “new scopic epistemology” for its Restoration spectators.⁵⁰ While the visual experience of scenic discovery was indeed new to the public, commercial stages of Restoration London, the scenic technologies that enabled these discoveries had been regularly used in the English court theatre since the early seventeenth century, as I will discuss in greater detail below.

That Charmante’s optical trick stages a discovery scene for Baliardo is evident not only from the kind of visual effect it produces—the “Astonish[ing]” revelation of a previously unseen space (1.2.85)—but also from the language both trickster and dupe use to describe the maneuver. Conjugations of the verb “to draw” are used twice in this short vignette (once by Baliardo, once by Charmante) to explain what the doctor sees through his telescope, thus characterizing his visual experience with a term universally used in the context of the Restoration stage to describe the action of scenic movement, and repeated in countless stage directions indicating where “the scene draws.” The content of the tableau revealed to Baliardo links this telescopic spectacle even more strongly with the

⁴⁸ Southern, 142, 139.

⁴⁹ Frans and Julie Muller, “Completing the Picture,” 677.

⁵⁰ Diamond, 521.

tradition of stage discoveries. The play of concealment and exposure inherent to the discovery scene often had an erotic dimension, and the disclosure of a sexualized female body in a private space was a common stage discovery. To give only a few examples, in Thomas Otway's *Alcibiades*, a discovery opens on the heroine Timandra "asleep on a couch";⁵¹ in Nicholas Rowe's *Tamerlane* Arpasia is likewise revealed "lying on a couch";⁵² William Taverner's *The Artful Husband* discovers Lady Upstart "at a Toylet dressing,"⁵³ and, four scenes later in *The Emperor of the Moon*, the "scene draws off [to show Bellamente's chamber, and] discovers Elaria, Bellamente, and Mopsophil in night-gowns" (2.4.1). This kind of disclosure simultaneously drew on the visual appeal of the mobile scenery and of the actresses who were a similarly recent presence on the public stage. That Baliardo's nymph is found "reposing" on a bed of clouds (a scene on which the doctor briefly "peep[s],"⁵⁴ though Charmante warns him that "he must not gaze") is a detail that plays on this convention, and one that is particularly significant within the context of Behn's dramatic oeuvre.

Behn's creative and innovative use of stage space and scenic effects in her plays has been noted by critics like Derek Hughes, who observes that from the very beginning of her dramatic career Behn "had a remarkable gift for exploiting the visual resources of the stage," a facility that sets her work noticeably apart from other playwrights writing at

⁵¹ Quoted in Holland, *Ornament of Action*, 38.

⁵² Nicholas Rowe, *Tamerlane*, in *The Dramatick Works of Nicholas Rowe, Esq* (London: T. Jauncy, 1720), 1:54, ECCO (CW111615537).

⁵³ William Taverner, *The Artful Husband. A Comedy* (London: Elizabeth Sawbridge, 1718), 20, ECCO (CW110086495).

⁵⁴ Benedict argues that during the Restoration the term "peep" signified not just an illicit look but also a particular kind of "unauthorized empiricism" aligned with "the lust of the eyes" (142-43), a meaning Behn clearly plays on here.

the same time.⁵⁵ Hughes argues that Behn used these scenic resources not only to make her dramatic work visually engaging, but also, more particularly, to “examine the different ways in which men and women control space.”⁵⁶ Behn’s use of discovery scenes exemplifies her critical engagement with Restoration stage technologies and the scenic effects they produced. In his work on performance and theatrical representation in the Restoration, Peter Holland describes Behn’s deployment of discovery scenes as “positively obsessive,” and “an exception to the rule” of contemporaneous works “so pronounced as to necessitate consideration.” Holland notes that in her ten comedies alone (not including the farces, such as *Emperor*) “there are no fewer than thirty-one discoveries, many of them needing much of the scene to be acted upstage.”⁵⁷ Holland suggests that these disclosures cater to a scopophilic gaze, centering as they repeatedly do on women caught in “scenes of undressing, dressing or bedrooms,”⁵⁸ while Hughes argues that Behn’s discoveries “emphasize a juxtaposition between different kinds of space” within a gendered spatial field.⁵⁹ Susan Green agrees that the effects of discovery in Behn’s work have to do with gender but sees these scenes of disclosure functioning differently, in a way that is “crucially tied...to issues about the representability of the female body.” Linking the discovery’s effect to the disruptive presence of the Restoration actress onstage, she contends that the scenic maneuver “occurs over and over again because the female body, signified by the female actresses themselves, is always, and

⁵⁵ Derek Hughes, “Aphra Behn and the Restoration Theatre,” in *The Cambridge Companion to Aphra Behn*, ed. Derek Hughes (Cambridge: Cambridge University Press, 2012), e-book.

⁵⁶ Hughes, “Restoration Theatre.”

⁵⁷ Holland, *Ornament of Action*, 41.

⁵⁸ Holland, *Ornament of Action*, 41

⁵⁹ Hughes, “Restoration Theatre.”

perhaps awkwardly, present to her audience.”⁶⁰ What these scholars make clear, even through their differing arguments, is that for Behn scenic effects in general, and the discovery scene in particular, were a key part of her works’ interrogations of interlinked structures of gender, space, spectatorship, desire, and power, and that this field of concerns is a context within which Baliardo’s telescopic discovery must be read.

Through this telescopic discovery, the staged female body enters the scene of empirical philosophical investigation as a disruptive presence, calling attention to the limits of the knowledge produced by the virtuoso and his instrument, and its damning affiliation with fantasy, illusion, spectacle, and entertainment. With the trick, Behn thus mounts a kind of dual discovery, one in which Baliardo’s delectation of the nymph exposes his artificial vision’s failure to distinguish artifice from empirical truth. Indeed “disclosing a character on the edge of a new space and state,”⁶¹ the discovery reveals that the new territories visible through Baliardo’s instruments are as easily interchangeable with sham fantasies as the doctor’s intellectual engagement is with sexual excitement. In this way, the trick does more than lampoon the virtuoso’s pretensions to chaste rationality and his “prurient curiosity veiled as disinterest.”⁶² By proposing that the boundary between philosophical observation and spectacular illusion is muddy at best, Baliardo’s telescopic revelation ultimately suggests an inherent equivalency between stage and scientific discoveries.

⁶⁰ Susan Green, “Semiotic Modalities of the Female Body in Aphra Behn’s *The Dutch Lover*,” in *Rereading Aphra Behn: History, Theory, and Criticism*, ed. Heidi Hutner (Charlottesville: University Press of Virginia, 1993), 138.

⁶¹ Hughes, “Restoration Theatre.”

⁶² Benedict, 62.

Behn was not the only one who noticed a resemblance between these two kinds of technologically mediated revelations. Prominent members of the Royal Society had themselves been expressing concerns about the likeness of their experiments to popular entertainments for years. A letter written from Christopher Wren to William Brouncker (then the Society's president) in 1664 and subsequently published in the Society's proceedings is illustrative. The letter was written amidst the Society's preparations for a visit from the king (a visit considered particularly important because, at that time, the Society still hoped to gain an endowment from the crown).⁶³ Wren, attempting to decide on an appropriate demonstration of the Society's methods for the monarch, writes:

What...to suggest to your lordship I cannot guess. The solemnity of the occasion, and my solicitude for the honour of the society, make me think nothing proper, nothing remarkable enough...if you have any notable experiment, that may appear to open new light into the principles of philosophy, nothing would better beseem the pretensions of the society; though possibly such would be too jejune for the purpose, in which there ought to be something of pomp. On the other side, to produce knacks only, and things to raise wonder, such as KIRCHER, SCHOTTUS, and even jugglers abound with, will scarce become the gravity of the occasion. It must therefore be something between both, luciferous in philosophy, and yet whose use and advantage is obvious without a lecture; and besides, that may surprise with some unexpected effect, and be [commendable] for the ingenuity of the contrivance. Half a dozen of experiments thus qualified will be abundantly enough for an hour's entertainment and I cannot believe the society can want them, if they look back into their own store.⁶⁴

In order to honour the Society and impress the king, Wren recognizes that the presentation of experiments must be spectacular. At the same time, too close an affiliation

⁶³ See Michael Hunter, *The Royal Society and its Fellows 1660-1700: The Morphology of an Early Scientific Institution* (London: BSHS, 1994), 15-16 for more information on the financial situation of the Society during its first years.

⁶⁴ Thomas Birch, *The history of the Royal Society of London for improving of natural knowledge, from its first rise. In which the most considerable of those Papers communicated to the Society, which have hitherto not been published, are inserted in their proper order, as a Supplement to the Philosophical Transactions*, (London: A. Millar, 1756-57), 1:288, ECCO (CW3303765227).

with spectacle easily renders an experiment a mere knack (or gimcrack), unserious and intellectually vacant, and ultimately fit only to raise wonder. Wren's criticism of Athanasius Kircher (and his follower, Kaspar Schott) is particularly interesting in this regard, as Kircher—a seventeenth-century German Jesuit philosopher—had a fascination with mechanical inventions and optical instruments that in many ways mirrored that of the Royal Society fellows.⁶⁵ Kircher was particularly known for his writings on the magic lantern, a proto-cinematic technology that projected “various images, and spectres on a wall, or other white surface, so odd and surprising, that those who are not in the secret, think them the effect of magic.”⁶⁶ Developed at the same time as other optical technologies like the microscope and telescope and utilizing the same principles, the magic lantern was not nearly far enough removed from these more philosophically inclined instruments for the Society's comfort. Ephraim Chambers demonstrates the easy slippage between dazzling spectres and philosophical observations as he explains that if “[l]ittle animals” are “included in the *Magic Lantern*, in the manner observed in speaking

⁶⁵ See John Fletcher, *A Study of the Life and Works of Athanasius Kircher, 'Germanus Incredibilis', with a Selection of his Unpublished Correspondence and an Annotated Translation of his Autobiography*, ed. Elizabeth Fletcher (Leiden: Koninklijke Brill, 2011).

⁶⁶ Ephraim Chambers, *Cyclopædia: or, an universal dictionary of arts and sciences*, 4th edn (London: D. Midwinter et al, 1741), 2:8, ECCO (CW106304119). See also Marina Warner, *Phantasmagoria: Spirit Visions, Metaphor, and Media* (Oxford: Oxford University Press, 2008), 137-143, for a critical account of Kircher's magic lantern.

of the microscope” or if “any little transparent objects fastened to a slice of talk or glass” are “substituted” for the “little painted images” typically placed in the lantern, “the *Magic Lantern* will become a microscope.”⁶⁷ Wren, who clearly has the magic lantern in mind as he writes his letter, struggles with the challenge of mounting an experimental program that will “open new light into the principles of philosophy” for its observers without

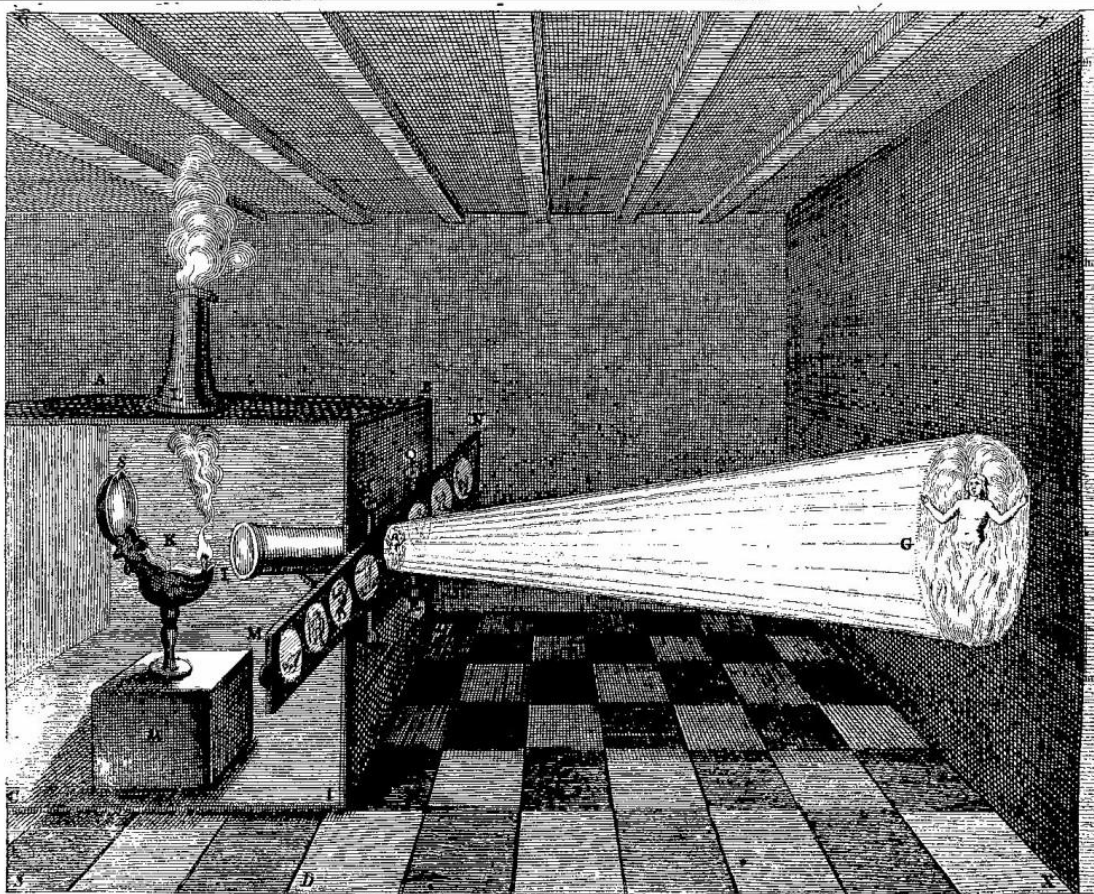


Figure 1: Kircher's Magic Lantern, from Giorgio de Sepibus, *Romani Collegii Musaeum Celeberrimum*, via <http://www.stanford.edu/group/kircher/>

⁶⁷ Chambers, 63. We might also recall the ease with which Baliardo's telescope, fixed with a little painted image, is converted into a kind of magic lantern. The illustration of Kircher's lantern in fig. 1, which shows a series of painted glasses able to be quickly shifted in order to produce a new projected image, suggests an affinity between magic lantern shows and stage effects like the discovery scene.

turning the Society's works into an empty series of sensational entertainments (or, more dangerously, suggesting that that is what they already are).

The compromise Wren lands on, a demonstration that is "luciferous in philosophy" but that, designed for an effect "obvious without a lecture," appeals only to the eyes, does not seem as different from knacks and jugglers as he might hope. In fact, this imagined philosophical spectacle, planned to "surprise with some unexpected effect, and be [commendable] for the ingenuity of the contrivance," precisely replicates the optical and epistemological functions of the public stage's new scenic technologies. In his work on the microscope (written in the same year as Wren's letter) Power argues that scientific technologies, in their mediatory function, *remove* natural philosophy from the threat of becoming merely an elaborately staged fantasy. "[W]ithout some such Mechanical assistance," Power contends,

our best Philosophers will but prove empty Conjecturalists, and their profoundest Speculations herein, but gloss'd outside Fallacies; like our Stage-scenes, or Perspectives, that show things inwards, when they are but superficial paintings.⁶⁸

In Wren's formulation, however, the scene of technologically mediated philosophical discovery is the unmistakable double of the staged discovery scene, no matter how vigorously he, or other Society fellows, might deny a resemblance between the two.⁶⁹

That, as Wren writes, the Society has many previously performed experiments quite suitable for this "hour's entertainment" suggests that it is not simply the occasion of the

⁶⁸ Power, 18.

⁶⁹ An apocryphal detail too intriguing not to reference here is that Wren himself is popularly believed to have been the architect of Dorset Garden Theatre. Diana De Marly, revisiting the evidence, has suggested a more likely candidate: Robert Hooke. See De Marly, "The Architect of Dorset Garden Theatre," *Theatre Notebook* 29 (1975): 119-24.

royal visit that calls forth this similarity. Robert Hooke, who was often requested to present experimental “shows” for Society members (and chastised if the shows failed),⁷⁰ complained that many of the fellows themselves came to Society meetings “only as to a Play to amuse themselves for an hour or so.”⁷¹ It is not known if Wren’s planned experimental demonstration for the king actually took place, or, if it did, what experiments were demonstrated; in any case, the Society failed to secure an endowment from Charles, but not to entertain him. In February of 1664 Samuel Pepys recounts hearing the king laugh “mightily” for “an hour or two...at Gresham College” for “spending time only in weighing of ayre, and doing nothing else since they sat.”⁷² By 1668 Charles was calling Society members his “fous,” or jesters.⁷³

Another demonstration presented by the Society to a prominent visitor offers us further opportunities to explore the links between the Society’s experimental program and the staged spectacle it both mirrored and rejected. A few years after Wren’s letter, Margaret Cavendish, joining the fellows on May 30, 1667, became the first woman to attend a Society meeting. Cavendish was, of course, a natural philosopher herself, having by the time of her visit already published *Philosophical and Physical Opinions* (1655),

⁷⁰ Shapin, “House of Experiment,” 401-02.

⁷¹ Quoted in Hunter, 13. Hunter concurs that “the Society seems to visualized science very much as a performing art in its early years, deliberately seeking to have experiments demonstrated by paid employees like Hooke” and that “there can be no doubt that on occasion the Society devoted an unnecessary amount of time to scientifically unproductive experiments and discussions of subjects of wide popular interest” (21). For more on the perceived links between scientific and stage spectacle in the Restoration, see John Shanahan, “Theatrical Space and Scientific Space in Thomas Shadwell’s *Virtuoso*,” *SEL* 49, no. 3 (2009): 549-571, <http://www.jstor.org/stable/40467312>.

⁷² Samuel Pepys, *The Diary of Samuel Pepys: A Selection*, ed. Robert Latham (London: Penguin, 2003) 346-47.

⁷³ Quoted in Lisa Sarasohn, *The Natural Philosophy of Margaret Cavendish* (Baltimore: Johns Hopkins University Press, 2010), 33.

the *Philosophical Letters* (1664), and *Observations upon Experimental Philosophy* (1666). Cavendish's natural philosophy was, however, in direct and near-total opposition to the Royal Society's technologically-mediated experimentalism.⁷⁴ In her *Observations*, Cavendish writes back to the *Micrographia* (without dignifying it by mention of its name), condemning optical technologies and the observations they enable as trivial, useless, and ultimately fallacious. "[I]f Microscopes do truly represent the exterior parts and superficies of some minute Creatures, what advantages it our knowledge?" she asks, continuing:

For unless they could discover their interior, corporeal, figurative motions, and the obscure actions of Nature, or the causes which make such or such Creatures, I see no great benefit or advantage they yield to man: Or if they discover how reflected light makes loose and superficial Colours, such as no sooner perceived, but are again dissolved; what benefit is that to man?...The inspection of a Bee, through a Microscope, will bring him no more Honey...The truth is, most of these Arts are Fallacies, rather than discoveries of Truth; for Sense deludes more than it gives a true Information, and an exterior inspection through an Optick glass, is so deceiving, that it cannot be relied upon.⁷⁵

Cavendish ultimately characterized Society fellows as children amusing themselves with "pretty toys to imploy idle time,"⁷⁶ writing that,

as Boys that play with watry Bubbles (Glass tubes) or fling Dust (Atomes) into each others Eyes, or make a Hobby-horse (exterior figures) of Snow, are worthy of reproof rather than praise; so [too are] those that addict themselves to unprofitable Arts.⁷⁷

⁷⁴ A full engagement with Cavendish's natural philosophy is unfortunately beyond the scope of this chapter; for a detailed account of her work, see Sarasohn's monograph.

⁷⁵ Margaret Cavendish, *Observations upon Experimental Philosophy, to which is added the description of a new blazing world* (London: A Maxwell, 1666), x-xi, EEBO.

⁷⁶ Cavendish, 101.

⁷⁷ Cavendish, 43.

In the context of her thoroughgoing critiques of the Society's methods and materials, Cavendish's appearance at a Society meeting was a complex act. Lisa Sarasohn, in her recent study of Cavendish's natural philosophy, has reread the duchess's visit to the Royal Society as a performative continuation of her textual criticism of the Society. The Society fellows, who were conflicted about admitting Cavendish at all,⁷⁸ finally resolved on May 23, 1667 to allow her to attend and "be entertained with some experiments" at the next meeting, and set about planning a suitable series of demonstrations, including displays by Boyle and Hooke of the functions of the air-pump and "a good microscope."⁷⁹ Cavendish was, at the same time, devising her own kind of show. Her appearance at the meeting was sensation in every respect. As the fellows waited at length for Cavendish to appear, a crowd gathered to see the duchess, who was infamous for her striking, idiosyncratic self-presentation; earlier the same year, Pepys recounts attending Whitehall in the hopes of getting a glimpse of her, remarking that

[t]he whole story of this lady is a romance, and all she doth is romantic. Her footmen in velvet coats, and herself in antique dress, as they say... There is as much expectation of her coming to Court, that so many people may come to see her, as if it were the Queen of Sweden.⁸⁰

When Cavendish finally arrived at the meeting, it was with "great pomp,"⁸¹ attended by a retinue of ladies and appearing herself with a "dress so antic" and a "deportment so unordinary" that it unsettled Pepys, who "[did] not like her at all."⁸² As Sarasohn

⁷⁸ Pepys writes that Cavendish was allowed to attend "after much debate pro and con, it seems many being against it" (780).

⁷⁹ Thomas Birch, *The history of the Royal Society of London for improving of natural knowledge* (London: A. Millar, 1756-57), 2:175-77, ECCO (CW3303765455).

⁸⁰ Pepys, 754.

⁸¹ John Evelyn, quoted in Sarasohn, 30.

⁸² Pepys, 780-81.

recognizes, through this carefully staged appearance the duchess “turned the meeting of the Royal Society into a carnival, with the exhibit being not the sober experiments with which she was entertained but herself at her most fantastic.”⁸³ The status of these sober experiments was likewise to be unsettled by Cavendish’s presence. The duchess’s only reaction to the demonstration, at least that Pepys records, is her statement that she is “full of admiration, all admiration,” a response that has been taken by dismissive commentators to express Cavendish’s “childlike love of the natural world.”⁸⁴ Sarasohn points out that admiration, signifying as it did in the seventeenth century a neutral wonder as well as appreciation, was a considerably more ambivalent sentiment, especially in relation to the material Cavendish was witnessing. Royal Society fellows had expressed discomfort with admiration as a reaction to their work, with Boyle writing that admiration usually stemmed from the display of showy “trifles,” and that “tis fitter for Mountebancks than Naturalis to desire to have their discoveries rather admir’d than understood.”⁸⁵ As a philosophically astute observer reacting to the Society’s demonstration with admiration only, Cavendish categorized the experimental presentation as a series of amusing trivialities, due no more or less consideration than any mountebank’s spiel. While Cavendish’s reaction implicitly demeaned the Society’s work as empty spectacle, Sarasohn notes that the duchess’s own personal display

⁸³ Sarasohn, 30-31. Sawday writes that Cavendish was perceived during the visit as “an ornament, a decorative embellishment to the serious matter of reflection put in hand by the early Royal Society.” See *The Body Emblazoned: Dissection and the Human Body in Renaissance Culture* (New York: Routledge, 1995), 250.

⁸⁴ Samuel I. Mintz, “The Duchess of Newcastle’s Visit to the Royal Society,” *Journal of English and Germanic Philology* 51, no. 2 (1952): 176, <http://www.jstor.org/stable/27713402>.

⁸⁵ Quoted in Sarasohn 31-32.

simultaneously “suggested that she herself was more worthy of admiration and wonder than anything the society could produce.”⁸⁶

Cavendish’s visit to the Royal Society can be read as a kind of companion piece to the telescope trick Behn would mount at Dorset Garden two decades later. In Cavendish’s performative satire of the Society, the disruptive appearance of a staged female body in the scene of philosophical discovery exposes that scene and its modest witness as participants an illusory (if amusing) kind of spectacular entertainment. Like the discovery of the nymph through Baliardo’s telescope, the duchess’s visit acts to demarcate the limits of the natural philosopher’s technologically-mediated vision; much like Baliardo, however, the Royal Society fellows remain unaware of exactly what kind of performance they are giving. By dismissing the Society’s experimental entertainments as a series of gimcracks while simultaneously performing her own control (as a noble and notably Royalist woman) over an ornamental and extravagant mode of personal display, Cavendish alerts us to how these questions of discovery, knowledge, embodiment, and material display are implicated in a larger shift between different modes of subjectivity. Will Pritchard, drawing on Cynthia Lowenthal’s work, notes that critical accounts of the Restoration self depict it as “exterior and outward,” but with “a sense of anxiety attendant upon that externalized self, a lingering unease with the knowledge that human surfaces are ‘provisional, liable to manipulation, and subject to self-conscious and self-generated transformation.’”⁸⁷ This anxiety was one increasingly “displaced and projected onto

⁸⁶ Sarasohn, 32

⁸⁷ Will Pritchard, *Outward Appearances: The Female Exterior in Restoration London* (Lewisburg: Bucknell University Press, 2008), 27.

women,” in an effort to “cast women as ‘the only counterfeits’ and to position men as the possessors of stable selves capable of penetrating women’s disguises”: a penetration to be accomplished through the same kind of empirical optical strategies used by the Royal Society.⁸⁸ Cavendish draws on a long tradition of aristocratic self-performance in her visit to the Society, treating her visit there as an extension of her spectacular appearances in court spaces such as Whitehall. In doing so, she implicitly contrasts herself, and the mode of personal and political power her theatrical appearance represents, with the Society men whose philosophical project claimed to see through such superficialities with their collection of knacks. As a context for Behn’s mockery of Baliardo, Cavendish’s appearance at the Society illuminates the broader cultural stakes of *Emperor’s* satire. Caught by a trick in which he is seduced by a painted, literally superficial female body—associated through its discovery with the painted body of the actress and which, despite its actual transparency, he cannot see through—Baliardo is utterly taken in by the kind of feminized spectacle his technologically mediated vision is meant to penetrate. Moreover, the trick emphasises the way these optical technologies, as gimcracks, reflect only illusory trivialities back to those who rely on them to repair their vision, producing a subject informed by fantasy rather than sober empirical witnessing. Behn, displaying her own mastery of spectacle through the complex staging of the telescope trick, lampoons the virtuoso who utterly fails to master the scene of discovery, or to perceive that he is the one it exposes. Like Cavendish’s visit, Behn’s demonstrative entertainment engages with material spectacle in a complex way. The doctor is not laughable here simply because he

⁸⁸ Pritchard, 27.

overinvests in trinketry, but because his gimcrack optics claim a rational transparency that the instruments' material qualities and effects belie. By immersing the kind of masculinist, technological empiricism Baliardo represents in a scene of spectacular stagecraft, Behn reveals how they already mirror each other, while affirming the power of the feminized, material spectacle the virtuosos purported to reject.

Most grateful deceptions of the sight

After a series of escalating tricks, *Emperor's* final scene brings about their culmination with the performance of an extravagant show for Baliardo (and the Dorset Garden audience), one that stretches the theatre's scenic capabilities to their full extent. This show is, as Scaramouch explained in the first scene of the play, a "farce" called "*The World in the Moon*," through which Baliardo "shall be so imposed upon, as shall bring matters magnificently about" (1.1.107-09). Scaramouch, Harlequin, and the two lovelorn Dons have converted an abandoned gallery on Baliardo's estate into a makeshift theatre and, hustling the doctor there, promise him that now, "with the help of your telescope, you may discover all" (3.2.397-98). Entering the space now "*richly adorned, with scenes and lights*," Baliardo's reaction is telling. Bellamente and Elaria, in on the trick, feign astonishment while the doctor flounders in an aside, muttering "I'm all amazement too, but must not show my ignorance" (3.3.4). Elaria goads him on, insisting that "Sure, sir, 'tis some enchantment," at which Baliardo bristles:

Let not thy female ignorance profane the highest mysteries of natural philosophy. To fools it seems enchantment, but I've a sense can reach it: sit, and expect the event. Hark! [*Aside*] I am amazed, but must conceal my wonder, that joy of fools, and appear wise in gravity. (3.3.10-14)

Before the show even begins, this exchange recapitulates the play's critique of Baliardo's immodest witnessing. The contrast the doctor attempts to make between a credulous, feminized ignorance and his own masculine sober sense collapses before it is even articulated, made ridiculous by Baliardo's own immoderate wonder. Implicated in the failure of the doctor's sense is the optical instrument meant to repair it. As Baliardo defends his superior rational capacities he is likely clutching the telescope Scaramouch reminded him to bring along, becoming as he does the punchline of a visual joke about the ease with which his perception has been deluded by the technology that supposedly allows it to reach natural philosophy's highest mysteries. Baliardo's telescope does not enable him to discern the falsity of the spectacle any more than his eyes do, and instead the instrument becomes a prop in the scene of the virtuoso's most fantastic misapprehensions.

Within a few lines of Baliardo's dismissal of Elaria, the first of the scene's two discoveries is put in motion, and the play opens with it into an ostentatious, exoticized scenic fantasy. The stage directions indicate that

The scene in the front draws off and shows the hills of Parnassus; a noble large walk of trees leading to it, with eight or ten negroes upon pedestals, ranged on each side of the walks. Next Kepler and Galileus descend on each side, opposite to each other, in chariots, with perspectives [i.e. telescopes] in their hands, as viewing the machine of the zodiac. Soft music plays still. (3.3.5)

The ersatz Kepler and Galileo introduce themselves to Baliardo as interpreters for the moon-emperor Iredonozar and the Prince of Thunderland, and the spectacle continues as a large scenic machine in the form of a zodiac descends upon the stage. Twelve actors representing the signs of the zodiac disembark from the machine to sing a song and

dance, after which Kepler marks for Baliardo that the moon itself is now “descend[ing] two thousand leagues below its wonted station” (3.3.107-08) to bring the emperor to attend upon them. Another machine representing “*the globe of the moon*” is lowered from above the stage, appearing “*first, like a new moon*”; then,

as it moves forward it increases, till it comes to the full. When it is descended, it opens, and shows the emperor and the prince. They come forth with all their train, the flutes playing a symphony before [the emperor], which prepares the song; which ended, the dancers mingle as before.

Following this song and dance, the two lunar monarchs indicate their passion for Elaria and Bellamente through pantomime. After another dance, the scene’s second discovery takes place as “*the front scene draws off, and shows a temple, with an altar, one speaking from a stentraphon [speaking tube] behind it,*” from which issues the monarchs’ declaration of their wish to marry the two women, a request Baliardo, “*kneel[ing] in transport,*” grants (3.3.141-167). The real marriage of Cinthio and Charmante to Elaria and Bellamente then takes place as part of the spectacle before the illusion is finally, deliberately, shattered by the incursion of Harlequin and Scaramouch, and Baliardo’s reform is accomplished.

I have offered an extended summary of the play’s final scene in order to give a sense of the elaborate, continually escalating scenic effects deployed in this culminating entertainment. The lavish staging of this scene makes *Emperor* one of the most sensational of a series of similarly elaborate plays it joined on the Dorset Garden stage. *Emperor* has an intimate relationship with these other dramatic entertainments (variously labeled semi-operas, machine operas, and multimedia or Dorset Garden spectaculars),

which Behn would have known very well, if only out of necessity.⁸⁹ Coppola points out that, for financial reasons, the scenes and machines used in *Emperor* would likely have been recycled and adapted from the stock of scenic materials already used in previous entertainments staged at Dorset Garden, a stock that “dictated, to an important degree, what exactly Behn was able to represent in the culminating satirical masque.”⁹⁰

Coppola’s description of the final scene here draws to our attention another tradition of elaborate dramatic spectacle with which Behn’s *Emperor* shares a similarly close, if less immediately obvious, relationship: the Stuart court masque. It is to the historical context of the court masque that I now turn, in order to consider the material and conceptual links between Behn’s *Emperor* and the court entertainments from which it, like all Restoration drama, drew its scenic apparatus.

The court masque—a performance with roots in medieval Continental court pageants, originally brought to England by Henry VII—grew to become an integral part of Stuart court culture and political life during the reigns of James I and Charles I.⁹¹ Masques organized dance, song, verse, and stunning scenic effects around and through the bodies of powerful court figures, including the monarchs themselves (either as participants in the masque or as its privileged spectators). In doing so, the masques simultaneously demonstrated and worked to generate the monarch’s interlinked political,

⁸⁹ See Todd S. Gilman, “London Theatre Music 1660-1719,” in *A Companion to Restoration Theatre*, ed. Susan J. Owen (Oxford: Blackwell, 2001): 243-273 for semi-operas, Coppola for machine operas, and Milhous for multimedia and Dorset Garden spectaculars.

⁹⁰ Coppola, 495-96

⁹¹ Marion Wynne-Davies, “The Queen’s Masque: Renaissance Woman and the Seventeenth-Century Court Masque,” in *Gloriana’s Face: Women, Public and Private, in the English Renaissance*, ed. S.P. Cerasano and Marion Wynne-Davies (Detroit: Wayne State University Press, 1992), 81.

economic, and social power. Masques were quite different from the drama of the contemporaneous public stage: while professional performers sang and spoke verse in masques, the courtiers who were the entertainments' most important participants performed silently, making meaning through their elaborately costumed and choreographed bodies.⁹² Notably, and in part because of the convention of silent performance, both male and female courtiers could participate in masquing, and queens Anna and Henrietta Maria were both frequent patrons of and performers in court masques during their reigns.⁹³ While masque texts were written by prominent playwrights like Ben Jonson, this text was far from the most important part of the proceedings. More germane to the political theatre of the Stuart court were the evanescent, occasional aspects of the entertainment, such as the courtiers chosen to perform in the masque, the symbolic formations they created through their choreographed and spontaneous movements, and the exquisite scenery and scenic machines that were customarily torn apart as an extension of the performance in a calculated display of conspicuous destruction.⁹⁴ As a political event, the masque thus functioned within a code of courtly display through which "virtue was defined as the creation of its appearance"⁹⁵ and power worked "primarily by making itself visible";⁹⁶ in this paradigm, the "artful trifle" was

⁹² My description of the masque draws on Clare McManus, *Women on the Renaissance Stage: Anna of Denmark and Female Masquing in the Stuart Court* (Manchester: Manchester University Press, 2002), particularly 1-17.

⁹³ See McManus, as well as Sophie Tomlinson, *Women On Stage in Stuart Drama* (Cambridge: Cambridge University Press, 2005).

⁹⁴ McManus, 5, 9-10.

⁹⁵ McManus, 8.

⁹⁶ David Bevington and Peter Holbrook, introduction to *The Politics of the Stuart Court Masque*, ed. Bevington and Holbrook (Cambridge: Cambridge University Press, 1998), 3.

imbued with consequence, “the surface was, in a sense, precisely what mattered,” and “the trivial assumed a startling importance.”⁹⁷ The monarch, who viewed the proceedings from the location at which the masque’s perspectival effects appeared to the greatest perfection, performed his or her mastery of this opulent spectacle and, metonymically, of the court, the nation, and the natural world.⁹⁸ As Stephen Orgel writes, the masque’s “vision of nature controlled by the human intellect,” a vision created through its spectacular effects, is “a central way of expressing the sovereign’s place in the Renaissance universe.” As a “ritual in which the society affirms its wisdom and asserts its control over the world and its destiny,” it is grounded in a “concept of science”:⁹⁹ a science that functions optically, but not empirically. Francis Bacon might dismiss the court spectacles as “Toyes” prone to the display of “childish Curiosit[ies]” and “Petty Wonderments,”¹⁰⁰ and Jonson could complain, in a disparaging poem about the entertainments’ scenic designer Inigo Jones, that “Painting and carpentry are the soul of masque,”¹⁰¹ but the masque’s power lay precisely in its organization of seemingly trivial material effects. While Jonson would attempt to enshrine his poetry as the masque’s “spirit” enlivening the proceedings’ material, ephemeral “carcass” in the published text of

⁹⁷ Bevington and Holbrook, 3.

⁹⁸ Stephen Orgel, *The Illusion of Power: Political Theatre in the English Renaissance* (Berkeley: University of California Press, 1975), 10-11.

⁹⁹ Orgel, 54-55.

¹⁰⁰ Francis Bacon, “Of Masques and Triumphs,” in *The Essayes or Counsels, Civill and Morall*, ed. Michael Kiernan (Oxford: Clarendon Press, 1985), 117.

¹⁰¹ Ben Jonson, “An Expostulation with Inigo Jones,” in *The Complete Poems*, ed. George Parfitt (London: Penguin, 1975), ln 50.

Queen Anna's 1605 *Masque of Blackness*, it was this "bodily part" that produced the entertainment's meaning, and its political and social force.¹⁰²

It was the Stuart masques' so-called bodily part—specifically, the scenic technologies Jones had introduced to England through these court entertainments—that lived on in Restoration stagecraft. A number of critics have observed that the Dorset Garden machine operas, of which *Emperor* is a notable example, restaged the spectacular effects of the Stuart court masque in the context of an English commercial theatre that had, before the Restoration, eschewed the elaborate scenic devices the court masque shared with Continental dramatic traditions.¹⁰³ The links between court masque and machine opera are more than notional, as is evident when we trace William Davenant's career across the Civil War. Davenant, who was appointed Charles I's poet laureate after Jonson's death, composed the text for a number of court masques in the late 1630s. All of Davenant's masques—*The Temple of Love* (1635), *Brittania Triumphans* (1638), *Luminalia* (1638), and *Salmacida Spolia* (1639), the last Caroline masque—were produced in collaboration with Inigo Jones, who provided the "carcass," designing the entertainments' sets, machines, scenic effects, and costumes.¹⁰⁴ Then, during the

¹⁰² Ben Jonson, "The Queen's Masques, The First, of BLACKNESS," in *The Complete Masques*, ed. Stephen Orgel (New Haven: Yale University Press, 1975), 47, 50.

¹⁰³ See, for example, Montague Summers, *The Restoration Theatre* (London, K. Paul, Trench, Trubner, 1934), especially page 227, and David Thomas, *Theatre in Europe: A Documentary History – Restoration and Georgian England 1660-1788* (Cambridge: Cambridge University Press 1989).

¹⁰⁴ *Oxford Dictionary of National Biography*, s.v. "Davenant [D'Avenant], Sir William (1606–1668)," by Mary Edmond, last modified October 2009, doi: 10.1093/ref:odnb/7197.

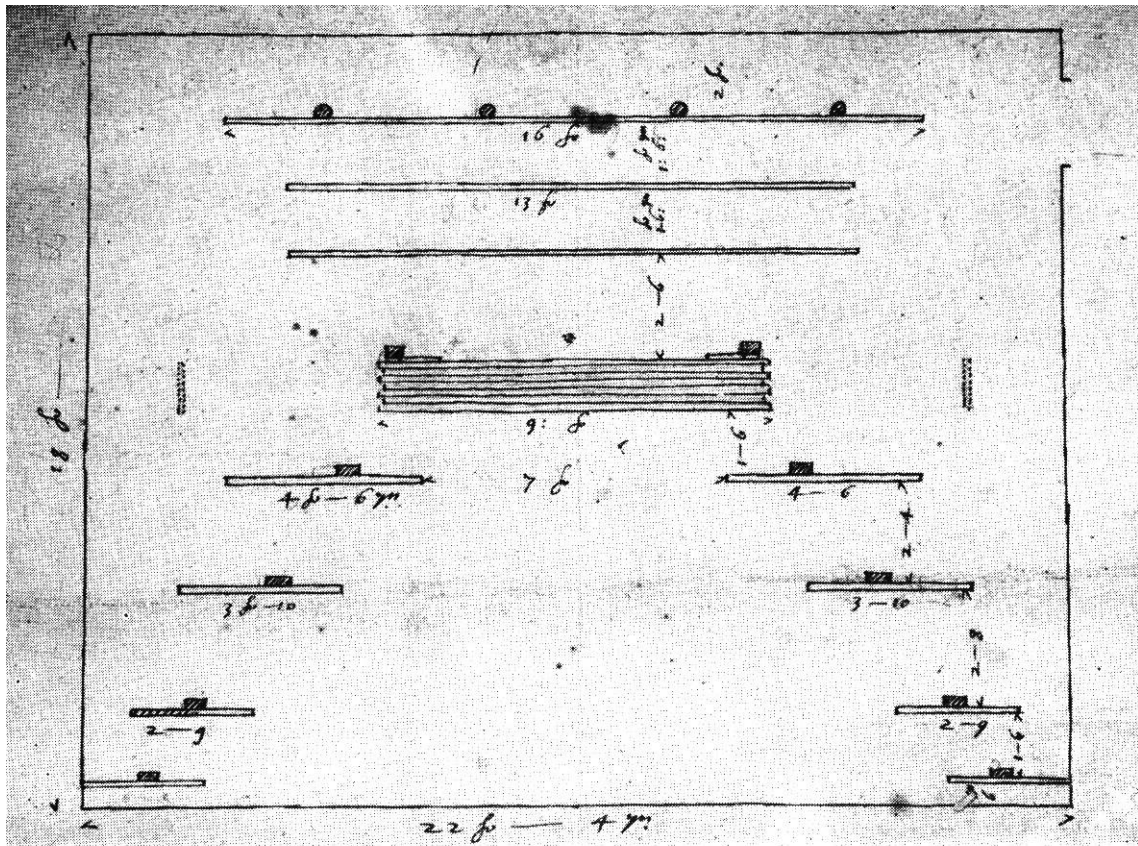


Figure 2: John Webb, Plan of the stage for *The Siege of Rhodes*, 1658, via <http://restorationstaging.com>.

interregnum, Davenant wrote and produced *The Siege of Rhodes* (1656), considered the first English opera, calling on John Webb (Jones's nephew and pupil) to provide the scenic design.¹⁰⁵ *Rhodes*, performed at Davenant's residence, "reveals the impress of Davenant's own schooling in the masque tradition... virtually at every turn,"¹⁰⁶ particularly in its vivid use of perspective scenery in the style of Jones.¹⁰⁷ Figure 2, for example—a diagram drawn by Webb showing an overhead view of the planned stage for

¹⁰⁵ Richard Kroll, "William Davenant and John Dryden," in *A Companion to Restoration Drama*, ed. Susan J. Owen (London: Blackwell, 2001), 311.

¹⁰⁶ Kroll, 314

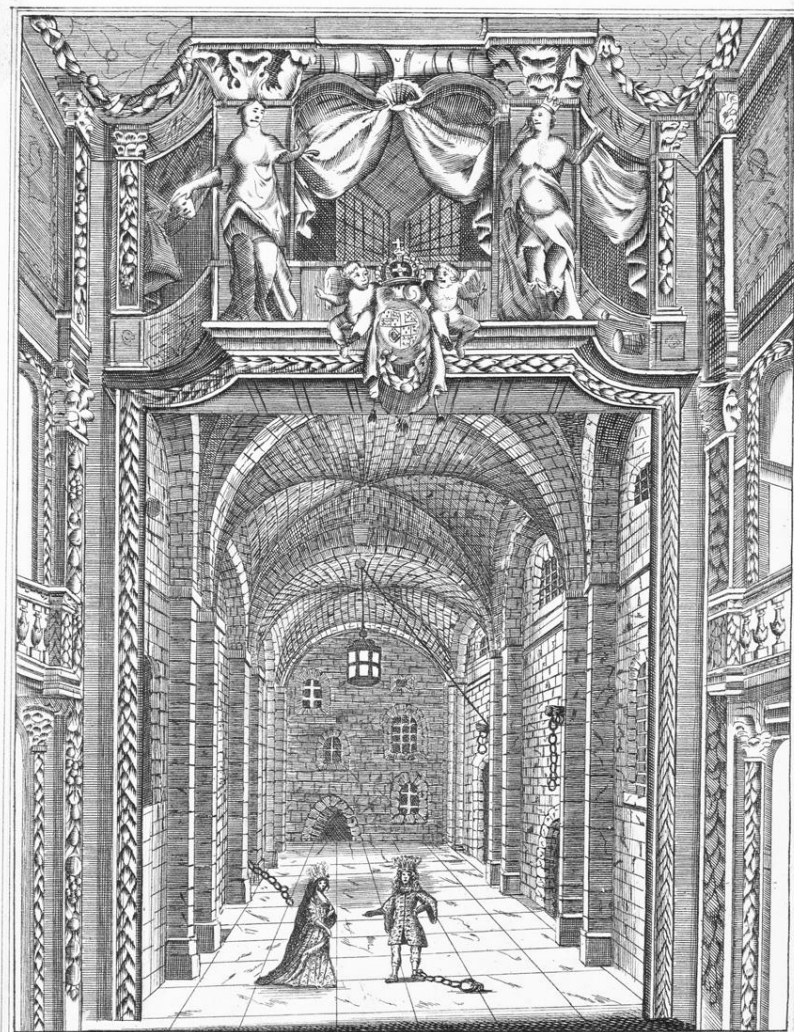
¹⁰⁷ Tomlinson, 58.

Rhodes—shows moveable scenic flats staggered up the stage space to create the illusion of depth, a technique taken directly from Jones’s court masques. *Rhodes*, a semi-public show that used the scenic technologies of the masque, stands as a bridge between the entertainments of the Stuart court and the dramas of the public theatre: a public theatre that, once re-established after the Restoration, would adopt the same scenic conventions, largely through Davenant’s influence. Granted control of the Duke’s Company, one of only two theatre companies in Restoration London, Davenant quickly established “the basic framework and structure of the scenic stage”¹⁰⁸ at his theatre at Lincoln’s Inn Fields by explicitly following in the tradition of Stuart court entertainments.¹⁰⁹ From the beginning Davenant’s company was known for the scenic magnificence of its drama, and the success of this new style of theatre ultimately pushed the rival King’s Company to emulate it in order to compete. Our only visual record of the Duke’s Theatre at Lincoln Inn Fields—in an illustrated edition of Settle’s 1673 *Empress of Morocco*—clearly shows the same perspectival depth and scenic lavishness evident in Webb’s record of *The Seige of Rhodes*, and of the Stuart masques it echoed (see fig. 3). The construction of the Duke’s Company’s Dorset Garden Theatre in 1670—“equipped with up-to-date Continental stage machinery” and “well-suited to mounting lavish productions”¹¹⁰ allowed for the presentation of ever more elaborate spectacles, including the machine

¹⁰⁸ Thomas, 83.

¹⁰⁹ Edward A. Langhans, “The Theatre,” in *The Cambridge Companion to English Restoration Theatre*, ed. Deborah Payne Fisk (Cambridge: Cambridge University Press, 2000), 6.

¹¹⁰ Thomas, 54.



INSIDE OF THE DUKES THEATRE
in Lincoln's Inn Fields .
as it appeared in the reign of King Charles II.

This view represents the stage of the above Theatre, and its very elegant frontispiece, during the performance of a scene from Elkanah Settle's Empress of Morocco. The Theatre itself was deserted twelve years after its foundation, for the one in Dorset Gardens; being found too small and incommodious for the company that visited it. Part of it was discovered by the late fire in "Bear Yard." Its size must have been extremely small, compared with our present Theatres.

Figure 3: Illustration of the interior of the Duke's Theatre at Lincoln Inn Fields, representing a production of Elkanah Settle's *Empress of Morocco* (1673), via the Victoria & Albert Museum, <http://www.vam.ac.uk/content/articles/0-9/17th-century-theatre/>

operas that are our primary concern here.¹¹¹ It is important to note, however, that while Davenant's influence was certainly crucial to the presence and popularity of these overtly masque-like entertainments on the Restoration public stage, the effects of his scenic innovations at the Duke's Company theatre were far more widespread. As Southern demonstrates, *all* of the new scenic technologies and effects introduced onto the commercial stage after the Restoration—changeable scenery and the discovery scenes it enabled chief among them—had their roots in Stuart court theatre.¹¹²

Before I move to consider the way these technologies functioned and signified differently on the Restoration commercial stage than in the early modern court one, it is important to consider their relationship to another new addition to the public stage: the actress. As I noted above when discussing the discovery scene, scenic technologies and the actress's body were often deployed in conjunction to produce visually (and erotically) appealing stage effects. As Laura Rosenthal has argued, scenes and actresses were both part of a reorientation of the theatre experience towards spectatorship. In contrast to the pre-civil-war public theatre, in which the primary experience of the audience was auditory and acting was conceived of as a form of oratory,¹¹³ the Restoration theatre was organized around "new visual objects and pleasures," as "[m]anagers overran their budgets to create a theatre of illusion; complex scenery replaced the bare Elizabethan stage; elaborate costumes and wigs became an important part of any show," and "women

¹¹¹ Davenant died before the new theatre was completed; his protégé and successor Thomas Betterton would continue in the Davenant tradition, becoming an "acknowledged master of spectacular and operatic theatre" (Thomas, 105).

¹¹² Southern, 32-35, 138.

¹¹³ Orgel, 19-20.

actors achieved fame for their beauty and notoriety for their homeliness.”¹¹⁴ Diamond notes that “painted female performer and painted scenes” were often imaginatively conflated by audiences and critics,¹¹⁵ an assertion supported by the writings of, for example, John Dennis—who identifies “Scenes and women” as the main innovations of the Restoration stage’s “Dramatick Actions”¹¹⁶—and Shadwell, who contrasts the “rusty Arras...and thredbare plays” of antebellum England, which featured neither “Scenes nor Women,” with the “new wayes” of the modern theatre in his prologue to *The Tempest*.¹¹⁷ This conflation was ambivalent at best and misogynistic at worst, as when Robert Gould’s attack on the theatres in 1689’s *The Playhouse: A Satyr* singled out “the women...Audacious seen / All paint their outsides and all pox within” for invective, characterizing the actress’s body as a sham analogous to the scenic devices that created thin visual fictions onstage. Likewise, Samuel Pepys’s famous visit to the “Scene-room” of the Theatre Royal after a play finds him reflecting on stage effects as he writes about Nell Gwynn and Elizabeth Knepp (his sometime lover) that “Lord, to see how they were both painted would make a man mad – and did make me loath them...and yet what a show they make on the stage by candlelight, is very observable.”¹¹⁸ Surrounded by scenic flats, the two actresses come to resemble them as representations that function pleasingly

¹¹⁴ Laura J. Rosenthal, “Reading Masks: The Actress and Spectatrix in Restoration Shakespeare,” in *Broken Boundaries: Women and Feminism in Restoration Drama*, ed. Katherine M. Quinsey (Lexington: The University Press of Kentucky, 1996), 204.

¹¹⁵ Diamond, 524.

¹¹⁶ Quoted in Deborah Payne, “Reified Object or Emergent Professional? Retheorizing the Restoration Actress,” in *Cultural Readings of Restoration and Eighteenth-Century English Theater*, ed. J. Douglas Canfield and Deborah Payne Fisk (Athens: University of Georgia Press, 1995), 27.

¹¹⁷ Quoted in Diamond, 522.

¹¹⁸ Pepys, 834.

while playing but appear as unsettlingly false bits of artifice when seen off the stage. Women, then, as much as the scenic apparatus, made up the “gloss’d outside Fallacies” of the playhouse—those things that “show things inwards, when they are but superficial paintings”—that Power cited in the dismissive analogy I quoted above. This perceived likeness between scenes and women was so strong that, as Rosenthal shows, “[w]hen the King’s Company lost its lavish theater and scenery to a fire in 1672, it attempted to regain its audience by offering all-female performances as visual compensation.”¹¹⁹ While the politics of women’s performance had worked quite differently in the masque, in which silent dancing by royal and noble women was aligned with the enactment of courtly virtue, this consonance between body and scenic object remains a site of continuity between the two performance contexts. Sophie Tomlinson points out that “[t]he fact that women in masques were mute meant that the power of their performance lay chiefly in their sumptuous appearance and physical movement,”¹²⁰ and McManus emphasizes that the silent female masquer, “[d]enied access to spoken text,” so “appears to have been aligned only with the carcass, with the physical aspects of the masque” such as its scenic technologies.¹²¹

Behn’s staging in *The Rover* of the sign of Angellica—a series of three paintings that advertise the availability of prostitute Angellica Bianca, and that, over the course of the play, “produce an image of her” while simultaneously “reduc[ing] her to that image”—signals, as Diamond argues, the playwright’s critical engagement with the

¹¹⁹ Rosenthal, “Reading Masks,” 204.

¹²⁰ Tomlinson, 21.

¹²¹ McManus, 10,

“epistemological link between the theater apparatus and illicit female signs.”¹²² As the painted woman at the center of telescope trick suggests, this engagement is an important part of Behn’s critique of technological empiricism in *Emperor*, and another in the long series of tricks played upon Baliardo makes the role of the staged female body in this critique even more apparent. The trick occurs in the second act, when the Dons and their lovers take advantage of Baliardo’s absence from his home by throwing a masked ball there. The doctor returns home unexpectedly, however, and Scaramouch improvises a solution to avoid Baliardo’s inevitable displeasure at the illicit revelry. He quickly leads the merrymakers behind a curtain (which, at this point in the action, is the only scenic property visible onstage): behind the curtain hangs a tapestry, and, as the stage direction tells us, Scaramouch “plac[es] them all in the hanging, in which they make the figures, where they stand without motion in posture” (2.3.60). As the doctor bursts into the room demanding to know what has been going on, “the curtain draws up, and discovers the [hanging] where all of them stand,” which Scaramouch explains is a “piece of tapestry; the best in Italy, for the rareness of the figures, sir”—a gift that has supposedly been sent to Baliardo by Charmante’s sham cabalist (2.3.83-90). The doctor, who “takes a perspective [here, a magnifying glass] and looks through it” to better make out the details of the tapestry, comments approvingly that he “likes the figures well” (2.3.100-110). Finally, the posed revelers jump out of their positions and run away, with Scaramouch

¹²² Diamond, 534, 523. Angellica’s sign has latterly proved a rich hermeneutic for feminist scholarship, with, for example, Janet Todd’s *The Sign of Angellica* (London: Virago, 1989) positioning the painted representation as a key metaphor for female authorship across the Restoration and eighteenth century.

playing the experience off as a shared dream experienced by himself and Baliardo at the behest of the Emperor of the Moon, a fiction the doctor accepts in turn.

This trick—which, with its reveal of the false tapestry, includes the first actual stage discovery of the play—extends the critique Behn detailed in Baliardo’s earlier telescopic deception. Once again staged bodies—which include Harlequin and the Dons, but are otherwise made up of a large group of women—are offered up for the doctor’s appreciation, and, once again, he is unable to discern their true nature, even as he examines them through an optical instrument. More specifically, and reversing the misapprehension of the previous trick, Baliardo’s empirical eye mistakes a series of elaborately costumed, painted, and posed bodies for a two-dimensional representation: that is, he makes the same mistake that Restoration spectators who conflated scenes with women repeatedly did. Frozen in place before the tapestry, the actresses at Dorset Garden impersonate superficial representations available for male scrutiny, but instead of being deciphered by this scopic analysis, they mock its flattening gaze. Behn’s trick is one that plays the supposed indistinguishability of actress and stage apparatus (as frivolous surfaces) for laughs, with their misperceiver as the butt of the joke. As they exceed the radical objectification that aligns them with scenic properties, the actresses’ bodies, arranged before the tapestry to compose what Baliardo calls a “story,” and attired in “masking habits,” recall the silent, emblematic bodies of masquing women (2.3.1, 99).¹²³

Behn—who, as one scholar of Stuart court performance recognizes, was engaged in

¹²³ In addition to the dancing female body to signify poetic and political meaning, masques also featured stilled bodies in emblematic poses. See, for example, Thomas Campion’s *Lord’s Masque*, which was performed for James and Anna in 1613 and featured female courtiers as silver statues (later transformed to dancing women); McManus discusses this entertainment in *Women on the Renaissance Stage*, 149-162.

“pillaging, but also transforming” the “cultural materials” of early seventeenth-century drama¹²⁴—here recalls a performance tradition in which the female body was “the locus of action and meaning,” holding significant poetic and political power despite (and, in many ways, because of) its alignment with the scenic apparatus’s opulent surfaces.¹²⁵ In Behn’s tapestry trick, as in the earlier telescope trick, these surfaces deceive Baliardo only because he is unable to read them correctly. Even as Behn ridicules those who would reduce women to “gloss’d outside Fallacies,” she affirms the power of the playing female body as an eloquent ornament.

Turning from the actress to the elaborate scenic apparatus that joined her on the Restoration stage, we can see a similar ambivalence, in contemporary responses, about the pleasures these scenes afforded their spectators. While the new scenic technologies were undoubtedly popular with Restoration audiences (as the King’s Company’s quick adoption of them in the face of the Duke’s Company’s success demonstrates), there was nonetheless a considerable and sustained anxiety about these technologies’ effects on the dramatic works they accompanied, and on playgoers. One such expression of discomfort with the new dramatic conventions can be found in James Wright’s history of English drama, *Historia Histrionica* (1699). In it, Wright argues that the history of dramatic arts can offer readers an understanding of the “Manners and Behaviour of several Ages,” since “Plays are exactly like Portraits drawn in the Garb and Fashion of the time when

¹²⁴ Tomlinson, 207.

¹²⁵ Barbara K. Lewalski, *Writing Women in Jacobean England* (Cambridge: Harvard University Press, 1993), 30; quoted in Tomlinson, 19. The fact that the actors are arranged in front of a tapestry—which was one of the few scenic elements present on the pre-civil-war public playhouse in England, as Shadwell’s reference to the “rusty Arras” of the antebellum stage hints—further suggests that the staging of this trick is engaged with the history of theatrical representation.

Painted.”¹²⁶ If this is so, Wright has reason to be worried about the current age: when comparing the present state of drama with the pre-civil-war playhouse, he reflects that

[i]t is an Argument of the worth of the Plays and Actors, of the last Age, and readily inferr’d, that they were much beyond ours in this, for consider that they cou’d support themselves, merely from their own merit; the weight of the Matter, and goodness of the Action, without Scenes and Machines: whereas the present Plays with all that show, can hardly draw an Audience, unless there be the additional Invitation of a *Signior Fideli*, a *Monsieur L’abbe*, or some such Foreign Regale exprest in the bottom of the Bill. (6)

In Wright’s view, scenic technologies are a supplement that have inappropriately overtaken the “Matter” and “Action” of plays, leaving the Restoration plays artistically and commercially compromised. Lacking the substance that characterized earlier dramatic works, the companies, Wright argues, are now reduced to seeking out novelty acts that mirror the scenic apparatus’s flashy, suspiciously foreign appeal (*Signior Fideli* was an Italian castrato¹²⁷) to draw even modest crowds to their shows. Wright’s critique echoes one voiced by Thomas Rawlins in the prologue to his play *Tunbridge-Wells*, mounted at Dorset Garden in 1678. Like Wright, Rawlins accuses English drama of too cozy a relationship with the Continent:

[The] Old English Stage, confin’d to Plot and Sense,
Did hold abroad but small intelligence,
But since th’invasion of the forreign Scene,
Jack pudding Farce, and thundering Machine,
...
There’s not a Player but is turned a scout,
And every Scribler sends his Envoys out
To fetch from *Paris*, *Venice*, or from *Rome*,

¹²⁶ James Wright, *Historia histrionica: An historical account of the English stage, shewing the ancient use, improvement and perfection of dramattick representations in this nation in a dialogue of plays and players* (London: G. Croom, 1699), ii, EEBO. References are to this edition.

¹²⁷ See Kathryn Lowerre, *Music and Musicians on the London Stage, 1695-1705* (London: Ashgate, 2009), 334, and J. Merrill Knapp, “Eighteenth-Century Opera in London Before Handel, 1705-1710,” in *British Theatre and the Other Arts, 1660-1800*, ed. Shirley Strum Kenny (Washington: Folger, 1984), 93.

Fantastick fopperies to please at home.¹²⁸

Rawlins is probably referencing the trips that Duke's Company manager Thomas Betterton took to France to gather information on the latest developments in Continental stage production.¹²⁹ In fact, Betterton had been sent on these fact-finding missions by the king himself, in an assignment that reflects the ways in which the scenic conventions of the English masque (now transferred to the public stage) had always been more intimately linked with Continental traditions than with domestic drama. For Rawlins, the long-standing English court tradition is, however, obscured behind the threat of the "Fantastick fopperies" now reigning in the playhouses, in entertainments that flout the traditions of the "Old English Stage" with an alien visual language. The prologue continues with a complaint that recalls Ben Jonson's attack on Inigo Jones: "With what strange Ease a Play may now be writ," Rawlins writes, "When the best half's composed by painting it? / And that in th'Ayr, or Dance lyes all the Wit?" Rawlins accuses English drama of an overinvestment in material, bodily effects, such that if their antitheses, "True Sense or Plot," ever appeared onstage, they would be misrecognized as "fooleries." From the stage of a theatre most famous for its extravagant scenic showpieces, Rawlins characterizes his audience as a collection of vapid spectators clamoring only for the "strange surprize" of seeing "An Actress in a Cloud," a display for which they have "paid trebble"—a shot at the prices of machine operas, which were raised ever-higher to cover the cost of scenic effects.¹³⁰ Like so many others, this attack on the "bodily part" of

¹²⁸ Thomas Rawlins, *Tunbridge-Wells, or, A days courtship, a comedy: as it is acted at the Dukes-Theatre* (London: Henry Rogers, 1678), 1, EEBO.

¹²⁹ Powell, 43, and Milhous, 42.

¹³⁰ Milhous, 48.

Restoration stagecraft is one that conflates scenes and women, painted actress and painted cloud. For Rawlins, this triumph of the carcass at Dorset Garden ultimately comes at the expense of English reason. It is interesting to note, then, that as soon as the prologue ends, *Tunbridge-Wells* begins with a discovery scene: the hero is “*discovered dressing*” in his rooms. Though Rawlins purports to reject the anti-rational effects of scenic technologies, their optical strategies nonetheless covertly structure his own drama.

The prologue of Mary Pix’s *The Deceiver Deceived* (1698) presents another vigorous critique of Restoration scenic conventions. Pix wrote the prologue to address the King’s Company’s plagiarism of *The Deceiver Deceived* (the company had rejected the play, then replicated much of it in another production at Drury Lane).¹³¹ From the stage of the Duke’s Theatre at Lincoln’s Inn Fields, the prologue duly begins with a condemnation of the rival company’s dishonesty:

Deceiver Deceiv’d and Imposter cheated!
An Audience and the Devil too defeated!
All trick and cheat! Pshaw, ‘tis the Devil and all,
I’ll warrant ye we shall now have cups and ball;
No, Gallants, we those tricks don’t understand
Tis t’other House best shows the slight of hand...

After dismissing the other company’s shows as a collection of cheap trickeries, Pix immediately moves to link this deceptiveness with the drama’s material qualities:

With powder[ed]-pimp of Dance, Machine, and Song,
They’ll spin ye out short nonsense four hours long;
With Fountains, Groves, Bombast and airy Fancies
Larded with Cynthias, little Loves and Dances;
Which put together make it hard to say

¹³¹ Jane Milling, “Mary Pix, Prologue, *The Deceiver Deceived* (1698),” in *Reading Early Modern Women: An Anthology of Texts and Manuscript in Print, 1550-1700*, ed. Helen Ostovich and Elizabeth Sauer (New York: Routledge, 2004), 394.

If Poet, Painter, or Fidler made the Play.¹³²

Pix here voices another echo of Jonson's condemnation of Jones, arguing that the company's overreliance on scenic and bodily spectacle produces a string of dazzling vapidities devoid of any real artistic or intellectual merit, and which inappropriately elevate trivialities to an epic scope. In a prologue that works to defend Pix's status as "Authoress" and "True [woman]," her claim is premised on a juxtaposition of poetic work possessed of substance and frivolous show comprised only of false surface. In so accusing the King's Company—which, as we have seen, participated in but was not as strongly associated with these kinds of scenic strategies as Davenant and Betterton's Duke's Company—Pix demonstrates how the scenic conventions of the Restoration stage came to be a kind of shorthand for a particular mode of deceptive superficiality, one associated with the "powder-pimped," ornamental female body. By calling on this shorthand, Pix is able to quickly defend her artistic practice as "True" and deprecate her rivals' as a debased, tricking "nonsense." Like Rawlins, however, Pix's steady use of discovery scenes in *The Deceiver Deceived* demonstrates her own investment in the scopic play of paint and machine she disparages here.

An earlier, similarly ambivalent reflection on the state of Restoration dramatic arts indicates how, from the beginning, the introduction of scenic technologies to the public stage was seen to mark a significant shift in both the drama itself and, perhaps more importantly, in the way this drama affected its spectators. In 1664, Richard Flecknoe appended a "Short Discourse of the English Stage" to the published text of his

¹³² Mary Pix, *The Deceiver Deceived, A Comedy* (London: R. Basset, 1698), 3, EEBO.

play *Love's Kingdom*, which had been staged rather unsuccessfully at Lincoln's Inn Fields. Flecknoe, moved like so many others to consider "the difference betwixt our Theaters and those of former times," reflects that pre-civil-war productions

were but plain and simple, with no other Scenes, nor Decorations of the stage, but onely old Tapestry, and the stage strew'd with Rushes (with their Habits accordingly) whereas ours now for cost and ornament are arriv'd to the heighth of Magnificence; but that which makes our stage the better, makes our Playes the worse perhaps, they striving now to make them more for sight, than hearing; whence that solid joy of the interior is lost, and that benefit which men formerly received from Playes, from which they seldom or never went away, but far better and wiser then they came.¹³³

Flecknoe nostalgically imagines an era in which plays' intellectual substance instilled a corresponding wisdom in their audiences, and contrasts this golden age with the present day, in which drama, having dispensed with depth altogether, is characterized primarily by a surface "ornament" and "Magnificence." Yet when he turns to consider the scenic apparatus more closely, Flecknoe is clearly enthralled by this very splendour: "Scenes and machines," he writes,

are excellent helps of imagination, most grateful deceptions of the sight, and graceful and becoming ornaments of the stage, transporting you easily without lassitude from one place to another; or rather by a kind of delightful Magick, whilst you sit still, does bring the place to you.

In this description, the ornamental, tricking qualities of scenic technologies—their "gloss'd outside Fallacies"—are shown to be central to the unique pleasures of modern drama, as the striking discoveries the scenes and machines enable produce novel experiences of the playhouse space, and of space and time more generally. More

¹³³ Richard Flecknoe, *Love's Kingdom, A Pastoral Trage-comedy: not as it was acted at the theatre near Lincolns Inn, but as it was written, and since corrected...with a short treatise of the English Stage, &c., by the same author* (London: R. Wood, 1664), np, EEBO.

intriguingly, Flecknoe's characterization of scenes and machines as "excellent helps of the imagination" suggests that these technologies have some kind of relationship with their spectators' subjectivity which, if it does not resemble the "solid joy of the interior" supposedly produced by the drama of former times, is no less potent. This suggestion is extended when we consider the epistle dedicatory of *Love's Kingdom*, the play text to which Flecknoe's reflections on drama are attached.¹³⁴ Flecknoe writes that he hopes the published version of the play will find more approbation than the produced one, which was not "rightly represented."¹³⁵ While Flecknoe believes that printing the play will "shew its Innocence" of the failings ascribed to it by the bad production, he notes that in its printed version it "wants much of the Ornament of the Stage": this, however, "by a lively imagination may easily be supplied." Flecknoe's dedication reveals that the scenes and machines seen to "ornament" dramatic works are in fact crucial to the plays, such that they must be provided in their absence to approximate the dramatic experience. Further, Flecknoe's assurance that his readers will easily be able to supply these effects shows that, barely three years after their debut on the public stage, scenes and machines had become "helps of the imagination" not only to the spectator witnessing their action in the playhouse, but to the same subject well after she or he had left the performance space. This dedication reveals that, counter to Flecknoe's later assertion, the new scenic plays

¹³⁴ The dedicatee is Flecknoe's patron, the Duke of Newcastle.

¹³⁵ Paul Hammond suggests that Flecknoe's dismissal of the new scenic effects in his "Short Discourse" is an attack on Davenant specifically, as a kind of revenge for the failure of *Love's Kingdom* when the Duke's Company performed it. Flecknoe's immortalization as a hack in Dryden's *Mac Flecknoe* suggests that the failure may have stemmed from the text rather than the production. See *Oxford Dictionary of National Biography*, s.v. "Richard Flecknoe (b. c. 1605, d. in or after 1677)," by Paul Hammond, last modified 2004, doi: 10.1093/ref:odnb/9682.

do, in fact, produce joys of the interior. Describing the imagination as a moving toyshop through which the playhouse's pleasurable visual and epistemological discoveries may be continually restaged (and new ones created), Flecknoe demonstrates how scenic technologies quickly found their double in a mental machinery.

The critical comments from Wright, Rawlins, Pix, and Flecknoe I have analysed above express a number of the ways that scenic technologies signified differently once they were displaced from the Jacobean and Caroline court, where their conventions had been developed, to the public, commercial Restoration playhouse. While in the Stuart court the masque's splendour had functioned visually and politically as part of a system in which status depended "for its very existence upon material display," where power was "either visible or non-existent,"¹³⁶ and in which this play of surfaces functioned symbolically as a scientific revelation of truth, in the context of the public stage and of a public that came increasingly to value a subjectivity imaginatively comprised of interior depth, the same scenic maneuvers came to appear to some suspiciously superficial, trifling, and deceptive. As a trivial, aggressively material mechanism believed to transmit its triviality both to the drama it structured and to that drama's spectators, the scenic apparatus is deprecated in these critiques as a kind of gimcrack. Like the gimcrack lampooned by critics of technologically-mediated experimentalism, scenic technology is made suspicious through its association with ostentatious materialism and frivolous display; like the gimcrack, it is linked with the superficial, ornamental female body; like the gimcrack, it was believed to make those whose perception it mediated "serious upon

¹³⁶ Bevington and Holbrook, 3-4.

trifles”; like the gimcrack, it produced an empirical experience, and thus a subjectivity, inappropriately informed by spectacular fantasy. In different but importantly linked ways, the scientific and scenic gimcrack are both optical technologies that signal the Restoration subject’s unstable, rapidly shifting experiences of material culture, empirical knowledge, and gendered embodiment.

The links between scientific instruments and scenic technologies ultimately structure the climax of Behn’s *Emperor*. Behn’s use of the most extravagant scenic effects able to be staged at Dorset Garden can only be seen as both deliberate and significant in the oeuvre of a dramatist noted for her creative and critical use of stagecraft but who, outside of this play, does not employ anything comparable to this kind of scenic spectacle. Moreover, with the final scene Behn has departed once more from her source text to produce a finale “much more elaborate than anything in the French scenes.”¹³⁷ Clearly the effects are implicated in the subject of the play and of the final scene more specifically, which enacts Baliardo’s recognition and repudiation of his perceptual errors. The stage tricks I have analysed above demonstrate how Behn uses the perceived equivalencies between scientific and stage technologies, and between stage technologies and the female body, to mount a sophisticated critique of Royal Society virtuosi and their optical apparatuses. Through her use of dazzling, masque-like staging techniques in the play’s closing scene—including multiple scenic discoveries; stylized, ornamental, and emblematic bodies; and complex machine effects—Behn draws on the history of scenes and machines and on the Restoration debate about their mediatory function to extend and

¹³⁷ Spencer, 326n. The telescope and tapestry tricks are likewise not present in the source text.

nuance this critique. We can see this in the language used in the closing moments of the play, as Baliardo comes to understand that what he is watching is a farce rather than a lunar visitation. “My heart misgives me...Oh, I am undone and cheated in every way!” Baliardo cries as Scaramouch deliberately shatters the illusion (3.3.191-92). The false Kepler exhorts Baliardo to “Be patient, sir, and call up all your virtue; / You’re only cured, sir, of a disease / That long reigned over your nobler faculties,” explaining that “It was not in the power of herbs or minerals, / Of reason, common sense, and right religion, / To draw you from an error that unmanned you” (3.3.193-99). Cintho soon joins “Kepler,” explaining to Baliardo that he is not the Prince of Thunderland and that there is “no such person, sir. / These stories are the phantoms of mad brains, / To puzzle fools withal; the wise laugh at ‘em”; Charmante concurs that the supposed moon world is merely a collection of “Ridiculous inventions” (3.3.213-18). Baliardo is convinced, and with a Faustian injunction to “Burn all my books, and let my study blaze,” he renounces his folly, thanking Charmante and Cinthio for the “glorious miracle” they have effected.

The doctor’s description of the elaborate show performed for him as a “cheat” recalls contemporary characterizations of stage effects as tricking “deceptions of the sight,” but the scene quickly complicates this identification. The designation “cheat” attaches with more force to the “phantoms” Baliardo has taken for reality because he has read about them and, more importantly, seen them through his telescope. As the play has repeatedly shown and this scene emphasizes, Baliardo’s optical instruments have failed to extend his perception, and act instead to confuse and obfuscate his faculties with ludicrous fantasies. And, while the scenic apparatus might at first appear to function in a

similar, straightforwardly deceptive way, we should notice that the elaborate show has succeeded in re-educating Baliardo where “reason, common sense, and right religion” have failed. The show accomplishes this through the revelation of its effects’ mechanisms, of their status as a simultaneously spectacular and trivial optical technology. In the finale’s series of escalating scenic discoveries, the third and most important exposure is of the technology of discovery itself. The final scene works to restage the discovery scenes Baliardo has totally misapprehended in the first and second acts, this time foregrounding the scenic apparatus as apparatus so that the doctor is able to recognize painted representations and tricking bodies for what they are. This final revelation does not suggest that scenic gimcracks are a collection of useless, bombastic nonsense: instead, they find their most fruitful use when they are recognized *as* gimcracks. It is, after all, the scenic spectacle—in all its superficial magnificence and powder-pimped knackery—that finally produces the most valuable empirical knowledge of the world for Baliardo: “I see there’s nothing in philosophy,” he finally declares, his language foregrounding the notably optical nature of his “glorious” lesson (3.3.230-31). This outcome is particularly significant given the links the play draws between scenic and scientific technologies. As I explored above, advocates of optical instruments, such as the Royal Society fellows, believed that these devices’ value inhered in their ability to accurately transmit objective facts about the world; the utter transparency of the instruments’ artificial operation was believed to repair and extend the limited perceptual faculties of the human body. This transparency of function was critical to the production of empirical truths: as Crary notes, “it was crucial that the distorting power of a medium,

whether a lens, air, or liquid, be neutralized, and this could be done if the properties of that medium were mastered intellectually and thus made effectively transparent through the exercise of reason.”¹³⁸ While Baliardo claimed this rational transparency for the operations of his optical instruments, Behn has repeatedly foregrounded the ways that the instruments’ material qualities interrupt and confuse their supposedly transcendent function. In the last scene, as Baliardo’s telescope fails to help him recognize its gimcrack double in the play’s scenic apparatus, the scenic technology takes over the scientific instrument’s role of revealing empirical information. Behn calls on the links between scientific discovery and scenic spectacle that the Royal Society fellows so vigorously attempted to deny, centering the scenic apparatus’s flamboyantly ornamental materiality as a mechanism of rational knowledge, and denouncing transparency as a cheat.¹³⁹ The play’s finale accomplishes what Behn promised *Emperor’s* dedicatee, the Marquis of Worcester: that a spectator of “refined sense” watching the play would, “through all the humble actions and trivialness of business, find nature there” (274). Behn’s dedication, which directs the spectator not to look past the play’s trivial trappings, but *through* them, positions its trifling apparatus as a technology of empirical revelation, one that substitutes material mechanism for rational transparency.

¹³⁸ Crary, 64

¹³⁹ The genre of Behn’s play contributes to this political critique, as farce was itself associated with trivial excess—for example, John Dryden wrote, in the preface to 1671’s *An Evening’s Love*, that farce “consists of forc’d humours, and unnatural events” and entertains with “what is monstrous and chimerical,” and Nahum Tate contrasted farce, whose “Business... is to exceed Nature and Probability,” with other genres, like tragedy and comedy, that “subsist upon Nature.” These assessments are quoted in Peter Holland’s “Farce,” in *The Cambridge Companion to English Restoration Theatre*, ed. Deborah Payne Fisk (Cambridge: Cambridge University Press, 2000), 121-22.

Behn's *Emperor* stands as a document of the shifting relationships that were forged between optical technologies and the human body in Restoration England, and of Behn's own interrogation of the ways their mechanisms mediated perceptual experience. Her critique of the optical instruments believed by some to correct the failings of human sense satirizes the mechanisms' gimcrack qualities: their immersion in a feminized realm of consumer display in which they circulate as showy knacks and useless ornaments. Behn's stance is familiar from attacks on the virtuoso launched from Shadwell to Addison, but her treatment of the relationship between technologies of the new science and of the new Restoration playhouse is not. Behn's recuperation of the gimcrack through *Emperor*'s extravagant culminating entertainment is a maneuver informed by her critical interest in material spectacle, an interest itself influenced by her feminism and Toryism. *Emperor* extends Behn's career-long project of using scenic design to explore the intersections of power, gender, space, and spectatorship on the Restoration stage, and links it with a complicated nostalgia for the traditions of court theatre. In the epistle dedicatory, Behn indicates the ways in which the play looks backward to the reign of the recently deceased Charles II (writing that the play was originally "calculated for his late majesty of sacred memory, that great patron of noble poetry, and the stage, for whom the muses must for ever mourn") and further still to the political theatre of the antebellum Stuart court. "[T]is a great pity," she writes, "to see that best and most useful diversion of mankind, whose magnificence of old was the most certain sign of a flourishing state, now quite undone by the misapprehension of the ignorant, and misrepresentings of the envious" (274). Behn has in mind the dramas of the past more generally (later mentioning

the “admirable plays” of Shakespeare, Fletcher, and Jonson), but the way she links staged magnificence and state power evokes most vividly the court masque’s organization of spectacular trivialities to generate political authority. It is this “useful diversion” that Behn restages with *Emperor*’s final act, arranging the masque’s scenic technologies into a new formation that produces empirical knowledge, and does so through the revelation of its own trifling mechanisms. With this final, extravagant show, Behn revises the Stuart masque’s symbolic science, and constructs a perceptual technology out of the materials cast off by the modest witness: the bodily part whose “gloss’d outside Fallacies”¹⁴⁰ his new scientific optics both renounced and promised to penetrate. The mode of personal and political power of which the masque was rapidly becoming a relic is thus revived, and its ornamental spectacle—now, increasingly, debased and feminized—occludes the philosopher’s instrumentalized vision in order to correct it. Behn’s play, as it lampoons Baliardo’s gimcrack misapprehensions, exposes and reframes the gendered binaries produced by the empirical subject’s technology of perception.

Emperor had a long afterlife: after *The Rover*, it is the most performed of Behn’s plays and was revived many times through the 1750s (after which it, like so many Restoration entertainments, was left behind). The play, and in particular the closing scene, became a vehicle for featuring new scenic effects; in an intriguing echo of the masques it drew on, *Emperor* was also often called on to entertain foreign dignitaries, probably because its scenic opulence was thought to offer a vision of English theatrical

¹⁴⁰ Power, 18.

(and national) glory that crossed linguistic barriers.¹⁴¹ The association between scenic apparatus and feminized frivolity that *Emperor* thematizes likewise survived well beyond the Restoration. We might recall, for instance, Alexander Pope's explanation of the "Machinery" that structures his mock-epic in the revised *Rape of the Lock*, using a literary convention drawn from stagecraft. "The *Machinery*, Madam," he writes to Arabella Fermor in the introduction, "is a Term invented by the Criticks, to signify that Part which the Dieties, Angels, or Daemons, are made to act in a Poem: For the ancient Poets are in one respect like many modern Ladies; Let an Action be never so trivial in it self, they always make it appear of the utmost Importance."¹⁴² It was, however, the virtuoso's mechanically augmented gaze that was to have the longest legacy. Two years after *Emperor* premiered at Dorset Garden, John Locke published *An Essay Concerning Human Understanding*, famously outlining a theory of empirical subjectivity in which "all the materials of reason and knowledge" are first supplied through the perception of "external sensible objects."¹⁴³ While Locke imagined this empirical subject as a blank page or empty cabinet, the most potent metaphor for that subject's rational perception was an optical instrument:

I pretend not to teach, but to inquire; and therefore cannot but confess here again, that external and internal sensation, are the only passages that I can find, of knowledge, to the understanding. These alone, as far as I can discover, are the windows by which light is let into this *dark room*. For, methinks, the *understanding* is not much unlike a closet wholly shut from light, with only some little openings left, to let in external visible resemblances, or ideas of things without; would the pictures coming into such a dark room but stay there, and lie

¹⁴¹ Jane Spencer, introduction to *The Rover and Other Plays* (Oxford: Oxford University Press, 1995), xxi.

¹⁴² Alexander Pope, *The Rape of the Lock: An Heroi-Comical Poem in Five Canto's*, in *Poetry and Prose of Alexander Pope*, ed. Aubrey Williams (Boston: Houghton Mifflin, 1969), 79.

¹⁴³ John Locke, *An Essay Concerning Human Understanding*, ed. Roger Woolhouse (London: Penguin, 2004), 109.

so orderly as to be found upon occasion, it would very much resemble the understanding of a man, in reference to all objects of sight, and the ideas of them. (158)

Locke's subject is a camera obscura, and his perceptual faculties the lenses that admit, focus, and order sensory information, forming a mechanism that converts objects into understanding. In Locke's paradigmatic description of the empirical subject, the optical mechanism's material qualities are subsumed as its apparatus is integrated into the subject, whose mode of perception has come so nearly to resemble the instrument that the two are indistinguishable. The Lockean subject perceived the world through a rational optical technology so transparent that its imperceptible operations could be taken for the body's own.



True Spectacles.

EXactly Ground on Brasse Tools, by John Parwell, Servant to His Majesty, approved on by the *Royal Society*, acknowledg'd by the best skill'd in Opticks to be ground to the greatest Perfection. Set neatly in Leather, Horn, Silver, or Torroise-Shell Frames. Telescopes of all lengths for Day and Night; Perspectives great and small; a new double Microscope invented by the said Parwell, fitted for all Uses, particularly that admirable Curiosity of seeing the Circulation of the Blood in small Fish, and Thousands of living Creatures in a drop of Pepper Water; Magnifying, Multiplying, and Weather-Glasses; Prisms, Concave Metal and Concave Burning-Glasses, Speaking-Trumpets, Reading-Glasses of all sizes; with all other sorts of Glasses both Concave and Convex, of the newest and most useful Invention.

All the above named Instruments are Made and Sold by John Parwell, who hath lived many Years in St. Paul's Church-Yard, is now removed to the Sign of Archimedes in Ludgate-Street, the first Spectacle-Shop next Ludgate

By John Parwell.

58...495

Figure 4: John Yarwell, *True Spectacles* (London, 1697), EEBO.

CHAPTER 2

Clarissa's Clockwork

In the critique of Hooke's *Micrographia* I quoted from in the previous chapter, Margaret Cavendish attacks not only the instruments' triviality, but also their lack of penetration. As she repudiates the techniques of the Royal Society, Cavendish contends that optical technologies offered, at most, to represent "exterior parts and superficies." These superficial observations are useless, she argues:

[f]or unless they could discover their interior, corporeal, figurative motions, and the obscure actions of Nature, or the causes which make such or such Creatures, I see no great benefit or advantage they yield to man.¹

It is true that microscopy stopped at the boundaries of bodies and objects, unable to offer access to what lay beneath. And yet, as Locke's reference to the camera obscura shows, just as stage technologies were doubled by a mental machinery that functioned independently of the objects themselves, scientific instruments were incorporated into Restoration subjects' modes of perception and understanding. These epistemological shifts, which made technological objects crucial to the production of what we now identify as interiority, also promised to discover those "obscure actions" hidden in other interiors. Hooke suggests as much in his introduction to the *Micrographia*, when he argues that the benefits of technological instruments far exceeds the exterior parts they allow him to examine; "It seems not improbable," he maintains,

but that by these helps the subtilty of the composition of Bodies, the structure of their parts, the various texture of their matter, the instruments and manner of their inward motions, and all the other possible appearances of things, may come to be more fully discovered; all which the antient *Peripateticks* were content to comprehend in two general and (unless further explained) useless words of *Matter*

¹ Cavendish, x.

and *Form*. From whence there may arise many admirable advantages, towards the increase of the *Operative*, and the *Mechanick* Knowledge, to which this Age seems so much inclined, because we may perhaps be inabled to discern all the secret workings of Nature, almost in the same manner as we do those that are the productions of Art, and are manag'd by Wheels, and Engines, and Springs, that were devised by humane Wit.”²

Distinguishing his artificially augmented perception from that of his Aristotelian predecessors, Hooke demonstrates how microscopy (and the technological experimentalism of which it is a part) changes not just what it is possible to see, but how it is possible to know. Hooke is empowered to comprehend the formerly obscure—nature’s “secret workings”—by conceptualizing nature itself as technological.

In this chapter, I consider the implications of this epistemological shift for one of the eighteenth century’s most perennial objects of investigation: *Clarissa Harlowe*. Bringing the mode of inquiry Hooke describes—named by Boyle the “mechanical philosophy”—into conversation with Richardson’s text, I explore how *Clarissa*’s interiority is conceptualized by her libertine pursuer and her sentimental author in a manner that is fundamentally technological. Beginning with Lovelace’s real and imagined incursions into *Clarissa*’s secret recesses, and moving to explore how the rake’s perceptual mode is both repudiated and replicated by Richardson himself, this chapter examines how mechanistic understandings of the natural world are implicated in *Clarissa*’s representations of *Clarissa*’s body and subjectivity, and in the ways it was (and is) possible to understand them. I further consider how the technologies that produced

² Hooke, *Micrographia*, viii.

and deciphered these obscure interiors are important to how gender difference is fashioned in Richardson's text, and in its wider eighteenth-century context.

Parts which custom permits to be visible

As Clarissa Harlowe lies dying amidst the final pages of the text that bears her name, after her doctor has pronounced that the best hope in her case is that she "might yet live two or three days," Lovelace rages that "this hard-hearted and death-pronouncing doctor" deserves

the *utmost* contempt for suffering this charming clock to run down so low. What must be his art, if it could not wind it up in a quarter of the time he has attended her, when at his first visits the springs and wheels of life and motion were so good that they seemed only to want common care and oiling!³

The clock metaphor Lovelace employs during Clarissa's final decline mirrors Hooke's logic in the *Micrographia* by imagining the dying woman as an object "manag'd by Wheels, and Engines, and Springs." In doing so, Lovelace's metaphor illuminates the links between his own methods of perception and understanding and the mechanistic understandings of the natural world promulgated in the seventeenth century.

As Hooke's account suggests, clocks and clockwork mechanisms were among the mechanical philosophy's most potent conceptual tools. Clocks themselves—newly accurate, accessible, and ubiquitous—proliferated in domestic and public spaces during the mid-seventeenth century.⁴ They likewise appeared in rapidly increasing numbers as

³ Samuel Richardson, *Clarissa, or, The History of a Young Lady*, ed. Angus Ross (London: Penguin, 2004), 1341-44. References are to this edition.

⁴ Shapin posits that the clock's persistent recurrence in philosophical works is rooted in the fact that the "regulatory functions" of clockwork technology were, by the seventeenth century, "important aspects of daily experience," and therefore offered "a uniquely intelligible and proper metaphor for explaining natural

metaphorical objects and conceptual aids in natural philosophical texts.⁵ As discussed in the last chapter, across the latter half of the seventeenth century, institutions such as the Royal Society (and individuals beyond them) pursued what we now name the “new science”; as they did, they participated in and produced a number of interrelated changes in what it was possible to know about the natural world and, importantly, “the practices by which legitimate knowledge was to be secured, assessed, and communicated.”⁶

Significantly, beginning in the seventeenth century, the Aristotelian model of physics that had prevailed for centuries—in which different paradigms existed for earth and the cosmos, as well as for natural and artificial forms—was slowly superseded by an understanding of physics as a unified and comprehensive theory through which the same principles could explain the properties of all matter, regardless of its particular form. Because of this, natural philosophy now allowed for the extrapolation of knowledge from experimentation, based on the equivalency of effects across situations and scales: a possibility most famously codified in Newton’s description of the three laws of motion in the *Principia* of 1687. This equivalency of effects meant that technological experimentalism could describe not only the direct objects of its inquiry (what Cavendish might term “exterior parts and superficies”) but could apprehend the “obscure actions” that lay beneath or behind. Frequently, this apprehension was itself expressed in

processes.” See Shapin, *The Scientific Revolution* (Chicago: University of Chicago Press, 1996), 33. The technological advances made in clockwork mechanisms will be discussed in more detail in the following section.

⁵ Otto Mayr tracks the frequency of clockwork metaphors across early modern Europe, noting that they were uncommon through the sixteenth century before exploding in number in the seventeenth, particularly in new scientific texts. See Mayr, *Authority, Liberty, and Automatic Machinery in Early Modern Europe* (Baltimore: Johns Hopkins University Press, 1986), especially chapters two and three.

⁶ Shapin, *The Scientific Revolution*, 5.

technological terms, describing nature itself as “explicitly modeled...on the characteristics of a machine.”⁷ By imagining a mechanical universe, natural philosophers conceptualized nature as a system able to be apprehended (in fact, as a system that mirrored the technological objects newly important to the process of apprehension itself). A nature figured as mechanical was one characterized by operations that were unified, regular, and observable: these operations therefore promised to be intelligible to the right witness. We can see this clearly in the passage from the *Micrographia* I quoted earlier in the chapter, which uses imagery of wheels, springs, and engines to articulate Hooke’s hope about the accessibility of natural knowledge that remained mysterious in the Aristotelian paradigm. The “mechanical philosophers” of the seventeenth and eighteenth centuries used this conceptual mode to explore and expose nature’s secret workings for themselves and their readers.⁸ The most frequently used mechanical reference in these texts was, by a significant margin, the clock. Descartes, for example, extrapolated natural functions from the movement of a clock, writing that:

mechanics is a division or special case of physics, and all the explanations belonging to the former also belong to the latter; so it is not less natural for a clock, made of the requisite number of wheels, to indicate the hours, than for a tree which has sprung from this or that seed, to produce a particular fruit.⁹

⁷ Shapin, *The Scientific Revolution*, 30.

⁸ Though used by practitioners such as Robert Boyle, the terms “mechanical philosophy” and “mechanical philosophers” are in some senses anachronistically categorical, collecting a group of diverse and often disparate thinkers ranging from Descartes to Boyle to Hobbes to la Mettrie. In this chapter, I use the term “mechanical philosophy” not to designate a (nonexistent) grand theory of mechanism, but instead as a kind of shorthand to signify a number of divergent but interrelated theories that conceived of the natural world as a system regulated by mechanical principles.

⁹ Descartes, “Principles of Philosophy,” in *Selected Philosophical Writings*, ed. John Cottingham, Robert Stoothoff, and Dugald Murdoch (Cambridge: Cambridge University Press, 1988), 209.

Robert Boyle likewise asserted that “the whole Universe (the Soul of Man excepted)”¹⁰ was

but a great *Automaton*, or self-moving Engine, wherein all things are performed by the bare motion (or rest), the size, the shape, and the scituation [*sic*] or texture of the parts of the Universal Matter it consists of; all the *Phaenomena* result from those few Principles, single or combin’d...So that the World being but, as it were, a great piece of Clock-work, the Naturalist as such, is but a Mechanitian; however the parts of the Engine he considers, be some of them much larger, and others much minuter, than those of Clocks or Watches.¹¹

In works such as these, the clock became the preferred symbol for the way in which new theories of natural philosophy promised to make the obscure perceptible.

This newly mechanized vision of the “whole Universe” encompassed a radical shift in how embodiment was understood. Sawday explains that during the sixteenth century, as it began to be explored more in more detail, the body was commonly represented as “a remote and strange terrain into which the discoverer voyaged.”¹² In the seventeenth century, Sawday finds, this geographical metaphor was replaced by a mechanical one. And, as with technological perceptions of the natural world more generally, this mechanized vision of the human body promised to open it for its witness,

¹⁰ Boyle’s parenthetical exception is an important one, and gestures to one of the most contentious aspects of the mechanical philosophy: the way in which its logic was associated with materialism and atheism. As Muri notes, when followed to “its most outrageous extreme,” the mechanical philosophy “ultimately suggested that the soul or spirit was nothing more than an elaborate fiction” (62). This extreme was notoriously propounded in Julien Offray de la Mettrie’s *L’homme machine* of 1748, which argued that “since all the faculties of the soul depend so much upon the proper organization of the brain, and of the whole body...they appear evidently to be nothing but this organization itself” and that the soul was thus “nothing but an empty term” (*Man a machine*, 2nd ed. [London: G. Smith, 1750], 54-55, ECCO [CW3320526673]). Yet, though the specter of godlessness did haunt mechanism, the deliberately provocative La Mettrie was an outlier. Like Boyle, most mechanical philosophers were careful to indicate that their theories did not encompass the human soul.

¹¹ Boyle, *The excellency of theology compar’d with natural philosophy* (London: Henry Herringman, 1674), 169-170. EEBO.

¹² Sawday, *The Body Emblazoned*, 24.

who “no longer stood before the body as though it was a mysterious continent.” Instead, the body had become “a system, a design, a mechanically organized structure, whose rules of operation, though still complex, could, with the aid of reason, be comprehended in the most minute detail.”¹³ The body was, as Sawday’s work demonstrates, one of the primary sites upon which mechanical natural philosophy worked to provide access to a formerly inaccessible interior truth. This intellectual project used mechanism to express at once the body’s functions and its openness before the natural philosopher; so Thomas Willis could ask in 1681, “for what end are the motive organs framed with wonderful artifice and manifold difference, unless that after the manner of Machines, they might perform their operations by an orderly structure, and....mechanical provision of parts?,” and insist that “it will be no hard thing to apply the exercises of a Muscle and of the whole nervous Function, and to explicate them according to the Rules, Canons, and Laws of a Mechanick.”¹⁴ As Willis’s reflections intimate, the idea of a mechanically structured interior offered the alluring possibility of a body that could be made to speak all of its secrets—a body in which these secrets were replaced by workings of absolute transparency. And, as in mechanistic theories more generally, these theories habitually invoked the image of clockwork. Descartes himself wrote that

the difference between the body of a living and that of a dead man is just like the difference between, on the one hand, a watch or other automaton (that is, a self-moving machine) when it is wound up and contains in itself the corporeal principle of the movements for which it is designed...and, on the other hand, the

¹³ Sawday, *The Body Emblazoned*, 31.

¹⁴ Thomas Willis, *Five Treatises, viz. 1. Of urines, 2. Of the accension of the blood, 3. Of muscular motion, 4. The anatomy of the brain, 5. The description and use of the nerves* (London: T. Dring et al, 1681), 35, EEBO.

same watch or machine when it is broken and the principle of its movement ceases to be active.¹⁵

Echoing Descartes' association of clockwork's "principle of movements" and the motions of life, John Browne begins his account of the nature of muscular function in the *Myographia nova* of 1705 by writing that "Having...survey'd the *Frame of the Humane Body*, it is required to examine the *Springs* that set the Machine going: for it is as necessary to observe the *Mechanism* with which a *Watch* moves, as it is to know the Excellency of the Workmanship" (iv). In his own explanation of the muscular system in the third treatise of *Five Treatises*, Willis avows that

as in mechanical things, when any one would observe the motions of a Clock or Engine, he takes the Machine itself to pieces to consider the singular artifice, and doth not doubt but he will learn the causes and properties of the PhaenomenonIn like manner, when it is brought before your eyes to behold and consider, the structure and parts of a Muscle, the conformations of the moving fibres, their gesticulations and alterations while they are in motion, why is it that we should despair to extricate the means and reasons of the motive function, either by truths or next to truth? (39)

Willis's description of a deconstructed clock invokes what Otto Mayr identifies as a key aspect of the metaphor in mechanical philosophical texts, in which the very "method of uncovering the secrets of nature was that of the clockmaker": that is, "to find out how an unfamiliar clock worked or why a broken clock did not, the clockmaker would take it apart" (39). Mayr argues that in these texts "The taking apart of a clock thus became an illustration of that process known as *analysis*" (39), and therefore represented one of the principal endeavours of the new natural philosophers. These images of a clock in pieces

¹⁵ Rene Descartes, "The Passions of the Soul," in *Selected Philosophical Writings*, ed. John Cottingham, Robert Stoothoff, and Dugald Murdoch (Cambridge: Cambridge University Press, 1988), 220.

likewise remind us that the clockwork body was not simply open before the natural philosopher, but needed to be, both metaphorically and literally, opened by him.

In this context, Lovelace's comparison of Clarissa to a "charming clock" indicates his participation in new scientific (and specifically mechanistic) methods of inquiry and understanding—an association that is not so surprising when we consider his declaration to Belford that "I love, thou knowest, to trace human nature, and more particularly female nature, through its most secret recesses" (843). Lovelace's desire to enter Clarissa's secret recesses is, in fact, the driving force of Richardson's novel. As the narrative unfolds, it becomes clear that Lovelace's preoccupations with testing Clarissa's virtue, ascertaining the nature of her feelings for him, and raping her are all manifestations of a longing to render what is inside of her—and therefore just out of view and understanding—at once palpable, quantifiable, and subject to his mastery. Describing Clarissa's body as a clock, Lovelace therefore conjures a fantasy in which the "springs and wheels of life and motion" are laid bare before him, available for his scrutiny as well as any "care and oiling" he deems necessary. His metaphor transmutes Clarissa's body—which, as it fails, bespeaks his own failure to master it—into an object that promises to reveal its mysteries to anyone who wishes to "observe the *Mechanism*": into the very object that was supposed to signify the triumph of rational analysis and the "certainty of empirical knowledge" (Mayr 85). By making the mechanical philosopher's clockwork vision of the body explicitly violent and erotic, Lovelace's fantasy suggests that these qualities are latent in the perceptual mode he adopts. Further, by metaphorically linking the image of a deconstructed clock with a *woman's* body, Lovelace demonstrates the easy

slippage between the two, and the ways in which this epistemological project—particularly in its movement to objectify and “open,” or discover—has a gendered logic. His clockwork vision is linked with the increasing tendency in the eighteenth century to imagine women as “possessing a hidden ‘Secret’ that turns them into objects of a curious search” in what Benedict has identified as a disciplinary impulse to transform women, who increasingly “encroach[ed] on the masculine arenas of politics, literature, and consumption” “from “inquirers into objects of inquiry.”¹⁶ In the context of Lovelace’s clock metaphor and its root in the mechanical philosophy, we can extend these observations further: by dividing the philosopher/rake and the object of his desire into apprehending subject and decipherable machine, this gaze produces a binary system of gender difference premised in the literal and conceptual technologies that make apprehension possible.

These implications of the clock metaphor become more apparent when we consider a pair of passages from Lovelace’s letters that bookend his attempted conquest of Clarissa, and similarly thematize his fascination with accessing her interior. The first is drawn from the letter he sends Belford after he has successfully abducted Clarissa from the garden at Harlowe Place. He offers Belford a description of his love “as at the moment she appeared to me...and as, upon a nearer observation, she really was” (399):

Her wax-like flesh (for, after all, flesh and blood I think she is!) by its delicacy and firmness, answers for the soundness of her health. Thou hast often heard me launch out in praise of her complexion. I never in my life beheld a skin so *illustriously* fair. The lily and the driven snow it is nonsense to talk of: her lawn and her laces one might, indeed, compare to those; but what a whited wall would a woman appear to be, who had a complexion which would justify such unnatural

¹⁶ Benedict, 119.

comparisons? But this lady is all alive, all glowing, all charming flesh and blood, yet so clear, that every meandering vein is to be seen in all the lovely parts of her which custom permits to be visible. (399)

At the conclusion of Lovelace's rhapsody on Clarissa's skin, he marks its most erotic quality as its transparency. While the whiteness of her flesh is extraordinary, what makes it so attractive is not simply its fashionable paleness but the way in which that pallor allows for a tantalizing glimpse of what lies beneath her skin. Lovelace's lustful reference to the parts of Clarissa which "custom permits to be visible" glances not only at body parts covered by her clothing, but at those covered by the flesh which is, in fact, "so clear" that it partially reveals what it is meant to contain. A few paragraphs later, Lovelace reprises this theme when he describes how "A white handkerchief... concealed—Oh Belford! what still more inimitable beauties did it not conceal!—And I saw, all the way we rode, the bounding heart; by its throbbing motions I saw it! dancing beneath the charming umbrage" (400). Again the erotic charge associated with the interplay between clothing and skin is transferred to that between skin and interior, as Lovelace's libidinous gaze sees not only beyond Clarissa's handkerchief but also, imaginatively, through the skin it covers to view the movements of her heart. These selections from Lovelace's first physical description of Clarissa anticipate the clock metaphor he employs to describe her near the end of the book by fantasizing that Clarissa's inner workings are available to be seen and understood.



Figure 5: Front of a typical bracket clock, made in London by Thomas Tompion (1690), currently held at the Victoria & Albert Museum, item number M.214-1924. Image via <http://collections.vam.ac.uk/item/O78486/bracket-clock-tompion-thomas/>.



Figure 6: Back of Tompion's 1690 bracket clock. In this image the back of the clock has been opened, but the metal back-plate still shields most of the inner mechanisms. Image via <http://collections.vam.ac.uk/item/O78486/bracket-clock-tompion-thomas/>.

Significantly, however, Lovelace's account here focuses not just on transparency, but also on opacity: he dwells on the movement (made possible by his objectifying vision) from concealment to discovery, from outside to interior. Clocks and watches, though their ordered workings promised and signified a transparency of apprehension, were not themselves transparent: the vogue for glass clocks in which the mechanism was revealed postdates Richardson's own work by several decades. Instead, after it became obvious that "mechanisms exposed to dust and damp wore out quickly and very often went wrong," clockmakers enclosed these mechanisms in opaque boxes or cases.¹⁷ Clocks and watches therefore needed to be opened in order to view their function, and there were often multiple layers of barriers that lay between the mechanism and its would-be witness (see figs. 5 and 6). As Mayr suggests with his observation that the "taking apart of a clock," rather than the image of the clock itself, became the defining conceptual framework for mechanical philosophers, the opaque qualities of clocks and watches indicate how the philosopher's apprehensions were premised on his movement past an exterior boundary to view the secret workings beneath. Lovelace's easy translation of the philosopher's technological vision into a desiring gaze ranging underneath a woman's clothes and skin to decipher (and thus master) her obscurities

¹⁷ Samuel Guye and Henri Michel, *Time and Space: Measuring Instruments from the 15th to the 19th Century*, trans. Diana Dolan (New York: Praeger, 1971), 36.

suggests how this mode of perception is both embedded in and productive of structures of gender difference and gendered embodiment.

A pair of engravings made in 1730 by Augsburg artist and bookseller Martin Engelbrecht helps us to understand the desires served by looking at—and then into—a clock. The engravings come from a lavish book of over 150 colour engravings Engelbrecht produced, entitled *Neu-eröffnete Sammlung der mit ihren eigenen Arbeiten und Werkzeugen eingekleideten Künstlern, Handwerkern und Professionen*, or, roughly, “a new collection of artists and craftsmen, clothed in their own work and tools.” As the title suggests, Engelbrecht’s collection is a tongue-in-cheek catalogue of professions in which skilled labourers appear adorned with the products they make and the implements with which they make them: a luthier wearing stringed instruments and woodworking tools, a confectioner bedecked with sweets and candy moulds, and so on. The relevant engravings represent a clockmaker and his wife, in the same male-female pairing that characterizes all of the book’s representations. The clockmaker (“l’Horloger/Uhrmacher,” fig. 7), as with the rest of the professions’ male representatives, comes first: he is shown wearing a clock on his head, adorned with and surrounded by a number of other clock components and clockmaking instruments, and flanked by two completed clocks. The engraving’s representation of its subject is typical of Engelbrecht’s collection in its use of his tools and products as a collection of ornamental accessories. The engraving of the clockmaker’s female counterpart (“l’Horlogere/Uhrmacherin,” fig. 8) on the next page, however, is *not* typical. Uniquely among the many engravings in the collection, “l’Horlogere” makes person and object practically indistinguishable: instead of being



Figure 7: "l'Horloger/Ein Uhrmacher," in Engelbrecht's *Sammlung* (Augsburg, 1730), 77, via the Münchener DigitalisierungsZentrum Digitale Bibliothek, http://daten.digital-sammlungen.de/bsb00068177/image_153.

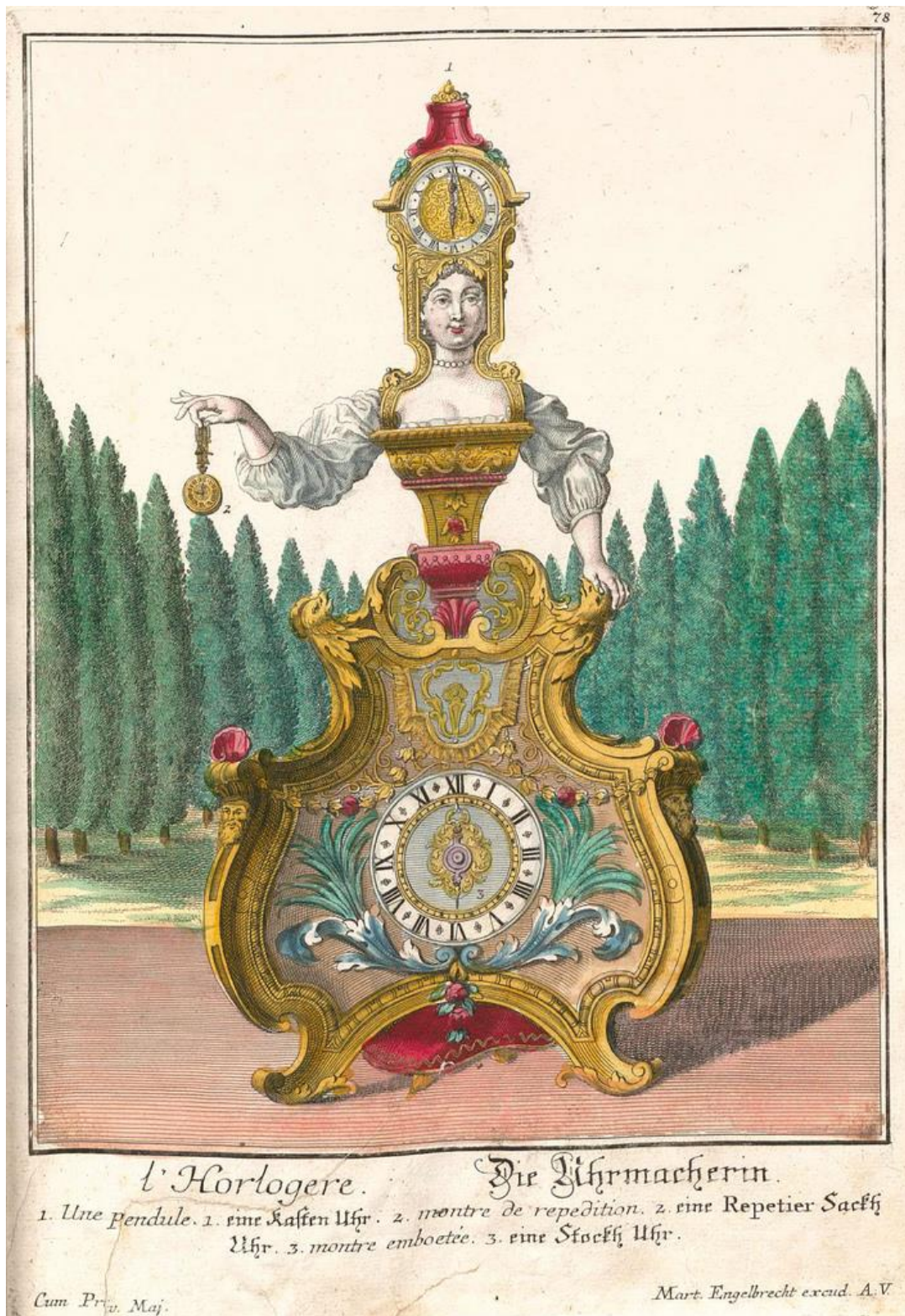


Figure 8: "l'Horlogere/Die Uhrmacherin," in Engelbrecht's *Sammlung* (Augsburg, 1730), 78, via the Münchener DigitalisierungsZentrum Digitale Bibliothek, http://daten.digital-e-sammlungen.de/bsb00068177/image_155.

spruced by a number of accessory-objects, l’Horlogere’s body is subsumed by a clock. Her face is surrounded by a wrought-metal frame and mirrored by a clock-face above, her right hand holds a watch that hangs like a pendulum, and her left hand rests on her clock-body; all other parts (save her décolletage and two tiny feet) are clock-parts.¹⁸ The way l’Horlogere’s clock-body signifies is ambiguous. Cinching at the waist and exploding into decorative detail below, the clock components seem to resemble clothing, but is what is beneath a woman’s body or a mechanical system? Is there any distinction between the two? We should also note that another clock face is positioned below her waist, or in the middle of the lower clock’s body. Especially when viewed alongside her male counterpart, provided as he is with the instruments to make or repair a clock, this representation of l’Horlogere is sexually suggestive, implying that she is an object upon which the clockmaker’s mechanical skill is exercised: a process that would here take place beneath her “skirts”. With the clear distinction between l’Horloger (equipped with tools, and both visually and practically dominating the smaller objects upon which these tools are exercised) and l’Horlogere (who is indistinguishable from the passive clock-object) Engelbrecht’s paired engravings further demonstrate how the mode of perception and understanding articulated by mechanical philosophers and extended by Richardson’s rake are both premised on and productive of a gendered binary. Recalling Lovelace’s lascivious description of Clarissa, the boundaries of l’Horlogere’s objectified body

¹⁸ These details remind us that the visible parts of a clothed woman’s body echo the visible parts of a clock’s mechanism: the face and hands. The exposed parts of l’Horlogere’s body likewise mirror the parts of Clarissa that Lovelace obsesses over in his rhapsodic description.

seemingly exist so that her viewer (identified with the male clockmaker) is able to imagine penetrating them, discovering once and for all what exactly lies beneath. Engelbrecht's engraving illustrates the particular epistemology (and erotics) of the clock, in which the process of revelation is made possible and pleasurable not simply by the mechanism's transparency of function, but, more specifically, by the mechanic/philosopher's movement past opaque boundaries to apprehend the secret workings beneath. By both explicitly and implicitly calling on the same conceptual framework in his descriptions of Clarissa, Lovelace reveals how this mechanical logic informs his desire to "fondle, probe, dismantle, and take possession of"¹⁹ her. Like Engelbrecht's engravings, Lovelace's descriptions link the movement from concealment to exposure to mastery with an explicitly sexualized gaze, suggesting that the mechanical philosopher's objectifying perception is always already driven by an erotic force.²⁰

Lovelace's fascination with his love's inner workings achieves its most macabre expression after their motion has ceased. After Belford informs him of Clarissa's death, Lovelace writes an odd letter to his confidant, of which he later remembers little (1428), and that begins with his avowal that "I think it absolutely right that my ever-dear and

¹⁹ Park, 65.

²⁰ In this sense, my reading of *Clarissa's* clockwork imagery complements and extends the classic deconstructionist arguments of, for example, Terry Castle in *Clarissa's Ciphers* (Ithaca: Cornell University Press, 1982), where she observes that Richardson's novel shows how "interpretation itself" can become "an act of 'penetration'—an act of filling the gap left by the (incomplete) sign, an act of violence" (59). William Beatty Warner similarly links interpretation and sexual violence when he argues that "[t]he rape is...to be seen as a moment of knowing—the moment when Clarissa will be undressed, seen, penetrated, and known. These are the activities which engage every reader, like Lovelace, who wishes to win authority for his interpretation"; see *Reading Clarissa: The Struggles of Interpretation* (New Haven: Yale University Press, 1979), 50. Warner himself evokes the same imagery of fabric, skin, and seductively concealed interior as Lovelace when he invokes Clarissa's frustrating "mantle of integrity" and suggests that "we are left reading the folds of Clarissa's text, the only garment she has left us," in order to try to discern what lies beneath (27).

beloved lady should be opened and embalmed” (1383). Continuing to insist on the performance of this procedure, Lovelace directs that afterwards Clarissa’s body should be “laid in my family vault between my own father and mother,” but that

her heart, to which I have such unquestionable pretensions, in which I once had so large a share, and which I will prize above my own, I *will* have. I will keep it in spirits. It shall never be out of my sight. (1384)

Later in the letter, he repeats, “I will have possession of her dear heart this very night; and let Tomkins provide a proper receptacle and spirits, till I can get a golden one made for it” (1384). Written only three days after the letter in which he compares Clarissa to a clock, Lovelace’s insistence on exposing her interior is not, as Mowbray suggests to Belford, evidence of “what a *queer* way he is in” amidst his grief over Clarissa’s death (1382). While Lovelace may be, as an editorial comment by Richardson implies, “delirious” while he writes the letter, his fixation on cutting Clarissa open is actually a logical continuation of the clock metaphor he employs during her illness, as well as the modes of perception and understanding which that metaphor signals, and which, as I have argued, Lovelace applies to Clarissa from the beginning of his attempted seduction. Particularly telling is Lovelace’s declaration that once it has been removed from her body, Clarissa’s heart “will never be out of my sight,” a claim that references his earlier excitement at discerning her heart’s movements, but converts the eroticism of the prior passage into a gruesome spectacle of the interior made visible. The image of the deconstructed clock is here bound to one of the dissected specimen suspended in spirits. Both images denote forms of autopsy, a term which, during the eighteenth century, did not yet signify the operation Lovelace wishes to be performed on Clarissa’s body, but

instead meant the “action or process of seeing with one’s own eyes; personal observation, inspection, or experience,”²¹ or, as Johnson put it, “ocular demonstration.”²² Lovelace’s fevered obsession with “opening” Clarissa bespeaks the centrality of “ocular demonstration” to eighteenth-century theories of the body, and in particular the compulsion to “take the machine...to pieces” which drove Willis, along with others influenced by the mechanical philosophy. Describing this process of deconstruction in increasingly literal ways, Lovelace’s letters to Belford capture the libidinal thrill of penetrating the body’s secret workings, as well as the violence that such investigations necessarily meted out on the subjects—turned objects—of their inquiry.²³

The violence of ocular demonstration was necessary to scientific investigation of the body, and was acknowledged as such in works like William Harvey’s groundbreaking *Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus* of 1628, the first text to accurately describe the motions of the heart and circulatory system. In it, Harvey explains that the vivisection of animals such as doves, chickens, dogs, and swine was

²¹ *Oxford English Dictionary Online*, s.v. “autopsy, n.,” last modified December 2013, <http://www.oed.com/view/Entry/13519>.

²² Johnson, *A dictionary of the English language*, Vol 1 (London: J. Knapton et al, 1756), s.v. “autopsy,” ECCO (CW111104919). The *OED* dates the first definitive use of the term to denote a “post-mortem examination” to 1805, though there are hints of it being used as such earlier.

²³ Lovelace’s desire to possess Clarissa’s corpse likewise links him to one of the eighteenth century’s most execrated figures: the bodysnatcher who supplied the anatomist with materials. Ruth Richardson notes that by the 1720s, “the stealing of bodies from London graveyards was almost a commonplace.” See *Death, Dissection, and the Destitute* (Chicago: University of Chicago Press, 2000), 55. Though Lovelace’s interest in Clarissa’s body is not of the entrepreneurial kind, his radical objectification of her interior anatomy mirrors the bodysnatcher’s commodification of dead bodies.

what enabled his new understanding of the heart's functions²⁴; while describing the rhythmic motion of the heart, for example, he writes that

the *hearts* of all creatures, being dissected whilst they are yet alive, opening the *breast*, and cutting up the *capsule*, which immediately environeth the *heart*, you may observe that the *heart* moves sometimes, sometimes rests: and that there is a time when it moves, and when it moves not.²⁵

He later describes what he has learned from grasping still-living animals' hearts in his hand as their motion slowly ceased, an account that expresses how such investigations opened up both bodies and strangely intimate forms of knowledge.²⁶ Harvey's work, which literalized the conceptual framework of deconstruction that would become central to the mechanical philosophy, was similarly implicated in structures of gender difference and desire. This is particularly evident when we consider how Harvey's work of opening the obscure to apprehension and mastery was characterized, in a poem written by Abraham Cowley, as an act of sexual violence. In "Ode. Upon Dr. HARVEY," Harvey is represented by Cowley as a new Apollo, in pursuit of "Coy nature," who thus far had "remain'd, though aged grown, / A beauteous Virgin still, enjoy'd by none, / Nor seen unveil'd by any one."²⁷ Fearing "Harvey's violent passion," Nature vainly "Took sanctuary, like Daphne, in a tree," at which point Harvey outdoes the gods:

²⁴ Harvey, *The anatomical exercises of Dr. William Harvey, professor of physick, and physician to King Charles the first, concerning the motion of the heart and blood* (London: Lowndes and Gilliflowe, 1673), 18-28, EEBO.

²⁵ Harvey, *Anatomical Exercises*, 17. This passage is taken from an English translation of Harvey's text; the fact that a translation was produced signals the interest that research such as Harvey's held for those outside of the learned circles to which the text, originally written in Latin, was at first directed.

²⁶ Harvey, *Anatomical Exercises*, 18. This intimacy could be affective as well as physical: Harvey would go on to dissect, post-mortem, the bodies of both his sister and his father. See Richardson, *Death, Dissection, and the Destitute*, 31.

²⁷ Cowley, "Ode. Upon Dr. HARVEY," in *Select Works of Mr. A. Cowley, dramatic and poetical* (London: T. Sherlock, 1777), 3:277, ECCO (CW3317235242). References are to page numbers in this edition.

There Daphne's lover stopt, and thought it much
The very leaves of her to touch:
But Harvey, our Apollo, stopp'd not so,
Into the bark, and root, he after her did go:
No smallest fibres of a plan,
For which the eye-beam's point doth sharpness want,
His passage after her withstood... (277-278)

As the poem continues, Harvey's penetration of "Nature" remains simultaneously visual, sexual, and intellectual, as she vainly attempts to take "refuge in the heart":

"Here sure shall I be safe (said she)
None will be able sure to see
This my retreat, but only he
Who made both it and me.
The heart of man, what art can e'er reveal?[""]
[...]
She spoke, but ere she was aware,
Harvey was with her there,
And held this slippery Proteus in a chain,
'Till all her mighty mysteries he descried,
Which from his wit th'attempt before to hide,
Was the first thing that Nature did in vain. (278)

Will Pritchard euphemistically describes Cowley's ode as a work that "recasts Harvey's scientific accomplishment as a forcible triumph over an unwilling and formerly unknowable female," in which knowledge of "nature's 'mighty Mysteries' is equated to carnal knowledge of a woman"²⁸; Jonathan Sawday is more blunt, recognizing that Cowley "unambiguous[ly]" represents Harvey as a "rapist."²⁹ Cowley's poem shows us that Lovelace's sexualized desire to access, excise, and claim Clarissa's heart—to never

²⁸ Pritchard, 65-66.

²⁹ Sawday, *The Body Emblazoned*, 240.

have it out of his sight—does not pervert the desires of the philosophers who deconstructed the human body, but simply reprises them.³⁰

The brutal processes of corporeal analysis described by Harvey and allegorized by Cowley were not performed solely in the natural philosopher's workshop, however, or in the texts that reported what knowledge was gained there, as accounts of an enduring London attraction indicate. In 1732, the French surgeon Abraham Chovet, who specialized in “contriving *anatomical preparations* in wax,” wrote that he was working to construct “a body in wax...wherein the action of the heart and lungs, and the circulation of the blood, will be made visible.”³¹ By 1737 Chovet's labour was complete, and the wax figure was on display, along with “several other curious anatomical preparations,” at Rackstrow's Museum in Fleet Street, London.³² The automaton does not survive, nor does a visual representation of it.³³ A pamphlet designed to accompany the exhibition of the figure, however, provides a detailed description of its appearance and function:

³⁰ My analysis here builds on the classic arguments of Carolyn Merchant, who argues in *The Death of Nature: Women, Ecology, and the Scientific Revolution* (San Francisco: Harper and Row, 1982) that “For Bacon, as for Harvey, sexual politics helped structure the nature of the empirical method that would produce a new form of knowledge and a new ideology of objectivity seemingly devoid of cultural and political assumptions” (172); and Sandra Harding, who writes in *The Science Question in Feminism* (Ithaca: Cornell University Press, 1986) that during the early modern period “the best scientific activity and philosophic thinking about science [were] modeled on men's most misogynous relationships with women” (112).

³¹ Abraham Chovet, *A syllabus, or index, of all the parts that enter the composition of the human body: in twelve lectures* (London, 1732), 4, ECCO (CW108585266).

³² *An Explanation of the Figure of Anatomy, wherein the Circulation of the Blood is made visible thro' Glass Veins and Arteries* (London, 1747), 1, ECCO (CW107556715). References are to this edition. There is a vivid array of critical work on Rackstrow's museum, much of it dealing with questions of the establishment's purpose and value. Matthew Craske's recent article provides a useful summary of scholarly resources related to the Rackstrow's, while offering a nuanced reading of the museum's functions and meanings across the eighteenth century: see Craske, “‘Unwholesome’ and ‘pornographic’: a reassessment of the place of Rackstrow's Museum in the story of eighteenth-century anatomical collection and exhibition,” *Journal of the History of Collections* 23, no. 1 (2011), doi: 10.1093/jhc/fhq018.

³³ The pamphlet accompanying the exhibition (quoted below) includes an illustration of the figure's heart. See fig. 9 on page 146, at the end of this chapter.

THIS figure represents a Woman gone eight Months with Child, chained down upon a Table, supposed to be open'd alive, of which the two principle cavities are laid open, viz. the Breast and the lower Belly, which are divided from each other by the Diaphragm or Midriff. In the Breast, the Heart which is placed to move for carrying on the Circulation is seen between the two Lobes of the Lungs, which likewise move as in Breathing; from the Heart are seen going out the two principal Arteries of the Body made of Glass; the one leading to the Lungs, and the other towards every Part of the Body...Through the Arteries a red Liquor, in imitation of Blood, is seen to move from the Heart to every Part of the Body, and by the Veins returning from every Part of the Body to the Heart again. (3-4)

The pamphlet goes on to explain that the “Child” is likewise visible “in the Womb,” and that the figure is designed to represent the passage of blood and “Nourishment” from the Mother’s body to the child’s (4).³⁴ This figure was presented, as the pamphlet explains, in order that “any Person, tho’ unskilled in the Knowledge of Anatomy, may at one view be acquainted with the Circulation of the Blood, and in what Manner it is performed in our living Bodies” (1).

This remarkable automaton, which remained on display at Rackstrow’s for over 60 years (until the museum was closed and its collection sold off in 1799),³⁵ translated the practices of bodily investigation described in scientific treatises into a widely accessible public spectacle. The impetus behind the figure, as both Chovet and the informational pamphlet describe, was the process of making the interior visible, such that any observer, no matter how ignorant of physiological theory, would be able to decipher

³⁴ Craske notes that the original structure of the automaton reflected the fact that in the early eighteenth century, anatomists had a limited understanding of the “fluid dynamics of pregnancy.” In fact, the interior of Chovet’s figure was “entirely reworked” late in the eighteenth century to incorporate the advancements made in this area by William Hunter’s 1774 *Anatomy of the Human Gravid Uterus Exhibited in Figures* (88).

³⁵ See Craske, “‘Unwholesome’ and ‘Pornographic,’” 77.

the complex functions of the circulatory system “at one view.”³⁶ Like the instruments that Royal Society members used to produce artificially verified matters of fact, the automaton at Rackstrow’s uses technology as an “objectifying resource” to produce empirical truths.³⁷ The automaton—like Engelbrecht’s engraving of l’Horlogere’s clock-body and Lovelace’s fantasies of Clarissa—demonstrates how this process relied upon the female body, figuring it as a passively objectified mechanical system available for the witness’s deciphering gaze. Spectators of the wax automaton at Rackstrow’s, taking on this gaze, are invited to view the procedure of vivisection as suspended in an eternal moment of discovery, freed from noisome fluids and the inevitability of death, but not from the violence that makes this vision possible. Indeed, prior to its explanation of the figure’s workings, the descriptive pamphlet includes an “Animadversion” which maintains that “it was absolutely necessary” that the automaton “should represent a Woman, supposed to be opened when alive,” because the processes it reveals are “all vital Functions, which are not exercised in a Body when dead”; therefore, “it is to be hoped that nobody will make objection to this Representation, which would carry with it an Idea of the highest Barbarity and Cruelty, had it ever been put in Practice upon any Humane Body” (2). Like the “Coy Nature” of Cowley’s ode, this “slippery Proteus” must be chained and penetrated to be opened before her viewer, demonstrating once again that this mode of perception was unimaginable without the edge of a knife, as harrowing as its

³⁶ In its combination of human anatomy, mechanism, and spectacle, the automaton calls on the dual contexts of anatomy theatres and the “machine books” that “announced themselves as ‘theatres’ of machinery” in which “mechanisms were disassembled, to show the reader how these devices were constructed...their mysterious mechanical interiors...dissected, enumerated, categorized, and opened to the public gaze.” See Sawday, *The Body Emblazoned*, 108-109.

³⁷ Shapin and Schaffer, 77

effects were acknowledged to be. The “necessary... Woman” at the center of this scene of discovery is created both for and by it.

Clarissa as Lovelace sees her, with her wax-like flesh and visible mechanisms, bears an uncanny resemblance to the anatomized woman who fascinated London crowds through the waning years of the eighteenth century. Of course, we cannot know if Richardson ever encountered or even knew of Chovet’s automaton, though the author’s long residence in the Salisbury Court area—mere minutes from Rackstrow’s Fleet Street establishment—makes speculation tempting.³⁸ Whether or not Richardson was familiar with Rackstrow’s museum is, however, ultimately irrelevant; either way, Chovet’s dissected figure and *Clarissa*’s representations of Lovelace’s rapacious gaze participate in the changes that recent scientific work had wrought upon ways of seeing and knowing.³⁹ Chovet’s automaton materialized the theories of natural philosophers who reimagined the human body as a clockwork mechanism—as a complex but fundamentally intelligible system that promised to reveal its workings to those who analyzed its disassembled components. Like the automaton, Lovelace’s descriptions of Clarissa envision a body in which an inaccessible and mysterious interiority is seductively

³⁸ See William M. Sale, *Samuel Richardson, Master Printer* (Ithaca: Cornell University Press, 1950), 8-14, which shows that Richardson moved to the area around 1719 and remained until the mid-1750s.

³⁹ As Helen Thompson (citing Sale’s study) notes, Richardson’s own awareness of such scientific innovations was a function of his work as a printer. “The fact that Richardson printed the [Royal Society’s *Philosophical*] *Transactions*, contemporary texts on medicine and chemistry, and Jonathan Swift’s *Gulliver’s Travels* (1727),” she writes, “ensures his familiarity with post-Boylean treatments of material reality and its human apprehension” (200-201); his familiarity with theories, procedures and outcomes of the vivisection of animals and dissection of human bodies—common topics in the *Transactions*—is likewise certain. See “Secondary Qualities and Masculine Form in *Clarissa* and *Sir Charles Grandison*,” *Eighteenth-Century Fiction* 24, no. 2 (2011): 195-226, doi: 10.1353/ecf.2011.0040. Thompson’s article examines Richardson’s engagement with these ideas (though with a different focus than this chapter), exploring how Locke’s delineation of the difference between primary and secondary qualities is taken up in Richardson’s representations of masculine desirability.

available to its witness; like the automaton, his imaginative translation of the body into clockwork suspends it in the moments before death. In this way, both the automaton and Lovelace's clockwork metaphor incorporate the violence of anatomization while refusing its consequences, rendering their objects excoriated but resolutely functional. As the morbid destiny of the word "autopsy" hints, however, this kind of penetrative vision is inseparable from death; Lovelace's desire to know Clarissa's heart can only end with his final plea to preserve the stilled organ in a golden receptacle. This last fantasy replicates the others by installing Clarissa's most obscure part in an opaque container that is perpetually available for penetration by the rake's objectifying gaze. Instead, Clarissa's assertion in her will that her corpse "may not be unnecessarily exposed to the view of anybody" (1413) ensures that it quietly decomposes without yielding to Lovelace's regard.

Autonomy and automatic motion

Clarissa's representations of Lovelace's mechanist fantasies seem finally to mark them as sordid, violent, and doomed. As I will explore through the rest of this chapter, however, Richardson's own relationship to the theories and methods of the new science was a complex one, and it is not only in Lovelace's fantasies that Clarissa resembles a clock. In this section, I argue that Clarissa's virtue, while set up in opposition to Lovelace's libertine mechanism, is nonetheless represented as an automatic function—that is, as technological—by Richardson. By exploring Clarissa's clock-like qualities, this section explores how (and why) she is embedded in the mechanist paradigm of

perception, understanding, and embodiment that Richardson's representation of Lovelace appears to repudiate.

In order to begin, however, we must first consider what clocks themselves were like in the middle of the eighteenth century. Through the eighteenth century, England, along with the rest of Europe, was in the midst of a number of technological shifts that rapidly altered the form, function, and social significance of clockwork machines. These changes began in 1657, when Christiaan Huygens, a Dutch mathematician and scientist, invented the pendulum clock. Before Huygens's innovation, the accuracy of clocks was approximate at best: in fact, what was most regular about pre-Huygens clocks was that they "lost" up to 15 minutes a day. In contrast, the pendulum clock lost, at most, a mere 15 seconds.⁴⁰ Huygens's enhancement was followed by others, such as the invention of the balance spring, which similarly improved the function of portable pocket watches, and the refinement of individual mechanical parts (such as the escapement and oscillator) in order to increase the precision of timepieces still further.⁴¹ As many critics have noted, these modifications of clockwork technology altered not only the relative accuracy of individual timepieces, but also the way in which time itself was conceived and experienced. Stuart Sherman explains that

[w]here church bells and clock towers had for centuries tolled time intermittently and at a distance, Huygens's clocks, ticking steadily, translated time into a sound both constant and contiguous. For the tiny, persistent increments that the ear could newly hear, the eye found numerous equivalents on the dial-plate. Before the

⁴⁰ Stuart Sherman, *Telling Time: Clocks, Diaries, and English Diurnal Form 1660-1785* (Chicago: University of Chicago Press, 1996), 4.

⁴¹ Mayr, 14. The escapement is the mechanism that mediates between the energy-producing and regulatory elements of the clock, and which enables it to keep accurate time autonomously; the oscillator's regular movement (i.e., that of a pendulum) determines the unit of time measured by the clock. See Guye and Michel, 12.

advent of the pendulum, the vast majority of timepieces sported only a single hand, delegated to mark the hour....The earliest pendulum clocks, by contrast, bore an added hand to tell the minutes, now marked and numbered along the dial's outer edge. By 1670, a third hand had begun to appear on the most costly clocks; set within a small dial of its own, it tracked the seconds, spans so small as to elude notice only a few years before.⁴²

Early eighteenth-century writings on clockwork reflect the radical change that had altered both clocks and those who interacted with them, emphasizing most of all the unprecedented regularity of this new technology. *An Explanation of the Nature of Equation of Time*, a pamphlet from 1731, contends that “the true Reason of the Difference betwixt the Sun and Watches” is that

The Sun is always either gaining or losing: no two Natural Days together in the whole Year are exactly of the same Length. A good Watch, whose two Revolutions at any time are exactly equal to a Natural Day, must therefore in a little time sensibly vary from the same.⁴³

Likewise, in *The Artificial Clock-maker*, a technical manual originally published in 1696 and reprinted through the first half of the eighteenth century, William Derham explains that the invention of the pendulum clock was

found very serviceable, among other uses, particularly to these two. 1. To measure the time more exactly, and equally than the Sun. 2. To be (as Sir *Christoph. Wren* first proposed) a perpetual, and universal Measure, and Standard, to which all Lengths may be reduced, and by which they may be judged of, in all ages, and countries.⁴⁴

⁴² Sherman, 4-5.

⁴³ *An explanation of the nature of equation of time, and use of the equation table for adjusting watches and clocks to the motion of the sun* (London: F. Clay, 1731), 5, ECCO (CW3306929616).

⁴⁴ Derham, *The artificial clock-maker. A treatise of watch and clock-work* (London: James Knapton, 1714), 97, ECCO (CW108431991).

While clocks once needed to be corrected by the sun, the sun could now be corrected by clocks.⁴⁵ What made this exactitude especially startling was the way in which it was the product of the clock's own mechanisms. Whereas earlier clocks, with their propensity to "lose" time, had required frequent (even daily) interventions to find it again, the new clocks, once properly set, autonomously spun out precisely measured seconds, minutes, and hours.⁴⁶ During the eighteenth century the clock thus became the most widespread, and therefore the most familiar, example of the automaton, which Samuel Johnson defines as a "Machine that hath the power of motion within itself."⁴⁷

Within this context, Clarissa Harlowe emerges as, in a number of senses, clock-like. Consider, for example, the exactitude with which she regulates "the disposition of [her] time" (192): a precision first mocked by Arabella and later eulogized by Anna Howe in a letter to Belford that outlines the plan by which Clarissa ordered her days at Harlowe Place. Anna explains how Clarissa divided her days into measured increments, each of which she devoted to specific tasks, such as domestic management, charity, or leisure; every week she recorded this information in order to ensure that she "made her

⁴⁵ These writers show that Huygens' original goals for his pendulum invention—to "find the difference between the meridians with greater accuracy," to "measure time more accurately than the sun," and "to be a perpetual and universal measure" had, by the early eighteenth century, largely been achieved. See Guye and Michel, 102.

⁴⁶ Even Walter Shandy, that devotee of "extreme exactness," only needs to perform his notorious clock-winding ritual once a month.

⁴⁷ Johnson, *A dictionary of the English language*, Vol 1 (London: J. Knapton et al, 1756), s.v. "automaton," ECCO (CW111104919). Mayr confirms that during the early modern period "Clocks and automata...tended to be very much the same thing," noting that "in dictionaries from the sixteenth to eighteenth centuries, the automaton (a machine that moved independently on the strength of both a power supply and a plan of action, or program, of its own) was the higher, general category; the clock was merely a particular variety of automaton" (21). The term "automaton" itself was a relatively recent addition to the English language, first appearing in the early fifteenth century to describe, according to the *OED*, both a "moving device having a concealed mechanism, so it appears to operate spontaneously" and, relatedly, a "being or thing having the power of spontaneous motion or self-movement." See *Oxford English Dictionary Online*, s.v. "automaton," last modified June 2014, <http://www.oed.com/view/Entry/13474>.

account even” (1471). Further, Clarissa’s status as exemplar aligns her with clockwork technology’s new position as criterion: like the pendulum clock Derham describes, Clarissa functions as a “perpetual, and universal Measure, and Standard” against which others “may be judged of.” But perhaps Clarissa’s most clocklike quality is one of the first she is assigned within the text, when Anna celebrates her friend, in the first letter of the novel, as “So steady, so uniform in your conduct” (39). From this point forward, Clarissa’s remarkable steadiness is referenced frequently. Lovelace is both astonished and infuriated by it, and attempts to trace its genealogy in a letter to Belford late in the text:

How came the dear soul (clothed as it is with such a silken vesture) by all its steadiness?—Was it necessary that the active gloom of such a tyrant of a *father* should commix with such a passive sweetness of a will-less *mother*, to produce a constancy, and equanimity, a steadiness, in the *daughter*, which never woman before could boast of? (852)

Clarissa herself attributes a different provenance to this aspect of her moral ascendancy.

In a letter to Anna discussing the reasons for her absolute refusal to accept Solmes as a husband, Clarissa justifies her rebellion by explaining that

Steadiness of mind...when one is convinced of being in the right (otherwise it is not steadiness, but obstinacy), and in *material* cases, is a quality, my good Dr Lewin was wont to say, that brings great credit to the possessor of it; at the same time that it usually, when *tried* and *known*, raises *such* above the attempts of the meanly machinating. He used therefore to inculcate upon me this steadiness upon laudable convictions. Any why may I not think that I am now put upon an exercise of it? (105)

Clarissa’s description of her steadiness shows that Lovelace’s search for an original source outside her is misguided. Though fostered by Lewin’s instruction, it is ultimately a quality that arises from within, “when one is convinced of being in the right.” That is,

while Lewin has taught Clarissa that steadiness is creditable, it is she who generates the “laudable convictions” upon which it is exercised.

We can see this process of self-generated steadiness in action as the conflict between Clarissa and the rest of the Harlowe family reaches an inevitable point of crisis. The plan to remove Clarissa to her Uncle Anthony’s has been abandoned after Lovelace has intimated that he will find a way to intercept and prevent the trip; instead, Betty Barnes informs Clarissa, her marriage to Solmes will be performed in her own chamber at Harlowe Place in less than a week. Clarissa impulsively contacts Lovelace, agreeing to escape with him, and then writes to Anna, asking for her “approbation, or [her] censure” (353) of this step. Anna’s response counsels Clarissa either to accept her own offer of assistance, or to escape with Lovelace and marry him as soon as possible. Clarissa’s answer rejects both of these possibilities; instead, she explains to Anna that after much consideration, she has decided to remain at Harlowe Place, because

My heart...misgives me less when I resolve *this* way, than when I think of the other: and in so strong and involuntary a bias, the *heart* is, as I may say, *conscience*. And well cautions the wise man: ‘Let the counsel of thine own heart stand; for there is no man more faithful to thee, than it...’ (362)⁴⁸

Clarissa locates her moral guide in her own heart, and assigns to its dicta both paramount importance and an automatic force. Her heart’s bias is, as she says, an “involuntary one”;

⁴⁸ Clarissa’s references to her heart evoke a number of meanings. As Park writes, “[b]y the time the word appears in Johnson’s *Dictionary of the English Language* in the middle of the eighteenth century, ‘the heart’ secures prominence, both in medical terminology as a central body part—‘the muscle which by its contraction and dilation propels the blood through the course of circulation, and is therefore considered as the source of vital motion’—and ‘in popular language’ as ‘the seat sometimes of courage, sometimes of affection’” (57). In *The Self and It*, Park explores the relationship between eighteenth-century sensibility and Freudian fetishism, arguing that Lovelace’s quest to determine whether Clarissa is a woman or an angel exemplifies a fetishistic insistence, shared by Richardson himself, on “objectifying female subjectivity in terms of its body parts in order to overcome the anxiety of affective as well as anatomical lack” (76).

its pronouncements controvert the will of her family, her closest friend's advice, and her own previously chosen plan to escape her father's house. Nevertheless, it is in its motions that Clarissa traces the requirements of conscience and virtue, and where her final resolution to "stand this one trial" (361) is generated—her determination to remain steady in the face of her family's cruelty, as well as the demands of her supposed champion, Lovelace.⁴⁹ These motions, ranging as they do "this way" and that, echo those of a clock's pendulum, suggesting that even in its oscillations—in fact, through them—her heart produces steadiness. As Huygens wrote in his original description of his invention, it is "the true nature and property of a pendulum that it will necessarily always maintain uniformity, from which it will never deviate unless the length be altered...unless it happens by some [impediment] the timepiece is stopped, no slowing or inequality of motion need be feared."⁵⁰ Until Clarissa's heart stops, it similarly produces an undeviating steadiness, something Lovelace recognizes even as he strives to impede it. He explains to Belford that

her LOVE OF VIRTUE seems to be *principle*, native, or if *not* native, so deeply rooted that its fibres have struck into her heart, and, as she grew up, so blended and twisted themselves with the strings of life that I doubt there is no separating of the one, without cutting the others asunder. (657)

Lovelace's characterization of Clarissa's virtue as something "blended and twisted" into her heart, such that the operations of life and virtue are ultimately inextricable, recalls

⁴⁹ The novel's language of trial has scientific as well as religious connotations: Helen Thomson points out that Lovelace, "Like a Boylean chemist...aims to test [Clarissa's] apparent virtue 'as gold is tried by fire'" (209). Ann Jessie Van Sant also notes the language of experiment that recurs in Lovelace's attempts to interpret Clarissa: see *Eighteenth-Century Sensibility and the Novel: The Senses in Social Context* (Cambridge: Cambridge University Press, 1993), 66.

⁵⁰ Huygens, "The Timepiece of Christiaan Huygens of Zulichem," trans. Ernest L. Edwardes, in *The Story of the Pendulum Clock*, Ernest L. Edwardes (Altrincham: John Sherratt and Son, 1977), 89.

Clarissa's earlier description of her heart's conscience, and extends it by linking her moral steadiness to the organ's physiological function. In this image, the beating of Clarissa's heart marks her virtue as a self-generated and continuous quality – much like the ticking of a clock (or the swinging of its pendulum) signifies its regularity. As the text alternately questions and attempts to explain the nature of Clarissa's virtue, her own account and the assessments of others together assert that her moral steadiness is one which "hath the power of motion within itself, and which stands in need of no foreign assistance." It is, in a word, automatic.

Throughout the novel, many of the physical reactions that Clarissa describes as involuntary or unthinking align with her moral convictions: a tendency that emphasizes the extent to which her automatic physical response is implicated in those convictions, and can even be said to guide them. We can see this clearly by tracing Clarissa's reactions to Solmes during the traumatic courtship she endures at Harlowe Place. During one of her enforced meetings with him, she describes to Anna how Solmes

took the removed chair and drew it so near mine, squatting in it with his ugly weight, that he pressed upon my hoop—I was so offended (all I had heard, as I said, in my head) that I removed to another chair. I own I had too little command of myself. It gave my brother and sister too much advantage. I dare say they took it—but I did it involuntarily, I think; I could not help it—I knew not what I did.
(87)

While Clarissa's reaction might at first seem like an expression of sexual disgust, she connects her antipathy to "all I had heard," referencing her last letter to Anna in which she explains how she has discovered the true reasons for her family's opposition of the match with Lovelace and subsequent support of Solmes's suit: reasons more rooted in sibling rivalry and a grasping ambition to "raise the family" than in objections to

Lovelace himself. Moreover, Clarissa has recently learned that Solmes's attractive settlement offer has been made possible by his plan to "*rob*" his relations of "their just expectations" and "settle all he is worth upon me," an action Clarissa repeatedly denounces as "unjust" (81). Clarissa's disgusted response to Solmes is thus linked to her moral objections to the project—spearheaded by James and Arabella—to marry her to an "*upstart man*" (81) for profit while simultaneously punishing her for the inappropriate favour she received in her grandfather's will. While Clarissa's reaction is improper (as she owns to Anna herself), it is also automatic, as she articulates in three different ways: it was "involuntary," she "could not help it," she "knew not what [she] did." This pattern of reflexive moral disgust continues, to Clarissa's detriment, as the pressure from her family becomes increasingly intense. After her mother entreats her to "Go in again Mr Solmes, and behave discreetly to him," Clarissa relates how "My feet moved (of themselves, I think) farther from the parlour where [Solmes] was, and towards the stairs," leading her mother to condemn her as "Obstinate, perverse," and "undutiful" (115-116). Later, she attempts to refute these charges in a letter to her Uncle Anthony, explaining that

it is not obstinacy I am governed by: it is aversion; and aversion I cannot overcome: for, if I have but *endeavoured* to reason with myself (out of regard to the duty I owe to my papa's will) my heart has recoiled, and I have been averse to myself for offering but to argue with myself, in behalf of a man who, in the light he appears to me, has no one merit; and who, knowing this aversion, could not persevere as he does, if he had the spirit of a man, and a gentleman. (153)⁵¹

⁵¹ The choice of the word "recoil" here may remind us of clockwork springs (which had also been a key component of clockwork mechanisms since the fifteenth century, and improved the accuracy and steadiness of watches in the seventeenth: see Guye and Michel, 43-44 and 104) but in clocks and watches the spring functions through a gradual *uncoiling* rather than a quick *recoiling*. Nonetheless, from the 14th century forward, the action of "recoiling" had been linked to the rebounding movement of a gun after discharge—

Clarissa's effort to explain the self-moving nature of her objections to Solmes—a nature captured vividly in the image of a heart that flinches from her attempts to apply the Harlowe logic—is the subject of derision in her uncle's response: "Finely described, i'n't it!" he sneers, before dismissing her intransigent heart as an example of "a most horrid romantic perverseness" (155) and insisting that "You *permit* your heart...to *recoil*" (158).

In these descriptions of Clarissa's reactions to Solmes, Richardson sets up an intriguing dichotomy. If Clarissa has control over her heart—if she "permits" it to recoil—she is, as her family accuses, obstinate, perverse, and rebellious. If, however, her heart reflexively shrinks from Solmes in an involuntary motion, the action is an expression of the way in which virtue is, as Lovelace posits, inherent in that organ's operations. Since the text vindicates Clarissa's reaction to Solmes in the conclusion, "Supposed to be written by Mr Belford" (1489), which opines that Solmes's "general behaviour and sordid manners are such as justify the aversion the excellent lady had to him" (1490), the latter interpretation is clearly the one that Richardson endorses.⁵² The language of automatism thus plays a key role in the text's descriptions of Clarissa's virtue. Not only is her steadiness marked as a self-generated response, the specific

and therefore, to both mechanical processes and automatic motion. See *Oxford English Dictionary Online*, s.v. "recoil, v.1," last modified June 2014, <http://www.oed.com/view/Entry/159668>.

⁵² Thus, while Juliet McMaster asserts that Clarissa's "basic and irrefutable reason" for rejecting Solmes is "physical, not moral," as shown in the way "her body shrinks from his" (103), I argue that this distinction is a false one, since Clarissa's physical responses are represented by Richardson as themselves innately moral. See McMaster, *Reading the Body in the Eighteenth-Century Novel* (London: Palgrave Macmillan, 2004). John Mullan argues that the dictates of Clarissa's heart are part of a Richardsonian system in which "the woman's body is the mediator of the truth of sentiment": a body that is "beyond her control yet displays her virtue" (113). See also Hina Nazar's "Judging Clarissa's Heart," *ELH* 79, no. 1 (2012): 85-109, <http://www.jstor.org/stable/41337580>, for a sensitive reading of the ways in which this representation of Clarissa's intrinsically just heart is linked with both Christian traditions and Enlightenment perspectives on morality and autonomy.

accounts the text provides of this response in motion indicate the extent to which it is largely an involuntary one. In this way, the novel defines Clarissa's potentially transgressive autonomy as the opposite of willful action.

As it exculpates Clarissa's rebellion, this clockwork heart is one mechanism in Richardson's revision of earlier eighteenth-century fictions in his sentimental novel. In particular, by making Clarissa's virtue automatic, Richardson rewrites the passionate heart into a virtuously mechanical one. In the Galenic model of embodiment, which had prevailed for centuries, the heart was the seat of the vital or irascible soul, which produced "innate heat" and "states of passion," so moving the body to involuntary actions unbidden by the rational soul.⁵³ Within this framework, the passions were understood to be "fundamentally destructive and in need of restraint" because of their dangerous violations of rational understanding.⁵⁴ These passions were, in their own way, mechanical: Scott Paul Gordon describes how "the term 'passion'...refers literally to a passive state, being acted upon," and notes that "early modern discourse often uses the terms 'passive' and 'mechanical' interchangeably."⁵⁵ Passionate experience was a key aspect of the aristocratic romance and of the early novels that drew on and modified its tropes. In Eliza Haywood's amatory fiction, for example, we can see "precisely these moments of intense passion when people become passive machines that cannot be judged morally," as Joseph Drury has observed. Drury's reading of *Love in Excess* argues that

⁵³ Eve Keller, *Generating Bodies and Gendered Selves: The Rhetoric of Reproduction in Early Modern England* (Seattle: University of Washington Press, 2007), 36.

⁵⁴ Adela Pinch, *Strange Fits of Passion: Epistemologies of Emotion, Hume to Austen* (Stanford: Stanford University Press, 1996), 18.

⁵⁵ Gordon, *The Power of the Passive Self in English Literature, 1640-1770* (Cambridge: Cambridge University Press, 2002), 8.

Haywood identifies passive mechanism with the Hobbesian, materialist libertinism reprised by Lovelace, and counters the “amoral determinism simulated by libertine machines” with heroines “equipped with a deliberating consciousness” that allows them to resist passionate action.⁵⁶ In this early-eighteenth-century fiction, then, mechanism is linked with the amoral, anti-rational passivity of those bent to the motions of their passionate heart. By the time Haywood published *The History of Miss Betsy Thoughtless* 30 years later in 1751, however, her heroine is positively described as a “fair machine.” Rebecca Tierney-Hynes identifies this “final iteration of [Haywood’s] passionate female protagonist” as a “clockwork construction” whose regular machinery is the “rationalized product of a long history of theorizing the passions” and the increasing influence of mechanism on theories of embodiment.⁵⁷ Just as Haywood revises her representations of the passionate heart by mid-century, Richardson rewrites the passionate body of romance into a new configuration. While Haywood’s “fair machine” is characterized by newly manageable passions, Richardson’s clockwork heroine works differently, her automatic heart producing virtuous actions instead of the passionate heart’s amoral and destructive ones.

By representing Clarissa’s virtue not just as automatic, but as automatically *steady*, Richardson expresses its location in a new kind of bourgeois capitalist subjectivity. As Max Weber writes in his archetypal assessment, *The Protestant Ethic and the Spirit of Capitalism*, a key component of what he calls the “rational asceticism”

⁵⁶ Drury, “Haywood’s Thinking Machines,” 211-214.

⁵⁷ Tierney-Hynes, “Fictional Mechanics: Haywood, Reading, and the Passions,” *The Eighteenth Century: Theory and Interpretation* 51, nos. 1-2 (2010): 167, doi: 10.1353/ecy.2010.0005.

that characterized the nascent middle class was the pursuit of labours of a “systematic, methodical character.” This “worldly asceticism”⁵⁸ secularized the devotional rhythms of the monastery and instated the bourgeois subject as one who aspired to live “rationally and with a methodical division of time.”⁵⁹ As Lewis Mumford observes, the ascent of this secular Protestant ethic was intimately linked with innovations in technologies of keeping time. He notes that though labour had long depended on rhythms such as the cycles of the sun, moon, and seasons, or, more locally, the beats of “the workshop song...or the chantey of sailors tugging at a rope,” the introduction of the household clock—and with it, the concept of regularized time—altered these modes of demarcation.⁶⁰ “When one thinks of the day as an abstract span of time,” Mumford writes,

one does not go to bed with the chickens on a winter’s night: one invents wicks, chimneys, lamps, gaslights, electric lamps, so as to use all the hours belonging to a day. When one thinks of time, not as a sequence of experiences, but as a collection of hours, minutes, and seconds, the habits of adding time and saving time come into existence. Time took on the character of an enclosed space: it could be divided, it could be filled up, it could even be expanded by the invention of labor-saving instruments. (17)

Further, the concept of regularity itself was intimately bound up with clockwork technology, which was able to dissociate “time from human events”—and from the familiar but irregular rhythms of the sun, the moon, and the human heartbeat—“and helped create the belief in an independent world of mathematically measureable sequences,” increments that maintained a previously unimaginable constancy (15). By

⁵⁸ Weber, *The Protestant Ethic and the Spirit of Capitalism* (New York: Scribner, 1958), 161-167.

⁵⁹ Gerhard Dohrn-van Rossum, *History of the Hour: Clocks and Modern Temporal Orders* (Chicago: University of Chicago Press, 1996), 10.

⁶⁰ Mumford, *Technics and Civilization* (New York: Harcourt, Brace & World, 1963), 17. References are to this edition.

linking Clarissa's steadiness to her automatic motions, Richardson embeds the abstract criterion of bourgeois Protestant virtue into the rhythms of his heroine's body, replacing the destructive passions that issued, in aristocratic romance and amatory fiction, from the hearts of women.⁶¹ By rendering Clarissa's virtue inherent and automatic, Richardson makes it at once as durable as the beating of her heart, and as artificially "constant and contiguous" as the clock to which Lovelace compares Clarissa on her deathbed. Even then, though she is weak, the "springs and wheels of life and motion" (and the virtue they generate) still operate with a force as steady and autonomous as systole and diastole—or tick and tock—as Clarissa approaches her triumphant end.

Finer springs

This clockwork heart, carefully opened for Richardson's readers across seven volumes, ultimately suggests similarities between Lovelace's fantasy of Clarissa and Richardson's fictional representation of her, since Clarissa's interiority is imagined by both men as a technological construction. They are not the only ones who envisioned it so. We might recall Samuel Johnson's positive comparison of Richardson's fiction to the work of Henry Fielding: that the difference was "as between a man who knew how a watch was made, and a man who could tell the hour by looking on the dial-plate."⁶²

⁶¹ Paradoxically, Richardson's automation of virtue naturalizes the systems of conduct thought to produce the virtuous bourgeois self: for example, the "regularity" that engenders "habits of constancy and steadiness" for young women and the "modesty" that, as a "Science of decent motion...checks and controls all rude exorbitancies." The quotation on regularity is from Hester Chapone's *Letters on the Improvement of the Mind* (1773) and the reflections on modesty from Richard Allestree's *A Lady's Calling* (1673); both are quoted in Park, 126, where she notes their shared language of mechanism.

⁶² Quoted in Ian Donaldson, "The Clockwork Novel: Three Notes on an Eighteenth-Century Analogy," *Review of English Studies* 21, no. 81 (1970), 14, <http://www.jstor.org/stable/513710>.

Johnson's commendation of Richardson's fiction links the skill of an author he elsewhere described as one "from whom the age has received greater favours, who has enlarged the knowledge of human nature, and taught the passions to move at the command of virtue"⁶³ to a clockmaker's mastery of the motions concealed beneath a clock's face. Richardson himself employed the same image in a letter to Sarah Fielding, as part of another comparison to her brother. Celebrating Sarah Fielding's fiction, and probably referencing Johnson, Richardson writes,

What a knowledge of the human heart! Well might a critical judge of writing say, as he did to me, that your late brother's knowledge of it was not (fine writer as he was) comparable to your's [*sic*]. His was but as the knowledge of the outside of a clock-work machine, while your's was that of all the finer springs and movements of the inside.⁶⁴

Extending the implications of the metaphor he reprises, Richardson's celebration of Sarah Fielding's mastery of the "springs and movements" of the heart performs the same conceptual shift between deconstructed clock and demystified interior that Lovelace does when he imagines Clarissa as a clock, suggesting once again that the rake's perceptual model is linked to Richardson's strategies of novelistic representation. By attending to the points of contact between Richardson's mimetic project and Lovelace's mechanistic fantasies, we can see how the author's celebrated "knowledge of the human heart"—gained, Johnson claims, by "div[ing] into its recesses"—replicates the modes of perception and understanding pursued by his villain.⁶⁵

⁶³ Johnson, "Rambler no. 97," in *The Rambler* (London: P. Dodsley et al, 1794), 2:245, ECCO (CW117086189).

⁶⁴ Richardson to Sarah Fielding, 7 December 1756, in *The Correspondence of Henry and Sarah Fielding*, ed. Martin C. Battestin and Clive T. Probyn (Oxford: Clarendon Press, 1993) 132.

⁶⁵ James Boswell, *Life of Johnson*, ed. G.B. Hill and L.F. Powell, 2nd ed (Oxford: Oxford University Press, 1950), 2:174, 49.

A productive place to begin is Richardson's defense of "the length of the piece"—to which, he notes irascibly, "some have objected"—found in the novel's postscript. He writes that

there was frequently a necessity to be very circumstantial and minute, in order to preserve and maintain that air of probability, which is necessary to be maintained in a story designed to represent real life; and which is rendered extremely busy and active by the plots and contrivances formed and carried on by one of the principal characters. (1499)

The text anticipates Richard's argument with remarks by several characters, such as when Clarissa assures Anna, early in the work, that she "will continue to write as I have opportunity, as minutely as we are used to write to each other" (53), or when Anna subsequently urges her friend to "Continue to be as particular as possible" (87). Nowhere is Richardson's thesis about minute particulars and probable fictions more fully elaborated, however, than in Lovelace's letters. "I never forget the *minutiae* in my contrivances," he explains to Belford when describing his scheme to immure Clarissa in a brothel without her knowledge, maintaining that "In all *doubtable* matters the *minutiae* closely attended to and provided for are of more service than a thousand oaths, vows and protestations made to supply the neglect of them" (473). Later, while instructing the false Tomlinson to wear his riding-dress when calling on Clarissa, and to ensure that his boots are not "over clean," Lovelace reminds him that "I have always told you the consequence of attending to the *minute*, where art (or *imposture*, as the ill-mannered would call it) is designed" (961). The rake describes the way in which these minutiae can concatenate to produce impressive consequences when he writes Belford just before he sets the fire plot in motion:

And now a little mine which I am getting ready to spring...A *little* mine, I call it. But it may be attended with great effect. I shall not, however, absolutely depend upon the success of it, having much more effectual ones in reserve. And yet great engines are often moved by little springs. A small spark falling by accident into a powder magazine has sometimes done more execution than an hundred cannon. (709)

Lovelace's incorporation of mechanistic language at this moment is telling, for the concept of minuteness was important to the work of mechanical philosophers.⁶⁶ As I discussed briefly in the previous section, one of the alterations that the new science wrought upon perceptions of the natural world was its assertion of an equivalency between the properties of all matter. Mechanical philosophers intervened in this rhetoric of equivalency by arguing that the ostensibly mysterious processes of nature were analogous to those of mechanical objects: this was because the difference between the two categories was one of *scale* and not of kind. Thus Descartes could write,

I do not recognize any difference between artefacts and natural bodies except that the operations of artefacts are for the most part performed by mechanisms which are large enough to be easily perceivable by the senses—as indeed must be the case if they are to be capable of being manufactured by human beings. The effects produced by nature, by contrast, almost always depend on structures which are so minute that they completely elude our senses.⁶⁷

The same concept of scale characterizes Boyle's description of his scientific practice in *The Excellency of Theology Compared with Natural Philosophy* (1664): he writes that it

⁶⁶ While, in this section, I concentrate on the links between Richardson's use of the "minute" and the mechanical philosophy, it should also be noted that the "minute particular" was, as Tita Chico has shown, "the commonly used term for the 'fact' that microscopy produc[ed]," suggesting the links between this way of conceptualizing the properties of matter and specifically visual, specifically *technological* modes of perception. See Tita Chico, "Minute Particulars," 144. Previous analyses of Richardson's "preoccupation with minutiae" have linked this feature of his fiction with the tradition of Puritan self-examination: see Cynthia Wolff, *Samuel Richardson and the Eighteenth-Century Puritan Character* (Hamden: Archon Books, 1972) 20.

⁶⁷ Descartes, "Principles of Philosophy," 209.

is one that “give[s] an account of the Phaenomena of Nature by the Motion and other Affections of the minute Particles of Matter,” which, “because they are obvious and very powerful in Mechanical Engines,” he “sometimes...term[s]...the Mechanical Hypothesis or Philosophy.”⁶⁸ In *The Origin of Forms and Qualities according to the Corpuscular Philosophy* (1666), Boyle directs the reader’s attention to the importance of such imperceptible systems, insisting that “We must not look upon every distinct body, that works on our senses, as a bare lump of matter of that bigness and outward shape, that it appears of; many of them having their parts curiously contrived, and most of them perhaps in motion too”; he calls upon the familiar example of clockwork technology to explain the importance of these minute interactions, explaining that

as in a clock, a small force applied to move the figure to the index of 12, will make the hammer strike often and forcibly against the bell, and will make a far greater commotion among the wheels and weights than a far greater force would do, if the texture and contrivance of the clock did not abundantly contribute to the production of so great an effect.⁶⁹

In another passage from Boyle—this one drawn from 1663’s *Some Considerations Touching the Usefulness of Experimental Natural Philosophy*—he applies the same argument to the human body’s systems, using imagery that prefigures Lovelace’s ruminations on the surprising efficacy of a “*little mine*.” Boyle explains that he considers “the body of a living man, not as a rude heap of limbs and liquors, but as an engine consisting of several parts so set together, that there is a strange and conspiring

⁶⁸ Boyle, “Some Specimens of an Attempt To make Chymical Experiments Useful to Illustrate the Notions of the Corpuscular Philosophy,” in *Certain Physiological Essays and other Tracts* (London: Henry Herringman, 1669), 122, EEBO.

⁶⁹ Boyle, *The Origin of Forms and Qualities according to the Corpuscular Philosophy*, in *Selected Philosophical Papers of Robert Boyle*, ed. M.A. Stewart (1666; Indianapolis: Hackett, 1991), 33.

communication betwixt them,” such that “a very weak and inconsiderable impression of adventitious matter upon some one part may be able to work on some other distant part, or perhaps on the whole engine” effects “far exceeding what the same adventitious body could do upon a body not so contrived” (537).⁷⁰ Boyle’s description contrasts the Galenic body—here figured as a leaky “heap”—with the mechanically structured one, made systematic and comprehensible by the philosopher’s technologizing perception, which translates the “bare lump of matter” into an engine. The “conspiring communication” this vision apprehends in the formerly obscure interior resembles how

[t]he faint motion of a man’s little finger upon a small piece of iron, that were no part of an engine, would produce no considerable effect; but when a musket is ready to be shot off, then such a motion being applied to the trigger by virtue of the contrivance of the engine, the spring is immediately let loose, the cock falls down, and knocks the flint against the steel, opens the pan, strikes fire upon the powder in it, which by the touch-hole fires the powder in the barrel, and that with great noise throws out the ponderous leaden-bullet, with violence enough to kill a man at seven or eight hundred foot distance.⁷¹

In Boyle’s description, the human body deciphered by the mechanical philosopher is a warm gun. His metaphorical construction separates out the objectified gun-engine-body and the one who is able, by applying the faintest pressure, to control the outcomes of its motions. Boyle’s description, which is mirrored in Lovelace’s martial language, suggests

⁷⁰ Boyle, *Some Considerations Touching the Usefulness of Experimental Natural Philosophy*, in *The Works of the Honourable Robert Boyle in Six Volumes, A New Edition* (1663; London: J. Rivington et al, 1772), 2:175, ECCO (CW3314952176).

⁷¹ Boyle, *Some Considerations*, 2:175. Harvey uses the same metaphor in *De Motu Cordis* to describe the motions of the heart: “Nor is this otherwise done, than when in *Engines*, one wheel moving another, they seem all to move together; and in the lock of a piece, by the drawing of a spring, the flint falls, strikes the steel, fires the powder, enters the touchhole, discharges, the balls fly out, pierces the mark, and all these motions by reason of the swiftness of them, appear in the twinkling of an eye...” (31).

that by perceiving the operations of these intricate collections of cause and effect, the mechanical philosopher places himself behind the trigger rather than in front of the bullet.

Lovelace arms his weapon by using his facility with the minute to construct devices that replace reality with fictions more appropriate to his purposes. Such devices proliferate in concert with *Clarissa*'s pages, as Lovelace fabricates people (Captain Tomlinson, the false Lady Betty Lawrence and Charlotte Montague, the gouty old man at Hampstead), places (the respectable lodging on Dover Street), things (letters by Anna and Clarissa) and events (the pursuit that terrifies Clarissa into fleeing with him from her garden, the illness he uses to test her feelings, the fire that precipitates his first rape attempt). Like his description of the "*little mine*," Lovelace's accounts of these contrivances repeatedly reference mechanical operations. In a letter to Belford describing the ways he has used his influence over the servant Joseph Leman to manipulate Clarissa's family, and particularly her "brutal brother," into "danc[ing]...upon my own wires," he gloats that "By this engine, whose springs I am continually oiling, I play them all off" (144); later, the same image of machine components reappears as the rake glories in having "this inimitable creature absolutely in my power" along with all of her friends and relations, boasting that "her brother and uncle were but my pioneers: her father stormed as I directed him to storm. Mrs Howe was acted by the springs I set at work: her daughter was moving for me, and yet imagined herself plumb against me" (517).⁷²

⁷² Like Boyle's in his description of the body, Lovelace's language of mechanism is weaponized. More specifically, with its references to mines, engines, and pioneers, it is the language of siege. In addition to "drawing on the heroic vocabulary of war that distinguished Restoration drama" and its "tyrant heroes and lovers" (M John Cardwell, "The Rake as Military Strategist: *Clarissa* and Eighteenth-Century Warfare," *Eighteenth-Century Fiction* 19, no. 1 [2006]: 161, doi: 10.1353/ecf.2006.0074), the grandiose way that Lovelace invokes imagery of military technology recalls early modern scholarly and popular interest in

Appropriately, the rake's devices are frequently named "machinations" by those caught within them, as when Clarissa writes to Anna that the Harlowe plan to hurriedly marry her to Solmes was "often excused by the certain information they pretended to have of some plots or machinations, that were ready to break out from Mr. Lovelace" (348), or later laments that once in his power, "nothing less than the intervention of the paternal authority...could have saved me from the effect of his deep machinations" (989).

"Machine" and "machination" are linked through their common Latin root *māchina*, which has a number of senses ranging from "a machine, i.e. any artificial contrivance for performing work, an engine, fabric, frame, scaffolding, staging, easel, warlike engine, military machine, etc." to "a device, plan, contrivance; esp. a trick, artifice, stratagem."⁷³

While "machine" and "machination" elaborate this root differently, *Clarissa's* descriptions of Lovelace's "complicated wickedness" (986) draw our attention to how both of these terms signify "complex device[s], consisting of a number of interrelated parts, each having a definite function" and that "perform a certain kind of work."⁷⁴ At the heart of Lovelace's understanding of these "artificial contrivances"—of the strategies for successfully constructing what we can name either "art" or "*imposture*"—is his knowledge, fruitfully translated from the work of mechanical philosophers to the work of making fictions, that "great engines are often moved by little springs." Through his

classical siege engines, representations of which "invested the world of mechanism with a kind of chivalric glamour, reminding the onlooker not only of the antiquity of mechanism itself, but also of the link to the noble practice of the arts of war." See Sawday, *Engines of the Imagination*, 86.

⁷³ Charlton T. Lewis and Charles Short, *A Latin Dictionary. Founded on Andrews' edition of Freund's Latin dictionary* (Oxford: Clarendon Press. 1879), s.v. "māchina."

⁷⁴ *Oxford English Dictionary Online*, s.v. "machine, n.," last modified December 2014, <http://www.oed.com/view/Entry/111850>.

attention to such minute particulars, Lovelace ensures that it is almost impossible, even for the painstakingly scrupulous Clarissa, to discern any difference between artifice and actuality.

While Richardson deprecates Lovelace's machinations, the rake and the novelist are allied in their attempts to reproduce the effects of nature by constructing "structures which are so minute" that their operations "completely elude" the senses of those who experience them.⁷⁵ As Richardson puts it in the quotation I referenced near the beginning of this section, the proliferation of the "very circumstantial and minute" in the narrative is required "in order to preserve and maintain that air of probability, which is necessary to be maintained in a story designed to represent real life" (1499). The possibility that an artificial contrivance, made sufficiently elaborate, will be able to mimic reality so perfectly that it is ultimately indistinguishable from it is one of the key premises of Richardson's *Clarissa*: hence the length of the text, a side-effect of the subtle intricacies of action and interiority painstakingly detailed within it.⁷⁶ The extent to which theories of

⁷⁵ In this sense, my argument differs from Thomas Keymer's, which is that Richardson allies himself with "Lovelacean ways of seeing" in order to "provide a kind of temptation designed in the end to promote self-awareness, resistance and a reassertion within the reader of all the values, moral and human, that the tempter seeks to destroy," no matter how much this project might get away from Richardson in the end; see Keymer's *Richardson's Clarissa and the Eighteenth-Century Reader* (Cambridge: Cambridge University Press, 2004), 193-194, 196. I contend instead that "Lovelacean ways of seeing" (and doing) extend to the level of authorship itself, since Richardson's acts of fictional creation are premised on the same terms as Lovelace's acts of "art, or imposture."

⁷⁶ This minuteness is likewise linked to sexual violence. Simon Dickie, following Frances Ferguson, demonstrates that the imperative for minute detail is particularly urgent in *Clarissa* due to of the difficulties involved in representing a virtuous survivor of rape in the eighteenth century. "It is clearly no accident," Dickie writes, "that the greatest technical advances of early psychological realism occurred in first-person rape narratives," since "a sympathetic rape plot...required new ways of representing intentional states. Richardson's attempts to elicit sympathy for his victim-heroines demanded an exhaustive focus on their mental states—their repeated refusal of consent." See Dickie, *Cruelty and Laughter: Forgotten Comic Literature and the Unsensational Eighteenth Century* (Chicago: University of Chicago Press, 2011), 222; and Frances Ferguson, "Rape and the Rise of the Novel," *Representations* 20 (1987): 88-112, <http://www.jstor.org/stable/2928503>.

mechanical philosophy enable this premise is evident not only in the rhetoric through which Lovelace's fictions are described, but through Richardson's own reflections on the possibilities of mimesis. His appraisal of Sarah Fielding's accomplishments, quoted in full above, moves quickly from celebrating her "knowledge of the human heart!" to averring that this superior knowledge is akin to understanding "all the finer springs and movements of the inside" of a "clock-work machine." What is significant about this commendation is not simply the equivalency it posits between biological and mechanical functions—itself deeply rooted in the work of mechanical philosophers—but also its suggestion that this equivalency allows the novelist to construct an artificial version of the human heart that works like a real one. For it is the author's minute knowledge of the heart, Richardson theorizes, that makes the difference between one who is merely a "fine writer," like Henry Fielding, and one like Sarah Fielding—or himself—who is able to successfully represent "real life." This knowledge was produced by an objectifying vision that allowed a witness to "[lay] open...the secret recesses of the heart" and, in particular, to "penetrate into the secrets, and unwind the mazes of the *female* heart" by translating that heart into a mechanical system.⁷⁷ These quotations from Anna Laetitia Barbauld and Frances Sheridan—which might at first appear to describe Lovelace but in fact celebrate Richardson's gifts as a writer of fiction—express the vital relationship between the rake's violent mechanism and Richardson's mimetic project, both of which seek to expose Clarissa's obscure interior through their ingenious mastery of it. While Lovelace seeks to

⁷⁷ Quoted in Van Sant, *Eighteenth-Century Sensibility and the Novel*, 62 (emphasis mine), where Van Sant likewise observes the links between "Richardson's novelistic aims and general talents" and Lovelace's interest in Clarissa's "secret recesses."

despoil Clarissa's virtue, and Richardson merely to describe it, both are engaged in a process of understanding in which a male witness converts a woman's body into an object available to his demystifying gaze. Like the mechanical philosopher (or the rake), the writer of mimetic fiction strove to decipher the imperceptible causes of human action, "extricat[ing] the means and reasons of the motive function," as Thomas Willis did, "either by truths or next to truths."⁷⁸ Johnson's characterization of Richardson as "a man who knew how a watch was made" (later echoed by Richardson himself) uses the clockmaker figure central to mechanical philosophy to link the novelist's minute knowledge of the heart's "motive functions" with his ability to replicate them: Richardson is not simply a man who knows how a watch is made, but a man who *makes watches*, a man who constructs textual *māchina* that move, like Chovet's automaton, "as in breathing." Richardson is finally both author and engineer, a "creator of cunning devices, deploying wheels, springs, and balances" in a scheme "as much intellectual as practical."⁷⁹ His greatest invention is a clockwork woman.

My argument would seem to suggest that Clarissa is never out of our sight, perpetually suspended (as in Lovelace's fantasy) between life and death before the curious observers for whom she is even now discovered. This Clarissa is defined by her given name: as Gordon notes, its Latin root is "*clarus*,"⁸⁰ signifying that which, "relating to the sight," is "clear," or, tropogically, a thing "manifest, plain, evident" and

⁷⁸ Willis, 39.

⁷⁹ Sawday, *Engines of the Imagination*, 99-100.

⁸⁰ Gordon, 188. Gordon points out that Mrs. Harlowe's lament about the "unhappy body's power of painting her distresses so as to pierce a stone," with the verb 'painting,' "transforms [Clarissa] into an opaque exterior hiding secret ambitions."

“intelligible.”⁸¹ The work of making Clarissa’s interiority both “evident” and “intelligible” is indeed the text’s central concern, one which has long made it a crucial work to critical understandings of both eighteenth-century female subjectivity and of the novel genre that represented it. And yet, even at the end of the seven volumes that infamously make *Clarissa* one of the longest fictions ever written, something escapes us. The struggle of interpretation that continues over Clarissa (and of which this chapter is a part) suggests that the knowledge-seeking subject’s autopsying eye, in attempting to chain the slippery Proteus until “all her mighty mysteries she descr[ys],”⁸² somehow multiplies her obscurities. Translating a body into a object—whether a clock or a book—in an attempt to reveal its mechanisms is a project that attempts to perceive and describe structures that remain “so minute that they completely elude our senses”; this project is fundamentally a work of fiction organized around the impossibility of truly seeing and mastering what is most desired. If there is a place of respite and resistance from the transparent eye that divides witness and witnessed, perhaps it is in those “obscure actions”⁸³ that cannot truly be pinned by the “eye-beam’s point,”⁸⁴ or printed on a page.

⁸¹ Charlton T. Lewis and Charles Short, *A Latin Dictionary. Founded on Andrews' edition of Freund's Latin dictionary* (Oxford: Clarendon Press. 1879), s.v. “clarus.”

⁸² Cowley, 278.

⁸³ Cavendish, x.

⁸⁴ Cowley, 277.

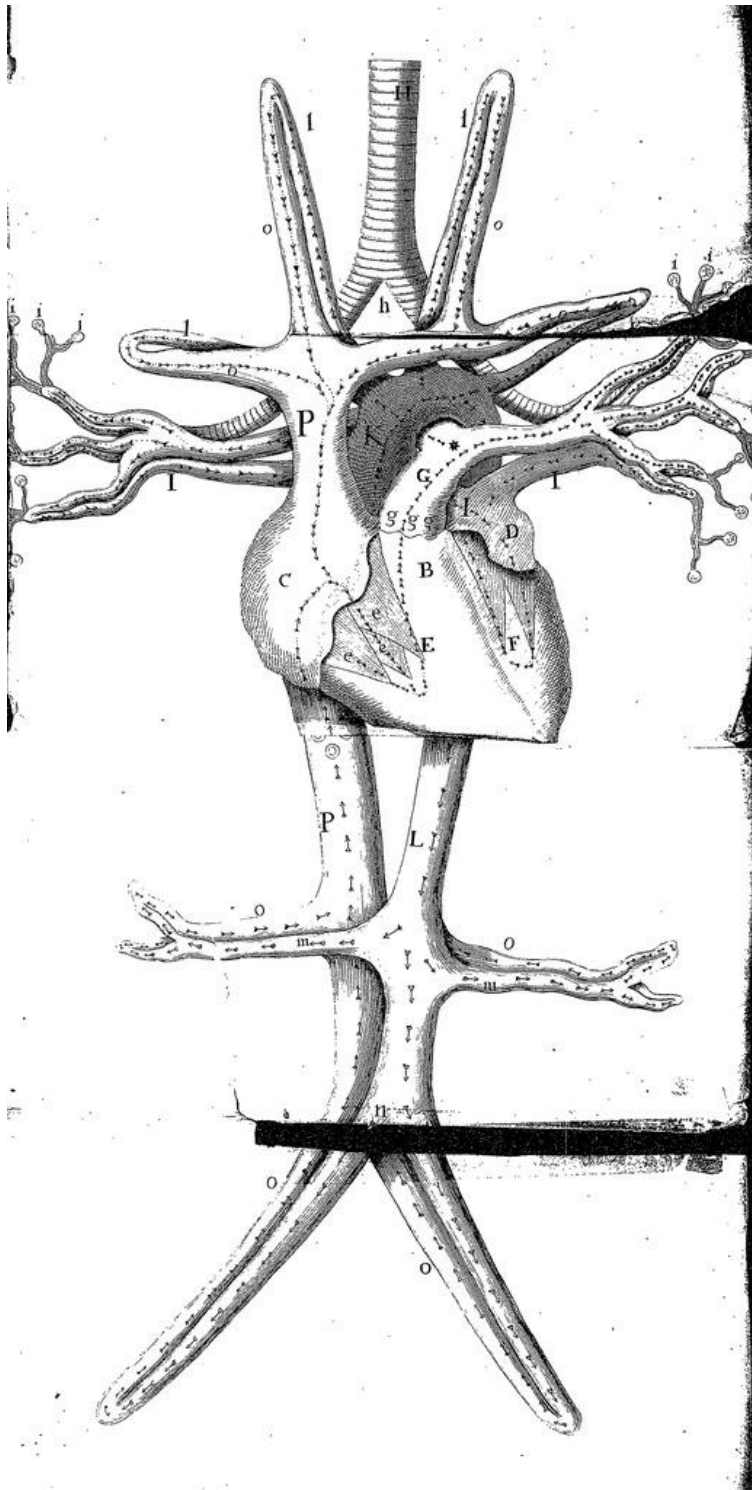


Figure 9: Fold-out illustration from the pamphlet accompanying the exhibition of Rackstrow's automaton, representing the figure's heart and the circulation of blood through it. In *An Explanation of the Figure of Anatomy*, 16.

CHAPTER 3

Sex in the Age of Mechanical Reproduction

As I contended in the previous chapter, the project of representing embodied subjectivity in text was one frequently marked by violence for the artificial women who, like Richardson's *Clarissa*, were apprehended by it. If Richardson, as a novelist of "real life" was often indistinguishable from the rake-philosopher, and if the fictions he produced were thus, in many ways, inherently perverse, what are the implications for a text whose author perverted the realist novel? This text—John Cleland's *Memoirs of a Woman of Pleasure*, commonly labeled the first original work of pornographic prose fiction in English—gleefully repurposes the formal methods of Richardson's epistolary narratives to represent a harlot's progress through midcentury London.¹ In this chapter I offer a new reading of Cleland's work that extends my inquiry into the relationship between gender and technology in the eighteenth century. By foregrounding how the *Memoirs'* representations of gendered bodies and sexuality are inseparable from the technologies of textual production that translate subjectivity into written letters and printed book-objects, this chapter rethinks what it means to pervert the body of text.

The body in Cleland's text is frequently described as technological: among the many metaphors for erect penises that pepper the work, "machine" is among the most

¹ As I will discuss in more detail later in the chapter, the text has often been identified as an emulation, parody, critique, and/or pornographic version of *Pamela*: see, for example, Carol Houlihan Flynn, "What Fanny Felt: The Pains of Compliance in *Memoirs of a Woman of Pleasure*," *Studies in the Novel* 19, no. 3 (1987): 284-295, <http://www.jstor.org/stable/29532508>; Ann Louise Kibbie, "Sentimental Properties: *Pamela* and *Memoirs of a Woman of Pleasure*," *ELH* 58, no. 3 (1991): 561-577, <http://www.jstor.org/stable/2873456>; and Andrea Haslanger, "What Happens When Pornography Ends In Marriage: The Uniformity of Pleasure in *Fanny Hill*," *ELH* 78, no. 1 (2011): 163-188, <http://www.jstor.org/stable/41236538>.

prevalent, and is certainly one of the most striking. As she loses her virginity, it is at the mercy of Charles's "terrible spit-fire machine" that Fanny is put to "such intolerable pain, from the separation of the sides of that soft passage by a hard thick body" that she finally loses consciousness and "stream[s] blood...from the wounded torn passage";² later, with his "monstrous machine," Will "triumph[s] over a second kind of maidenhead" by stretching Fanny's vagina "to its utmost bearing," leaving her "sensible at once to the ravishing pleasure of the *feel*, and the pain of the distension," and, once again, oozing blood (74-76). As these passages demonstrate, the machine-penis is a key image in Cleland's depiction of sex as a practice that produces pain and pleasure in extreme and inextricable ways; critics such as Leo Braudy, Andrew Elfenbein, and Elizabeth Kubek have linked these representations to materialist theories of embodiment, the body's increasingly strict management under capitalism, and the uncanny Lacanian phallus.³ Of the few critics who have seriously considered the text's epistolarity, however, none have recognized the relationship between the *Memoirs*' mechanized bodies and the technologies of textual production that reproduce the body on paper—a relationship that I will argue is central to the work's eroticism, and its violence. By attending to the writing body, and the printed one, in my analysis of the *Memoirs*' mechanized representations of

² John Cleland, *Memoirs of a Woman of Pleasure*, ed. Peter Sabor (1748-49; Oxford: Oxford University Press, 2008), 40-45. References are to this edition.

³ See Braudy, "Fanny Hill and Materialism," *Eighteenth-Century Studies* 4, no. 1 (1970): 21-40, <http://www.jstor.org/stable/2737611>; Elfenbein, "The Management of Pleasure in *Memoirs of a Woman of Pleasure*," in *Launching Fanny Hill: Essays on the Novel and its Influences*, ed. Patsy S. Fowler and Alan Jackson (New York: AMS Press, 2003), 27-48; and Kubek, "The Man Machine: Horror and the Phallus in *Memoirs of a Woman of Pleasure*," in *Launching Fanny Hill: Essays on the Novel and its Influences*, ed. Patsy S. Fowler and Alan Jackson (New York: AMS Press, 2003), 173-198.

subjectivity and embodiment, I explore how the text's technologies refuse and exceed binary definitions of gender—and, finally, reaffirm them.

Present-tense sensations

First, I will establish that the *Memoirs*' epistolary form is an essential part of its pornographic representations. The text's opening sentence signals this intimacy between eroticism and epistolarity: "MADAM, I sit down to give you an undeniable proof of my considering your desires as indispensable orders," Fanny Hill begins (1). This statement performs a complex process of orientation. As it generates the text's narrator, it situates her in relation to her addressee, the anonymous woman whose inexorable wanting will be answered with the "undeniable proof" that Fanny's letter delivers. Implicitly, the opening statement also situates her in relation to the reader who holds a printed version of this fictional exchange. Andrea Haslanger notes that this work of orientation highlights the way in which the "first-person voice" is "a position that is always constituted in relation," not only to the letter's recipient, but "to a set of social conditions" and "a framework of narrative conventions."⁴ Yet the *Memoirs*' opening sentence accomplishes a more prosaic kind of orientation, too: that of a body that sits down at a desk, picks up a pen, and begins to write. As the relative dearth of criticism on the *Memoirs*' epistolary form indicates, the writing body that declares "I sit down" is an easily overlooked presence in Cleland's text.⁵ Philip Simmons, for one, argues that "except at the opening and closing of each of

⁴ Haslanger, 168.

⁵ While Robert Markley, Philip Simmons, Ann Louise Kibbie, and Brian McCord, and Andrea Haslanger have discussed the *Memoirs*' epistolarity, their work on the subject is limited to brief reflections that remain subordinate to larger arguments on other topics. Julia Epstein's "Fanny's Fanny: Epistolarity, Eroticism,

the two letters, all signs of Fanny's correspondent disappear from the text," and thus, outside of these brief instances, "[t]he fact that the narrative pretends to be a letter ceases to be of much importance."⁶ The recurring turns the narrator makes to directly address "Madam," the letters' recipient, however, belie Simmons's assertion that the novel's epistolarity is merely a flimsily constructed framing device.⁷ More importantly, the writing body that declares "I sit down" surfaces regularly during moments of extreme erotic intensity, in which Fanny abandons the method of past-tense description that characterizes the bulk of her story and slips, irregularly, into a mode of present tense narration that reproduces Richardson's famous technique of "writing to the moment." Witness, for example, Fanny's account of her defloration, in which she describes how

He now resumes his attempts in more form: first he put one of the pillows under me, to give the blank of his aim a more favourable elevation, and another under

and the Transsexual Text," in *Writing the Female Voice: Essays on Epistolary Literature* ed. Elizabeth C. Goldsmith (Boston: Northeastern University Press, 1989), remains the only article-length consideration of the text's epistolary form. Like me, Epstein sees the novel's epistolarity as importantly bound up with its eroticism; unlike me, she believes this eroticism is characterized by a "homoerotic phallocentrism" through which the narrator's subjectivity is ultimately "appropriated by male self-celebration" (148). See also Markley, "Language, Power, and Sexuality in Cleland's *Fanny Hill*," *Philological Quarterly* 63, no. 3 (1984): 343-356; Simmons, "John Cleland's *Memoirs of a Woman of Pleasure*: Literary Voyeurism and the Techniques of Novelistic Transgression," *Eighteenth-Century Fiction* 3, no 1 (1990): 43-63, doi: 10.1353/ecf.1990.0047; Kibbie, "Sentimental Properties"; McCord, "'Charming and Wholesome Literature': *Fanny Hill* and the Legal 'Production of Production,'" in *Launching Fanny Hill: Essays on the Novel and its Influences*, ed. Patsy S. Fowler and Alan Jackson (New York: AMS Press, 2003), 267-285; and Haslanger, "When Pornography Ends In Marriage."

⁶ Simmons, 53.

⁷ See, for example, how, when describing her "rigging-out" by Mrs. Brown, Fanny writes, "Imagine to yourself, madam, how my little coquet-heart flutter'd with joy at the sight of a white lute-string, flowered with silver, scoured indeed, but past on me for spick-and-span new, a *Brussels*-lace cap, braided shoes, and the rest in proportion" (13). As she introduces Charles, Fanny urges, "Figure to yourself, *Madam*, a fair stripling, between eighteen and nineteen, with his head reclin'd on one of the sides of the chair, his hair in disorder'd curls, irregularly shading a face, on which all the roseate bloom of youth, and all the manly graces inspired to fix my eyes and heart" (34). After her account of her liaison with Will, Fanny notes that "here, *Madam*, I ought perhaps to make you an apology for this minute detail of things, that dwelt so strongly upon my memory after so *deep* an impression" (83-84). In addition to these moments of direct address to "Madam," there are countless moments in the narrative in which Fanny speaks to a nonspecific "you," addressing the acknowledged recipient of the letter as well as, implicitly, the broader audience of the published text.

my head, in ease of it: then spreading my thighs, and placing himself standing between them, made them rest upon his hips: applying then the point of his machine to the slit, into which he sought entrance.... *He looks, he feels and satisfies himself*; then driving forward with fury, *its prodigious stiffness thus impacted, wedge-like, breaks the union of those parts*, and gain'd him just the insertion of the tip of it, lip-deep; which being sensible of, *he improves his advantage, and following well his stroke, in a straight line, forcibly deepens his penetration...* (40-41, italics mine)

As the italicized phrases demonstrate, a present-tense voice breaks in on this ostensibly past-tense narration with increasing frequency as the sexual act escalates towards its climax. Later, as Fanny recounts her liaison with the impressively endowed messenger boy Will, her narration of the critical moment of penetration implements the same kind of unstable movement between the past and the present tense:

he proceeded afresh to cleave and open to himself an entire entry into me...*redoubling then the active energy of his thrusts, favoured by the fervent appetancy of my motions, the soft oil'd wards can no longer stand so effectual a picklock, but yield, and open him an entrance: and now with conspiring nature, and my industry, strong to aid him, he pierces, penetrates, and at length, winning his way inch by inch, gets entirely in, and finally, a home-mode thrust, sheaths it up to the guard...*the eyes of the transported youth sparkled with more joyous fires, and all his looks and motions acknowledg'd excess of pleasure, which I now began to share, for I felt him in my very vitals! (75, italics mine)

Here, likewise, the critical moment of penetration is voiced in a long passage of present-tense narration nested in the otherwise past-tense description of the encounter. This inconsistent mode of narration similarly characterizes Fanny's encounter with the anonymous sailor, an assignation that supplies the sexual excitement she despairs of in her contracted relationship with Mr. Norbert:

still things did not jee to his thorough liking: changing then in a trice his system of battery, *he leads me to the table, and with a master-hand lays my head down on the edge of it, and with the other canting up my petticoat and shift, bares my naked posteriors to his blind, and furious guide: it forces his way between*

them...he fix'd it right, and driving it up with a delicious stiffness, made all foam again...(141, italics mine)

The text's most evocative slippage from a narrative mode of remembrance to one of experiential immediacy, however, occurs when Fanny describes, near the end of the text, her reunion with the beloved Charles:

I receiv'd his urgent insistence for admission, where that insistence was alone so engrossing a pleasure, that it made me inconsistently suffer a much dearer one to be kept out; but how sweet to correct such a mistake! *my thighs now obedient to the intimations of love and nature, gladly disclose, and with a ready submission resign up the soft gateway to entrance at pleasure: I see! I feel! the delicious velvet tip!—he enters might and main with—oh!—my pen drops from me here in the extasy now present to my faithful memory!* (183, italics mine)

Here, the appearance of the present-tense voice is explicitly linked to its narrator, the writing Fanny, whose erotic pleasure interrupts her written recollections. Fanny's orgasmic exclamation, like the other instances of present-tense narration quoted above, confronts readers with a writing body in the process of fabricating a textual account of its experiences.

As Julia Epstein recognizes, in Cleland's text "letter writing mirrors and projects not just abstract sexuality, but *concrete* sexual pleasure itself... 'Writing it down' means literally that: propelled by desire, writing reenacts, releases, and retracts sexual tension."⁸ Yet, while Epstein classifies the *Memoirs*' epistolary mode as "retrospective," the episodes during which Fanny's narrative breaks from a perspective of distance to inhabit one of contiguity offer the work's most charged reflections on the functions of epistolarity within the pornographic text. In these recurrent moments, the present-tense

⁸ Epstein, 139.

voice's emergence indicates that the narrator who sits down at her desk is as important to the text as the character whose experiences she describes there. This writing body is not, as Simmons suggests, simply a convenient framing device for the *Memoirs*' narrative; neither does it merely transcribe its past experiences. Rather, in these moments, the epistolary narrator's body becomes a principal participant in the sexual experiences it relates. As Kathleen Lubey observes, analyzing the moment when Fanny drops her pen, "[r]ather than parody Richardson's style, Cleland here imitates the earnestness with which it reveals Fanny's transport, not in response to sex, but in response to *imagining* sex";⁹ I would add that this imagining's context in a scene of writing is key to its meaning. By bringing Fanny's writing body into focus as she describes a number of powerfully erotic experiences, Cleland demonstrates that the material processes of epistolarity do more than simply frame his text's representations of sexual pleasure: rather, they activate and sustain them. While Robert Markley remarks that Cleland's narrative illustrates the ways in which "describing, or writing, or reading about sex can...become a form of sexual pleasure,"¹⁰ I believe that the text's engagement with the processes of epistolary production is more specific and more intense. The final, extreme moment of "extasy" with Charles foregrounds the extent to which it is the pen that the writing Fanny grips in her hand, rather than the remembered penetration she uses it to represent, which creates—and finally, as she drops it, satisfies—her sexual desire. In such episodes, the mechanical penises that seemingly produce the narrative's most profoundly

⁹ Kathleen Lubey, *Excitable Imaginations: Eroticism and Reading in Britain, 1660-1760* (Lewisburg: Bucknell University Press, 2012), 185.

¹⁰ Markley, 350-51.

felt sexual experiences find an analogue in the technology of textual production—namely, the pen—that actually generates them.

Taking up the pen

A similar kind of eroticism characterizes the relationship between the writing body and its instrument in the private correspondence of epistolarity's most famous eighteenth-century proponent: Samuel Richardson. Writing a letter to Sophia Westcomb in 1746, Richardson explains that "one of the felicities that give a preference to familiar correspondencies" is

that they may be carried on, and best carried on, at the retired hour, either morning or evening, before needful avocations take place, or after they have been answered. For the pen is jealous of company. It expects, as I may say, to engross the writer's whole self; every body allows the writer to withdraw: it disdains company; and will have the entire attention.¹¹

While, elsewhere, Richardson's letter celebrates the ability of epistolary exchange to "[bring] back to sweet remembrance all the delights of presence" for distant friends, here he reveals how much the act of composing a letter replaces (or, more accurately, supplants) the addressee by providing more pleasure than her or his presence ever could. For, as Richardson makes clear, it is the pen, rather than the letter's recipient, that "engross[es] the writer's whole self" during the private moments he devotes to writing. Like the gratification Fanny finds in writing her letters, the solitary pleasure Richardson describes finding with his pen has an unmistakably masturbatory quality. Further, his

¹¹ Richardson to Sophia Westcomb (undated), in *The Correspondence of Samuel Richardson*, ed. Anna Laetitia Barbauld (London: Richard Phillips, 1804), 3:246-47.

account of a man who satisfies himself by manipulating a mechanical instrument performs the same kind of implicit substitution of pen for penis that Fanny's epistolary narrative accomplishes. The suggestion thereby encoded in Richardson's passage—that the pen brings pleasure to the writer not by replacing another's body, but by becoming a supplemental, sexual part of the writer's *own* body—alerts us to ways of reading Fanny's relationship with her pen that move beyond seeing it as merely a dildo-like substitution for an absent partner. As Richardson's letter hints, an important part of the eroticism inherent in writing lies in the process through which a body and a pen become a writing body: a penman.

The process whereby pens became one of the instruments that, as Park puts it, “bridge[d] the organic and the mechanical parts of bodily being”¹² during the eighteenth century is represented not only in the fiction and letters of epistolary writers like Cleland and Richardson, but also by the writing masters and other would-be experts who published a glut of penmanship manuals over the course of the century. These instructional texts offer their own accounts of the processes that worked to bond the body and the pen into a new system. In 1747's *The Universal Library of Trade and Commerce* a “most Celebrated MASTER” of the art of penmanship voices a common refrain when he explains that “The first Thing necessary” when teaching someone to write correctly is “to direct him how to hold his Pen.”¹³ Nearly every eighteenth-century penmanship manual includes instructions—so exhaustively detailed that they fill multiple pages—for

¹² Park, xxviii.

¹³ *The Universal Library of Trade and Commerce* (London: J. Robinson, 1747), 1, ECCO (CW3305045293).

holding the pen properly. This process receives so much attention because the particular qualities of the relationship between the pen and the writing body determine the kind of text the penman is able to produce. Robert More explains, in his 1716 essay, *Of the First Invention of Writing*, that

There are an abundance of Difficulties in well Forming and Finishing a Letter. The too hard Leaning on the Arm in Writing, takes from the Freedom of the Writer. The more or less Touch of the Nib of the Pen at the Side of the Thumb, or Fingers, alters the Stroke. The more or less Inclination of the Hand, renders the Stroke quite different. The quick or slow Motion of the Fingers of the Arm Enlivens, or makes a Stroke Feint. The Pen too hard or too soft, or not fitted to the Hand, interrupts the Spirit and Power of the Action.¹⁴

As More and others make clear, the process of learning to write is about more than simply forming letters. In order to be successful, the writer's education must ensure that she or he achieves an extraordinarily high level of integration between pen and body; this success is measured in the "Freedom" of the writing process, and the "Spirit" and "Power" of the text it yields. A short excerpt from *Writing Improv'd, or Penmanship Made Easy*, published in 1730, gives a sense of the painstaking ways in which the penman's education strove to mutually calibrate the writer's body and the writing implement:

Hold your PEN between the two *Fore-fingers*, extended almost straight, and the *Thumb* bending a little outward, and in your *Right-Hand*, with the Hollow side of the PEN downwards, and the *Nib* flat upon the PAPER: Let it rest between the two upper joynts of the Fore-Finger, and upon the End of the Middle One, about an Inch from the *Nib* of the PEN, the Ends of the little Finger, and that which is next to it, bend in towards the Palm of the Hand, about half an Inch distant from the End of the Middle Finger.¹⁵

¹⁴ Robert More, *Of the First Invention of Writing, An Essay, Compendiously Treating of the Whole Art* (London: Barnes et. al, 1716), 8, ECCO (CW3316161317).

¹⁵ John Clark, *Writing Improv'd or Penmanship Made Easy in its Useful and Ornamental Parts: with Various Examples of all the Hands now Practis'd in Great Britain* (London: John Clark, 1730), 2, ECCO (CW3313788134).

The outcome of this meticulous process is the ability to “let your Hand move with an easy Motion, and without Hurry, performing as much with the continued motion of your PEN, as you possibly can, without straining or carrying it beyond what you can Command with Freedom and Ease”; in short, to “write a Good *Hand* with great Expedition, and Pleasure.”¹⁶ In this description of ideal penmanship, the motion of the writer’s hand and the motion of the pen are pleasingly inextricable as they join to form the organ that produces the “*Hand*,” or written text. Joining the body as a supplemental part, the pen becomes organic as the body becomes technological.

In the manuals, the hand is not the only body part with which the pen exhibits an identification. “As by words we convey our Thoughts to one another,” writes the author of *The Universal Library of Trade and Commerce*, “so by Writing we represent to the Eye those Words which we pronounce,” and so “The Tongue and the Pen are mutual assistants to each other.”¹⁷ Robert More likewise explains that “the *Tongue* and *Pen* do mutually correspond and assist each other, *Writing* what we *Speak* and *Speaking* what we *Write*...So that Writing is a literal Supplement of the Voice.”¹⁸ The author of *The Art of Writing*, published in 1746, again focuses on the relationship between the tongue and the pen in his assessment of the value of writing:

By this artful Invention, we are enabled to correspond, and hold Converse with our absent Friends, and to communicate with Freedom and Ease all the secret Sentiments of our Souls, let our Distance from them be never so remote. The Tongue, which is the principal Instrument, and Organ of Speech, has no Manner of Share in this agreeable Commerce. The PEN, directed by Practice to draw

¹⁶ Clark, *Writing Improv’d*, 6.

¹⁷ *Universal Library of Trade and Commerce*, 1.

¹⁸ More, 1.

intelligible Characters upon Paper, aids and assists it, (mute as it is) is its unerring Interpreter, and becomes in its stead the Vehicle of Discourse.¹⁹

In this description, the tongue (as “Instrument”) becomes pen-like as much as the pen becomes tongue-like. Further, by superseding the muted tongue, the pen becomes an “Instrument, and Organ” of the body itself. These descriptions of the pen’s relationship with the writer’s body frame the implement as an “objectifying resource” both similar to and different from the instruments that artificially extended the philosopher’s physical capacities. Rather than deciphering the natural world, the pen makes subjectivity visible on the page, transforming the soul’s secret sentiments into intelligible characters. This instrument is an artificial extension of the body, one that objectifies interiority as it fashions the self into a legible thing. As it does so, the pen mirrors, and is mirrored by, the body it augments.

The specific qualities the manuals assign to the pen further illuminate Cleland’s eroticized representations of the writing body in *Memoirs of a Woman of Pleasure*. See, for example, the comprehensive instructions William Leekey, “Writing-Master,” offers his readers in the process of “mak[ing] a good PEN”:

If the *Quil* is *weak*, the *Slit* must be the *shorter*; if *strong*, it matters not how *long*, the *Cheeks* being made in *proportion*: So that if *used* by an *obedient Hand*, it hath a *Spring*, and *opens* and *shuts* at *pleasure*, as is evident in *Striking*, or *Command of Hand*...Care must be taken that the *Slit* is not *forced* so *hard* as to *gape* or *open*; neither should the *Nib* be bent inwards; both these *Failings* tending to the same *bad End*: The *first* causes the *Pen* not to *cast* the *Ink*; the other, after very little *Use*, occasions a double *Stroke*; and when the *Nib* is recovered from that *forced Strain*, the *Slit* opens not much *unlike* that which was *forced* too *much*. The *Slit*

¹⁹ *The Art of Writing, Illustrated with Copper-Plates* (London: J. Newbery, 1746), 8, ECCO (CW3311180638).

should always be *easy* and *clear*, so that when *nibbed* as I shall *shew*, you may *write* with the *Ease* and *Freedom* of a MASTER of WRITING.²⁰

The prepared quill pen, with its “*Cheeks*” and “*Slit*,” resembles both the mouth that it replaces as an expressive organ, and the vagina, another orifice that “*opens* and *shuts* at *pleasure*.” In *The Art of Writing*, this likeness again surfaces as the author guides the pen-maker to “hold the Quill...with the Barrel of it towards you; and the Belly of it upwards” and “open the belly of the Barrel of the Quill with a Cut” in order to “enter a small Slit with the Edge of your Penknife.”²¹ These excerpts demonstrate that the pen, as it is incorporated into the penman to produce the writing body, remains an ambiguously defined organ, neither male nor female. In making this assertion, I seek to complicate the easy identification of the pen as a “metaphorical penis” that Sandra Gilbert and Susan Gubar, among many others, have canonized.²² While the pen can (and frequently does) exhibit some of the characteristics and functions of the penis, the sources I have discussed above indicate that it often takes on a much more complex and unfixed kind of signification in relation to the body that manipulates it. This unfixed nature characterizes the physical qualities of the pen itself, which penmanship manuals demonstrate is not simply a phallic instrument, but instead one that depends on a vaginal slit for expressiveness.²³ While the pen becomes a sexualized—even genital—part of the

²⁰ William Leekey, *A Discourse on the Use of the Pen. Containing Observations on Writing in General, the Proper Posture in Sitting to Write, Rules for Choosing Quills, and Making of Pens for Different Hands...With Whatever Else may Tend to Perfection in that Art* (London: M. Cooper, 1744), 23-24, ECCO (CW3319787647).

²¹ *The Art of Writing*, 25-26.

²² Sandra M. Gilbert and Susan Gubar, *The Madwoman in the Attic: The Woman Writer and the Nineteenth-Century Literary Imagination* (New Haven: Yale University Press, 1979), 3.

²³ The pen’s slit may also recall the slit at the head of the penis, a detail that reinforces the instrument’s unfixed, ambiguous bodily identifications. The way this “small slit” wavers between its identification with

penman's body, it is not an organ that behaves according to the clearly divided two-sex model of gender identity that, as Thomas Laqueur has argued, gained medical and popular ground over the course of the eighteenth century.²⁴ As a result, though the figure of the penman might seem, both etymologically and conceptually, straightforwardly male, the equivocal qualities of the pen itself, along with the ambiguous way in which this instrument functions as a sexualized supplemental part of the writer's body, indicate that the writing body has a complex and potentially unstable relationship to categories of gender.

While the manuals describe the process of becoming a penman as pleasurable, it is also unmistakably violent. This violence, limned in the descriptions above of "slitting" the pen with a knife, finds a clearer voice in the "humorous Encomium on the GOOSE-QUILL" included as part of the prefatory material to *The Art of Writing*. In this bit of doggerel, a former feather relates the pen-making procedure it endured:

My Skin he flay'd, my Hair he cropp'd,
At Head and Foot my Body lopp'd.
And then, with Heart more hard than Stone,
He pick'd my Marrow from the Bone.
To vex me more, he took a Freak,
To slit my Tongue, and make me speak...²⁵

The goose quill, now it-narrator (we could call him a pen man) recounts the excruciating process of being shaped into an object of discourse, echoing the program of bodily discipline the penmanship manual's reader is soon to undergo. We might here recall

mouth, penis, and vagina likewise complicates associations of female genitalia with lack or emptiness, and of female expression with modest silence.

²⁴ See Laqueur, *Making Sex: Body and Gender from the Greeks to Freud* (Cambridge: Harvard University Press, 1990).

²⁵ *The Art of Writing*, 17.

Foucault's delineation of how, during the seventeenth and eighteenth centuries, "an art of the human body was born," one focused "not only at the growth of its skills, nor at the intensification of its subjection, but at the formation of a relation that in its mechanism itself makes it more obedient as it becomes more useful, and conversely."²⁶ One of Foucault's examples of this disciplinary process is penmanship: "[g]ood handwriting," he observes, "presupposes a gymnastics—a whole routine whose rigorous code invests the body in its entirety, from the points of its feet to the tip of its index finger" in the service of "an efficient gesture."²⁷ In *Writing Matter*, Jonathan Goldberg extends Foucault's account of penmanship, arguing that the process of creating a writing body is, fundamentally, a painful one. Through analyses of sixteenth- and seventeenth-century writing manuals, Goldberg asserts that penmanship is the product of "pedagogic regimes that socialize the hand and make the hand human by inserting it within the act of writing."²⁸ Like the anonymous author of the goose-quill's narration, Goldberg finds the violence of these regimes at the origin of the scene of writing, in "the knife that must be to hand and sharp if script is to be produced" (65-66). Since writing "begins with a tool of violence," and renders "the point of the quill...another cutting edge" (74), the writer is simultaneously master of the quill and mastered by the violent processes that fashion pen and penman into a functional system.

²⁶ Michel Foucault, *Discipline and Punish: The Birth of the Prison*, 2nd ed., trans. Alan Sheridan (New York: Vintage, 1995), 137-138.

²⁷ Foucault, *Discipline and Punish*, 152.

²⁸ Jonathan Goldberg, *Writing Matter: From the Hands of the English Renaissance* (Stanford: Stanford University Press, 1990), 91. References are to this edition.

Foucault and Goldberg’s accounts of penmanship’s disciplinary structure bespeak the pains through which the subject is transformed into an instrument of discourse. Recalling the literal and conceptual projects of autopsy discussed in the previous chapter, this epistolary subject is made visible in print through a violent process of technological objectification. As I noted above, however, while the penmanship manuals do articulate this disciplinary project, they frequently turn to comment on the pleasures that issue from and exceed it as the penman becomes a “MASTER of WRITING”—an identity that offers “*Ease and Freedom*” as it engrosses the whole self. If we attend to these spaces of excess, we can see that the process of creating a penman does more than make a meticulously controlled, technological body. This work of refashioning the body in relation to its artificial parts brings it into an ambiguous relationship with them, and with the parts of the body they emulate, extend, and replace. This space of ambiguity enables an unfixed play that turns away from discipline to find pleasure.²⁹ It is at this complicated nexus of violence and pleasure that *The Memoirs of a Woman of Pleasure* operates, and by examining a scene that Cleland’s text marks as particularly brutal, I will explore the ways in which Foucault and Goldberg’s analyses are both appropriate for and inadequate to an account of eighteenth-century epistolary practices.

²⁹ The *OED* cites the Middle French *pervertir* (“to turn away from the right course”) as the etymological root of the verb “to pervert.” See the *Oxford English Dictionary Online*, s.v. “pervert, v.,” last modified March 2014, <http://www.oed.com/view/Entry/141685>.

Unstable instruments

It is with apprehension and excitement that Fanny approaches Mr. Barville, a specialty client of Mrs. Cole's who operates "under the tyranny of a cruel taste; that of an ardent desire, not only of being unmercifully whipp'd himself, but of whipping others" (143). Barville pays Mrs. Cole generously to find women who can satisfy his desires, and Fanny—that avid student of both pleasures and novelties—agrees to an attempt, "with a gust of fancy for trying a new experiment" (144).³⁰ In her description of their encounter, Fanny makes much of the unconventionality—even the freakishness—of Barville's desires, and of her distaste for the violence that defines his erotic experience. When examined in the wider context of Fanny's memoir, however, the extremes associated with Barville's "arbitrary tastes" (144) are part of the same continuum of pain and pleasure (and pleasure through pain) as Fanny's own perverse experiences of sexuality—especially her sublime encounters with her deflowerer and "supreme idol," Charles (178). Moreover, Fanny's encounter with Barville, centered as it is around an implement that cuts the flesh with a pain that turns to pleasure, ultimately allegorizes the novel's fascination with sexual experiences mediated and enabled by technological instruments: its fascination, that is, with the erotics of the penman.

At the center of Barville's sexual experience is the rod: in order to become aroused, he must either feel its sting or see to it that another body does. In her

³⁰ Fanny's experimental language here recalls an earlier passage where she describes herself as one "whose natural philosophy all resided in the favourite center of sense [i.e., her vagina], and who was rul'd by its powerful instinct, in taking pleasure by its right handle" (80). Fanny's descriptions seem simultaneously to locate sexual pleasure as a legitimate site of empirical knowledge and to satirically recast experimental science as a system of sexualized self-gratification in a way that recalls Behn's satire on the Royal Society fellows.

descriptions of this fetish, Fanny anchors its disciplinary qualities in a pedagogic context, writing that Barville “was unaccountably condemn’d to have his pleasure lash’d into him, as boys have their learning” (145). Fanny’s evocation of the schoolmaster’s rod echoes an earlier scene in the text: her liaison with Will, in which she describes how she directed his first sexual experience. Fanny recalls that Will’s initial attempts to penetrate her

were untoward enough, for his machine meeting with no inlet, bore and batter’d stiffly against me in random pushes, now above, now below, now beside his point, till burning with impatience from its irritating touches, I guided gently with my hand, this furious fescue, to *where* my young novice was now to be taught his first lesson of pleasure... (73)

Peter Sabor’s note explains that a fescue was “a slender rod, used for pointing out letters to children learning to read” (73n2). In the wider context of Cleland’s text, Barville’s rod is thus linked to violent pedagogic discipline, to instruction in the comprehension—and, implicitly, the production—of written text, and to the penis as machine-object. Indeed, the rod, as a disciplinary sexual instrument, does produce an unexpected kind of text: after whipping Barville, Fanny is

amaz’d...on viewing the skin of his butcher’d, mangl’d posteriors, late so white, smooth, and polished, now all one side of them, a confuse’d cut-work of weals, livid flesh, gashes and gore, insomuch that when he stood up, he could scarce walk....(148)

Like the machine-penises Fanny encounters with terror and delight, the rod produces “bloody characters” (138) that cover her skin with the marks of violent pleasure. The “cut-work” of the rod is of a kind with the “stream of blood, that flow’d from the wounded torn passage” and covered the sheets upon Fanny’s defloration (41). It is also of a kind with the ink she uses to inscribe these experiences onto sheets of paper. Like the pen, then, the rod is at once a producer of text, a disciplinary tool, and an implement of

pleasure. Fanny's description of her encounter with Will hints at further qualities the rod shares with the instrument of writing. Reading Fanny's account, we can see that though the "fescue" she refers to is Will's penis, it is Fanny, not Will, who wields it by pointing it "to *where* my young novice was now to be taught his first lesson of pleasure" (73). In Fanny's metaphoric scenario, she is the schoolmaster and Will is the student; therefore, she is the one with the ability to apply the rod for the novice's instruction (or, implicitly, for his punishment). Thus, for a moment, Fanny's figurative prose performs the deft trick of detaching Will's penis and claiming it as her own instrument, and her pleasure in their coupling comes briefly to resemble the self-contained, masturbatory thrills of manipulating a pen.³¹

The unfixed nature of the rod briefly intimated in Fanny's description of Will's sexual education becomes a central aspect of her account of her experiences with Barville. One of the most striking aspects of her initial description of the naked Barville is her appraisal of his sexual parts: she notes that his flaccid penis "seem'd almost shrunk into his belly, scarce showing its tip above the sprout of hairy curls that cloath'd those parts, as you may have seen a wren peep its head out of the grass" (146). Fanny's description of Barville's genitalia echoes her account, at the beginning of the text, of her inexperienced disappointment in finding the "spreading thicket of bushy curls" (12) that covers Phoebe's groin hides "not even the shadow of what I wanted" (34). As Barville lies on the

³¹ Fanny's dual position as the fescue's subject and master in this scene can also be linked to the novel's representations of its heroine's education. Fanny, the character who participates in this scene, has received a "very vulgar" education through which she learned only "an illegible scrawl" (2), while Fanny, the epistolary narrator who composes this scene, has had the benefit of more extensive instruction from her final client, the "rational pleasurer," who has "pushed" her skill to "the degree of improvement you see it at" (175).

bench before Fanny, her sketch of his “back-view” continues in a similar manner: she describes “a pair of chubby, smooth-cheek’d, and passing white posteriors” which “rose cushioning upwards from two stout, fleshful thighs, and ending in their cleft, or separation, by an union at the small of the back” (146). Again, Fanny’s description recalls an earlier passage in the text, one in which she observes Polly’s assignation with the Genoese merchant in Mrs. Brown’s establishment, recounting that Polly’s “delicious tract of belly...terminated in a parting or rift scarce discernable, that modestly seem’d to retire downwards, and seek shelter between two plump fleshy thighs” (29). Fanny’s description of Barvile bluntly indicates that, stripped of his clothes, his sexual parts resemble those of a woman. As Barvile lies before her, it is Fanny—rod in hand—who becomes the sexual aggressor, striking her partner with a series of lashes that “cut...such livid weals, as the blood either spun out from, or stood in large drops on” his flesh (147). This image of Fanny whipping Barvile enacts a reversal of the *Memoirs*’ iconic scenes of painful sexual ecstasy, in which Fanny lies prone and at the mercy of a machine-penis that draws blood and rapture from her in equal measures; instead, Fanny becomes, for Barvile, “the instrument” of both “his suffering” and his “strange pleasure” (147-48). That Fanny identifies herself as the “instrument” of Barvile’s suffering indicates that her body and the rod it wields are, in the sexual act, indistinguishable. Fanny’s liaison with Barvile draws out the implications of her control over the “fescue” in her encounter with Will: like the pen, the rod is able to become a sexualized supplemental organ, a true—if temporary—extension of her own body. As Fanny and the instrument are joined, her body is rewritten as the master of this scene of violent sexual pleasure.

Fanny's descriptions of Barville during their meeting further advance the consonances between the pen, the rod, and the penis. As the descriptions of his genitalia quoted in the previous paragraph indicate, Fanny is initially unimpressed by Barville's endowment. In the midst of the lashing Fanny dispenses, however, she notices him "wreathing and twisting his body" in a manner that she "could plainly perceive was not the effect of pain, but of some new and powerful sensation" (147) and is subsequently surprised to discover that

that machine of his, which I had by its appearance, taken for an impalpable, or at best a diminutive subject, was now, in virtue of all that smart and havock of his skin behind, grown not only to a prodigious stiffness of erection, but to a size that frightened even me: a non-pareil of thickness indeed!³² (147)

The fact that Barville's genitalia rapidly transforms from the feminized "impalpable" of Fanny's initial description to a terrifying "machine" of the kind that figures in her most ecstatic sexual experiences suggests that the machine-penis is—like the pen or the rod—an unfixed supplement, an instrumental object able to be taken up, cast off, and even transferred from body to body. As the scene continues, these instrumental organs are repeatedly exchanged between Fanny and Barville in an economy of pain and pleasure. After Fanny has "fairly worn out three bundles" of rods on Barville's buttocks, she distinguishes on the bench "the marks of a plenteous effusion of white liquid" and notes that "already had his sluggard member run up to its old nesting place, and ensconced

³² Fanny's description of the size of Barville's erect penis as a "non-pareil of thickness indeed!" develops the link between machine-penis and pedagogic/disciplinary "fescue" through the word's double meaning of "[h]aving no equal" and "[a] size of type (6 points) larger than ruby and smaller than emerald"; the "non-pareil" penis is thus associated with both power and text, just like the schoolmaster's rod. See the *Oxford English Dictionary Online*, s.v. "nonpareil, adj. and n.," last modified June 2014, <http://www.oed.com/view/Entry/128030>.

itself again” (148). Barville then takes up a rod and “twigg[s]” Fanny “so smartly as to fetch blood in more than one lash”; then, as he makes her spread her knees, Fanny recounts how

that tender part of me naturally the province of pleasure, not of pain, came in for its share of suffering, for now...he directed the rod so that the sharp ends of the twig lighted there, so sensibly, that I could not help winching, and writhing my limbs with smart...(149)

Though Fanny initially feels only pain, soon she realizes that “the smart of the lashes was now converted into such prickly heat, such fiery tinglings” that the

itching ardours thus excited in those parts upon which the storm of discipline had principally fallen, detach’d legions of burning, subtile, stimulating spirits, to their opposite spot, and center of assemblage, where their titillation rag’d so furiously, that I was even stinging-mad with them....(151)

In order to achieve satisfaction, however, Fanny must “provoke, and rouse to action”

Barville’s “torpid machine” by “just refreshing the smart of the yet recent, blood-raw cuts” with the rod, which stimulates it into “such a noble size, and distinction” that Fanny fears that she “could not possibly bear” the “admission of that stupendous head” (151).

The scene represents a constantly shifting assemblage of bodies and implements that meet in complex and unpredictable ways. Pain turns to pleasure as Fanny and Barville take up, discard, and pass between them objects that function at once as instruments and sexual organs, suggesting that the true thrill of these supplements is found in their unfixed nature. These supplemental parts are fundamentally ambiguous not only because of their ability to be incorporated into and then released from the body, but because they traverse—and therefore trouble—categories of gender as they move between persons and situations.

The body that incorporates the rod only to discard it, or that wields the machine-penis until an orgasm marks its return to impalpability, echoes the writing body that merges with an instrument only to drop it at the moment it produces its most intense pleasure. In its representation of the economy of pain and pleasure within which these instrumental encounters operate, the story of Mr. Barville acts, as I suggested above, as an allegory for the erotics of epistolary. The scene's violence is organized around a pedagogic disciplinarity; the connections Fanny's description suggests between instructional discipline, lacerated flesh, and textual production reflect Goldberg's observation that both writing instruments and the disciplined bodies that operate them are produced by the pressure of a knife's edge. The "meticulous meshing[s]"³³ of body and instrument Fanny describes, however, exceed Foucault and Goldberg's accounts of the body's subjection within disciplinary systems that coercively fashion its useful docility. In Fanny's *Memoirs*, this disciplinary violence becomes sexual play. Her account of disciplining the body, like those in the early eighteenth-century penmanship manuals, align discipline not simply with punishment, but also with pleasure. Moreover, this pleasure inheres not in a fixed position of dominance or submission, but instead in a shifting economy through which the instruments that enable these positions are incorporated into and then released from the body. As the fluctuating status of Barville's genitalia indicates, this economy is not one in which the female body is able to achieve membership in a category already occupied by the male: rather, it is one within which all

³³ The phrase is taken from Foucault: "Discipline defines each of the relations that the body must have with the object that it manipulates. Between them, it outlines a meticulous meshing" (*Discipline and Punish*, 152).

bodies shift and change in relation to the supplemental parts they encounter and incorporate. Like the ambiguous nature of the pen itself—an implement simultaneously phallic and vaginal—the way these instrumental parts (implicitly linked with the pen) mingle indiscriminately and unpredictably with supposedly distinct bodies alerts us to how the figure of the penman can trouble nascent eighteenth-century categories of gender. The *Memoirs*' notorious perversity perhaps stems less, then, from its explicit depictions of violent sex, and rather from the way its representations of sexual pleasure exceed and unsettle the disciplinary systems meant to produce compliant, coherent bodies.

Felicity Nussbaum agrees that Cleland's text "tolerates a sexual ambiguity not entertained or represented in eighteenth-century science"³⁴ and draws our attention to how Fanny's body "is an *effect* of its multiply gendered anatomical parts that have biological referents but are not synonymous with them or confined to one sexual practice," emphasizing in particular Cleland's representations of Fanny's enlarged and ejaculating clitoris, which "explicitly resembles a penis" (106, 105). Nussbaum notes that in eighteenth-century accounts of sex work, the prostitute often appears "fluidly and ambiguously gendered, since she is a female embodiment; but sexuality itself, of which she is a cultural emblem, is gendered unfeminine" (100). Exceeding the bounds of her assigned gender, the prostitute is "conceptualized...as a species set apart from women"; as Nussbaum observes, the prostitute's unstable relationship with embodiment and sexuality

³⁴ Felicity Nussbaum, *Torrid Zones: Maternity, Sexuality, and Empire in Eighteenth-Century English Narratives* (Baltimore: Johns Hopkins University Press, 1995), 105. References are to this edition.

ultimately adds to her allure, as she “titillates in part by impersonating and thwarting the available gendered categories” (100, 103). Nussbaum’s reading helps to illuminate why Cleland’s eighteenth-century prostitute’s narrative is so deeply concerned with the processes of epistolarity—or, alternately, why his exploration of the pains and pleasures of epistolarity is narrated by a prostitute. Like the prostitute, the penman is “fluidly and ambiguously gendered” (100), a figure possessed of sexual parts that do not necessarily correspond to fixed gender categories, or to the gender identity of the body in which they inhere. As Cleland’s penman-prostitute exceeds these conventional categories, she is initiated into perverse experiences of pleasure and mastery. Fanny Hill emerges from Cleland’s text not only as a participant in the heady erotics of eighteenth-century epistolary fiction, but also as a representation of how subjects disciplined by technological objectification could pervert an instrumentalized body into unstable new configurations, turning away from pain to pleasure, and perhaps even to freedom and ease.

Meeting the press

If considering the relationship between the writer and her pen in *Memoirs of a Woman of Pleasure* reveals that Cleland’s text is deeply concerned with the material processes of epistolarity, attending to how Fanny approaches her narrative’s public life shows that the *Memoirs* is likewise engaged with the practices through which these handwritten documents become printed texts. For, while Fanny’s narrative begins with

the declaration, “I sit down to give you an undeniable proof of my considering your desires as indispensable orders,” the sentence continues:

ungracious then as the task may be, I shall recall to view those scandalous stages of my life, out of which I emerged at length, to the enjoyment of every blessing in the power of love, health, and fortune to bestow. (1)

While Fanny’s narrative is infamously explicit, both volumes of her *Memoirs* open with statements expressing her apprehension about the “ungracious” undertaking of making her story public. At the beginning of the first volume, she allays her anxieties in this regard by explaining to her addressee that she can be “careless of violating those laws of decency that were never made for such unreserved intimacies as ours” (1). Depending for its force on the supposedly private status of epistolary correspondence, this rationalization can only be read ironically from its location on the first page of Cleland’s printed text. Fanny’s protestations at the beginning of the second volume—a narrative moment she marks as one in which she is embarking on a “new stage of my profession” by “passing...from a private devotee of pleasure, into a public one, to become a more general good” (92)—offer a more complicated account of her difficulties. “MADAM,” she begins,

If I have delay’d the sequel of my history, it has been purely to afford myself a little breathing time, not without some hopes that, instead of pressing me to a continuation, you would have acquitted me of the task of pursuing a confession, in the course of which, my self-esteem has so many wounds to sustain. (91)

Fanny’s thwarted hope that her addressee would, by now, have stopped “pressing [her] to a continuation” of her narrative plays on the multiple meanings of the verb “to press.” The principle sense of the word, in this passage, is the act of “urg[ing]” or “insist[ing],” one of a number of meanings that the *Oxford English Dictionary* categorizes as

“[f]igurative senses relating to actions compared to physical pressure.” The other meanings catalogued under this heading, “[t]o affect with a feeling of (physical or mental) pressure, constraint, or distress; to weigh down, burden, oppress (the feelings, mind, etc.)” and “[o]f a tyrant, adverse circumstances, etc.: to oppress; to crush, reduce to distress or misery; to load or burden with impositions or restrictions; to distress, afflict”—meanings now archaic, but current at the time of the *Memoirs*’ publication—indicate that this mode of insistence was inflected with a forcefulness often violent in its severity.³⁵ These demands are linked with eighteenth-century practices of impressment, in which men were forced to enter into military service, and of pressing bodies with stones or other weights in order to extract confessions or execute criminals. Fanny’s explanation that she broke from writing in order to “afford [her]self a little breathing time” represents the pressure she feels from her anonymous correspondent as an analogous kind of physical force. At the same time, “to press” (and even “to press to death”) had, since at least the sixteenth century, maintained the bawdy meaning “to press down in the sexual act.”³⁶ Finally, in another meaning current during the 1740s, though now obsolete, “to press,” and the related verb “to impress,” meant “to print,” or to “make a typographical ‘impression’ of.”³⁷ Fanny’s hope that “MADAM” would stop “pressing”

³⁵ *Oxford English Dictionary Online*, s.vv. “press, v.1.,” last modified September 2014, <http://www.oed.com/view/Entry/150765>; and “press, v.2.,” last modified March 2013, <http://www.oed.com/view/Entry/150843>.

³⁶ Eric Partridge, *Shakespeare’s Bawdy* (London: Routledge, 2001), 215-16. Simmons writes that “To the reader who has just finished the first volume of the book, the *double entendre* of such expressions as “breathing time,” “pressing me to a continuation,” and “wounds” is perfectly clear” (55); he suggests that the passage acts as “a piece of narrative *coquetterie* whose humour sanctions the equation of narration with the sexual act” (55), whereas, recognizing it as a site of multiple *entendres*, I regard the passage as more complex and ambivalent.

³⁷ *Oxford English Dictionary Online*, s.vv. “press, v.1.,” and “impress, v.1.,” last modified December 2014, <http://www.oed.com/view/Entry/92715>.

her “to a continuation” thus collects a dense tangle of significations related to violently forced action, sex, and publication.³⁸ As I have explored, the pleasure Fanny derives from penning her narrative is a crucial part of the novel. It is interesting, therefore, that her worries about the project are first soothed when she reaffirms the text’s epistolarity, but left both heightened and unresolved as they are implicitly linked to the process of transforming her work into a printed volume. The uncomfortable pressure she feels from the injunction to publicize her narrative—a pressure linked, semantically, to both the weight of a sexual partner and the force of typographical machinery—indicates a shift from the erotics of the pen to the erotics of the printing press. Fanny’s inability to catch her breath from under the press further suggests that the pains of publication are more implacable than those the penman is able to turn to pleasures through a perverse economy of unfixity and erotic play.

As Lisa Maruca has shown in *The Work of Print*, the process of producing printed texts was often sexualized in representations circulated across the seventeenth and eighteenth centuries. Examining Joseph Moxon’s 1684 printer’s manual, *Mechanic Exercises on the Whole Art of Printing*,³⁹ Maruca draws to our attention the passages in

³⁸ These interlinked concerns resurface in Cleland’s anonymously published pamphlet *The Case of the Unfortunate Bosavern Penlez* (London: T. Clement, 1749), ECCO (CW3305460759), composed soon after he completed the *Memoirs* and sometimes considered a response to that text. Writing about young women who are forced into prostitution, Cleland laments how such women are indiscriminately “given up” by their pimp “to the lust of every Ruffian who can afford the Price he sets upon her, let his person be never so loathsome and infectious, to be touzed, and rumped, like a Bit of dirty Paper” (9). Cleland’s comparison of the prostitute’s forced sexual publicity to blackened paper suggests that the erotics of “pressing” were an ongoing concern for the author.

³⁹ Moxon’s manual was published under the auspices of the Royal Society as a part of his larger series, *Mechanick Exercises, or, The Doctrine of Handy-Works*, which explored skilled trades such as “Smithing, Founding, Drawing, Joynery, Turning, Engraving, Printing Books and Pictures, Globe and Map-making, Mathematical Instruments, &c” (iii). See Moxon *Mechanick Exercises, or, The doctrine of handy-works began Jan. 1, 1677 and intended to be monthly continued* (London: Moxon, 1677), EEBO. Moxon’s

which Moxon explains how to construct a “body of type,” the printer’s term for “a complete run of letters of all one font and size.”⁴⁰ Moxon describes the coupling of the “*Male-Block*” and “*Female-Block*” accomplished by the letter caster with “intense, almost lascivious detail”:

When his *Stick of Letters* is thus transfer’d to the *Male-Block*, he claps the middle of the *Male-Block* into his left-Hand, tilting the *Feet* of the *Letter* a little upwards, that the *Face* may rest upon the *Tongue*, and then takes about the middle of the *Female-Block* in his right-Hand, and lays it so upon the *Male-Block*, that the *Tongue* of the *Male-Block* may fall into the *Tongue* of the *Female-Block*...So that when the *Knot* of the *Male-Block* is lightly drawn towards the *Knot* of the *Female-Block*, or the *Knot* of the *Female-Block* lightly thrust towards the *Knot* of the *Male-Block*, both *Knots* shall squeeze the *Letter* close between them.⁴¹

In Moxon’s account, units of typography are produced in a process that is unmistakably sexual, as pieces of machinery not only meet, but lick, thrust at and squeeze each other and, through this libidinal force, engender a letter “close between them.” As Maruca points out, though, “[a]nother body intrudes in the love scene...the ‘he’ whose left and right hands are moving things along” (40). In this and other examples from Moxon’s manual, Maruca explains, “[t]he ‘mechanical exercises’ that make up the ‘whole art of printing’...are always human exercises as well. It is the *coupling* of man and machine that produces the body of type” (43). Like the process of epistolary production, the practice of publication is rooted in unusual unions between subjects and technological objects, here of body and press rather than body and pen. In fact, the “press-man” described by the

work on the printing press remained popular and relevant through the late eighteenth century, as evidenced by Philip Luckombe’s 1771 printer’s manual *The History and Art of Printing* (London: Adlard and Brown, 1771), ECCO (CW3306308319), which reproduces long passages from Moxon’s text without alteration.

⁴⁰ Lisa Maruca, *The Work of Print: Authorship and the English Text Trades, 1660-1760* (Seattle: University of Washington Press, 2008), 40. References are to this edition.

⁴¹ Quoted in Maruca, 40.

authors of printer's manuals resembles the penman in his commitment to meticulously calibrating this meeting of biological and technological parts.⁴² Moxon explains that a "Understanding *Press-man*" will "not only find great satisfaction in the contemplation of the harmonious design and Make of a *Press*, but as often as any Member, or part of it is out of order, he will know how to remedy any deficiency in it"⁴³: it is the printer's responsibility to maintain the harmonious accord between the machine's parts required for proper function. Mechanical parts are not the only ones that need constant calibrating, as Moxon's injunction that the press-man must demonstrate his "care and serious industry in the Physical and Manual performance of his Task" in order to achieve the status of a "good and curious Work-man" makes clear (270). Moxon explains that subtle changes in the relationship between the press-man's body and the printing press significantly alter the quality of the printed text the press produces. Certain varieties of type, because of their construction, are "very likely to be-smear the Stroaks of the Letter," especially, Moxon notes, if printed "with an Hard Pull, and too wet Paper," which allows that "some part of the Broad sholdering of the Letter, receiving the Ink, and pressing deep into the Paper, slurs the Printed Paper, and so makes the whole work shew very nasty and unbeautiful" (117). Philip Luckombe describes the nature of the "pull"—the motion the press-man performs in order to print a page of text—and its varieties in his 1771 manual *The History and Art of Printing*, explaining that

⁴² Printer's manuals descriptions of the press-man invariably identify printers and their apprentices as male, a convention I follow in my own use of male pronouns in my references to the press-man described in the manuals. Maruca discusses the erasure of women's labour from seventeenth- and eighteenth-century accounts of the production of printed texts in *The Work of Print*.

⁴³ Moxon, *Mechanick Exercises, or, The doctrine of handy-works began Jan. 1, 1677 and intended to be monthly continued* (London: Moxon, 1677), EEBO, 269-70. References are to this edition.

A long or soaking Pull, is when the Form feels the force of the Spindle by degrees, till the Bar comes almost to the hither Cheek of the Press, and this is also called a Soft Pull; because it comes soft, and soakingly and easily down: and for the contrary reason the Short Pull is called an Hard Pull, because it is suddenly performed.⁴⁴

Luckombe's text clarifies that the kind of pull the press-man performs depends not only on variables such as the printed text's size and typeface, but on the nature of the press-man's body:

If the Press-man be tall and strong and his work be Light, that is, a small form as great Letter, which needs not so strong a Pull as a large Form and small Letter, he covets to have a Short pull...But if the Press-man be low, and not very strong, he will require a Longer Pull, especially if the work be Heavy, viz. a large Form and small Letter: because the height of the Bar is generally made to lie at the command of a reasonable tall man, and therefore a low man cannot pull the handle of the Bar at so great a force at arm's end as a tall man; but will require the swinging of his whole body backwards to add force to the Pull: so that if the Pull be not Longer, he cannot fall enough backwards to get the Handle of the Bar within his command and force. And therefore a low man and Heavy Work required a long and soaking Pull. (331)

As Moxon's comment on the "nasty" results of an unsuitable pull suggests, the press-man, whether "tall and strong" or "low," must regulate his motion according to the qualities of his press and the nature of the text it is contracted to produce. The exemplary press-man, Moxon explains,

keeps a constant and methodical posture and gesture in every action of *Pulling* and *Beating*, which in a train of Work becomes habitual to him, and eases his Body, by not running into unnecessary diversions of Postures or Gestures in his Labour, and it eases his mind from much of its care, for the same causes have constantly the same effects. And a *Pull* of the same strength upon the same *Form*, with the same *Beating*, and with the same *Blankets*, &c. will give the same Colour and Impression. (334)

⁴⁴ Philip Luckombe, *The History and Art of Printing* (London: Adlard and Brown, 1771), 331. References are to this edition.

With his automatic motions—so habitual that they become mechanical—the press-man’s body is subsumed into the machine. Though he is left off of Luckombe’s list of the working parts of the press, the manuals’ accounts reveal that the press-man is, in fact, one of those “members,” which, “by their matter, form, and position, contribute such an assistance to the whole machine, that it becomes an engine manageable and proper for its intended purpose (294).”⁴⁵ While penman incorporates the writing implement into his or her body to render it a supplemental organ, the bodies that operate the printing press instead become one of that machine’s many components, their repetitive motions dictated by the technology’s “intended purpose” of reproducing manifold, identical versions of texts—each exhibiting the “same Colour and Impression”—for a mass audience. The contrast between these modes of textual production recalls Marx’s critique of labour’s mechanization in the *Grundrisse*. While the “instrument,” Marx writes, is a technology that “the worker animates and makes into his organ with his skill and strength, and whose handling therefore depends on his virtuosity,” as production is mechanized the machine itself becomes the virtuoso, and the worker’s labour, “reduced to a mere abstraction of activity, is determined and regulated on all sides by the movement of the machinery, and not the opposite.”⁴⁶ While Marx was, of course, describing the factory system, his

⁴⁵ Luckombe’s list of the parts of the printing press is as follows: “The Feet, Cheeks, Cap, Winter, Head, Till, Hose, Garter, Hooks, Spindle, Worm, Nut, Eye of the Spindle, Shank of the Spindle, Toe of the Spindle, Plattin, Bar, Handle of the Bar, Hind Posts, Hind Rails, Wedges of the Till, Carriage, Outer Frame of the Carriage, Iron Ribs, [294] Wooden Ribs on which the Iron Ribs are fastened, Stay of the Carriage, Coffin, Gutter, Plank, Gallows, Tinpans, Fristket, Points, and Point Screws” (293). This catalogue represents the press as a mechanical body into which a number of disarticulated human parts have been absorbed, in a manner that reinforces my assertion that the human body is ultimately subordinated to the press’s technologies.

⁴⁶ Karl Marx, *The Grundrisse: Foundations of the Critique of Political Economy*, trans. Martin Nicolaus (New York: Vintage Books, 1973), 692-693.

account of how labour becomes “scattered among the individual workers at numerous points of the mechanical system,” and “subsumed under the total process of the machinery itself”⁴⁷ finds a precursor in eighteenth-century descriptions of the press-man. In these printer’s manuals, as in Fanny Hill’s narrative, the practice of publication is one rooted in compulsion.

The girl in the machine

Just as Fanny’s liaison with Barville allegorizes the pains and pleasures of epistolary production, another of the *Memoirs*’ most extravagantly violent scenes—Fanny and Louisa’s encounter with Good-Natur’d Dick—figuratively explores the troubled relationship between bodies and the machineries of publication signaled in Fanny’s lament at the beginning of the second volume, and reinforced by the eighteenth-century accounts of print technology excerpted above. Fanny’s history of Louisa’s “terrible sally” with Good-Natur’d Dick—a “perfect changeling, or idiot” who “stammer’d so that there was no understanding even those sounds that his half-a-dozen, at most, animal ideas prompted him to utter” (160)—is one of the strangest and most disturbing episodes of her narrative. Fanny recounts how she, along with the other members of the “little family of love” (93) established at Mrs. Cole’s brothel, often encounter Dick in their neighbourhood, where he sells flowers to supplement the meager income his mother earns by mending stockings. While they “often bought his flowers, out of a pure compassion, and nothing more,” one day Fanny witnesses “a start of wayward fancy”

⁴⁷ Marx, *Grundrisse*, 693.

grip Louisa, in the form of a wish to finally sate her “strange longing to be satisfy’d, whether the general rule held good with regard to this changeling and how far nature had made him amends in her best bodily gifts, for her denial of the sublimer intellectual ones” (160-61).⁴⁸ Fanny and Louisa entice Dick into entering Louisa’s bedchamber and into a state of arousal which reveals him to be possessed of genitalia “of so tremendous a size, that prepar’d as we were to see something extraordinary, it still, out of measure surpass’d our expectation, and astonish’d even me, who had not been us’d to trade in trifles” (162). As the scene continues, Fanny watches as Louisa and Dick engage in intercourse, during which the twin forces of Dick’s enormous member and the “formidable fierceness with which the genial instinct acted upon him” join in “piercing, rending, and breaking open all obstruction,” ultimately leaving Louisa “torn, split, wounded,” and unable to escape from the “blind rage” of Dick’s recently-awakened lust (164).

I invoke this scene in order to explore the machine imagery that structures Fanny’s account of Louisa and Dick’s encounter. Throughout the rest of Cleland’s text, the machine metaphors Fanny invokes are used in relation to specific body parts, such as the memorable machine-penises discussed above. In contrast, as Fanny recounts Dick’s interactions with Louisa, she not only identifies his penis as a “curious engine” but also describes Dick himself as a “man-machine” or “brute-machine” (164). As Leo Braudy and, more recently, D. Christopher Gabbard have demonstrated, Cleland’s evocation of the figure of the machine-man engages with materialist philosophy, particularly the work

⁴⁸ This desire positions Louisa as another experimenter in the natural philosophy of sex, though as we shall see she arguably has less success in controlling the production of knowledge than Fanny.

of Julien Offray de la Mettrie,⁴⁹ yet The *Memoirs*' representations of machine life are also, as I have argued throughout this chapter, more specifically embedded in its fascination with the technologies of textual production. Near the end of the second volume, Fanny's account of Good-Natur'd Dick—in which the image of the machine moves from being identified with a discrete genital part to encompass the body as a whole—signals a change in the body's relationship to these technologies.

Fanny's descriptions of Dick as a man-machine center around his immense physical strength and the overwhelming power of his lust, which assert themselves unchecked by the strictures of rationality in the figure of the “purely sensitive ideot” (165). Likewise, Fanny's account constitutes the man-machine in relation to Louisa's body, which bears the full burden of its force. As Dick begins to penetrate her, “Louisa cry'd out violently,” Fanny writes,

that she was hurt beyond all bearing, that she was kill'd: but it was too late; the storm was up, and force was on her to give way to it: For now the man-machine, strongly work'd upon by the sensual passion, felt so manfully his advantages, and superiority, felt withal the sting of pleasure so intolerable, that maddening with it, his joys began to assume a character of furiousness which made me tremble for the too tender Louisa...(163)

⁴⁹ Braudy argues that both Cleland and la Mettrie represent the body and the mind as equally important to human experience, and that the process of reading the *Memoirs* acts as a didactic demonstration of this principle for the reader whose mind and body are both engaged by the novel. Gabbard's article explores the ways in which Cleland draws on the work of Locke, Willis, and la Mettrie to test (and ultimately trouble) traditional hierarchies of mental and bodily experience, particularly through his representations of Good-Natur'd Dick. See Braudy, “*Fanny Hill* and Materialism,” and Gabbard, “From Idiot Beast to Idiot Sublime: Mental Disability in John Cleland's *Fanny Hill*,” *PMLA* 123, no. 2 (2008): 375-389, <http://www.jstor.org/stable/25501860>.

As this inexorable pressure—which “nothing can stop” and “nothing can keep out” (164)—crushes Louisa, her cries of fear and pain subtly echo Fanny’s opening complaint that the weight of the press (identified as a force both sexual and coercive) has left her unable to catch her breath. The image of a woman’s “too tender” body being relentlessly crushed by a machine is particularly striking when considered in relation to Fanny’s descriptions of the machine-penis as an instrument that women are able to control, and even to co-opt as their own. While the machine-penis—associated with the pen—takes part in the kind of unfixed sexual play I parsed earlier in the chapter, the machine-body—associated with the press—fixes Louisa’s body in a posture of painful submission. What subsequently happens to Louisa is both disturbing and intriguing: the extreme pain she feels is turned pleasure, but seemingly against her will, denying any possibility of the perverse mastery I discussed above. Though she compares Louisa in her distress to a baited bear “tied to the stake, and oblig’d to fight the match out, if she died for it,” Fanny explains that while “she suffer’d, and greatly too,” she finally “suffer’d with pleasure, and enjoy’d her pain” as, “by dint of an enraged enforcement, the brute-machine, driven like a whirlwind, made all smoak again” and “left her in point of penetration nothing either to fear, or to desire” (164). Fanny writes that eventually

the pleasure gain’d upon her so, its point stung her so home, that catching at length the rage from her furious driver, and sharing the riot of his wild rapture, she went wholly out of her mind into that favourite part of her body...there alone she existed, all lost in those delirious transports, those extasies of the senses, which her winking eyes, the brighten’d vermilion of her lips, and cheeks, and sighs of pleasure deeply fetched, so pathetically express’d. In short, she was now as meer a machine, as much wrought on, and had her motions as little at her own command, as the natural himself, who thus broke in upon her...(165)

Under its implacable pressure, Louisa is incorporated within the machine, performing automatic motions dictated by its force. Limiting her experience and expression solely to that associated with her genital part, the machine presses Louisa into a mindless genericity. Her “transports” and “exstasies” are most generic of all, since this vocabulary recalls Fanny’s frustration, at the beginning of the second volume, with the “uniformity of adventures and expressions, inseparable from a subject of this sort”: she laments that “whatever variety of forms and modes, the situations are susceptible of, there is no escaping a repetition of near the same images, the same figures, the same expressions,” and that ultimately “the words *joys*, *ardours*, *transports*, *exstasies*, and the rest of those pathetic terms....flatten, and lose so much of their due spirit and energy, by the frequency they indispensably recur with” (92, emphasis Cleland’s). This articulation of discomfort with the notion of endlessly repeating “images,” “figures,” and “expressions” immediately follows Fanny’s reflections on the painful force of the press, signaling that this perpetual repetition is associated not only with the cyclically episodic nature of pornography, but also with the mass production of formerly unique textual artifacts enabled by print technology.⁵⁰ Like Louisa herself, then, the “*exstasies*” and “*transports*” she is finally confined to expressing are flattened—to use Fanny’s evocative term—under the pressure of the machine, and the ceaseless uniformity of motion, experience, and expression it mandates. The body’s relationship with technologies of print is thus quite different from its relationship with those of epistolarity. As Fanny and Louisa’s

⁵⁰ The very terms with which we might describe the “images...figures...and expressions” Fanny is dissatisfied with—that is, “cliché” or “stereotype”—are drawn, as Lynch has noted, from “the history of printing registers” and reference “a fear of repeating or copying the word” embedded in literary production’s mechanization (221).

experiences with the force of the mechanical press suggest, and eighteenth-century accounts of printing technology confirm, bodies that encounter the press are required to submit to it. Subsumed within its rhythms, these bodies lose both autonomy and specificity, and come to resemble the generic products of the press's work of mechanical reproduction.

Taking leave

The interlinked tensions these passages explore between the body of the epistolary narrator and the force of the press—and between the handwritten artifacts the penman produces and the homogenous objects the press subsequently generates—resurface as Fanny closes each of the two letters that comprise her narrative. As the first volume—and letter—ends, Fanny addresses the letter's recipient thus:

*I am,
MADAM,
Yours, &c. &c. &c.*

* * * * *

The second volume concludes similarly:

I shall see you soon, and in the mean time think candidly of me, and believe me ever.
*Madam,
Yours, &c. &c. &c.*

* * * * *

In Fanny's valediction, her signature—the definitive expression of handwriting's intimate connection with the body that produces it—is replaced by a row of typographical symbols. John Smith's 1755 manual *The Printer's Grammar* explains that the asterisk

was conventionally “used to supply a name of a person that chuses to pass anonymous”; Smith further notes that asterisks can “denote an omission, or an hiatus; by loss of original Copy; in which case the number of [asterisks] is multiplied according to the largeness of the chasm.”⁵¹ The valedictions thus exchange Fanny’s signature for a printed representation of anonymity, absence, and loss. Even as they obscure the individual writing body, however, the lines of asterisks participate in what Park recognizes as the efforts of eighteenth-century typography to “accommodate the human figure and even its ineffable and absent parts.”⁵² Park draws our attention to how “[t]he row of asterisks” used to “denote female genitalia” in *Tristram Shandy* “exemplify how print graphically renders the human body in eighteenth-century novels.”⁵³ The repeated lines of “&c.” that flank the asterisks in Fanny’s valediction use a symbol that often performed a parallel function to the asterisk in eighteenth-century texts. Patrick Spedding and James Lambert note that in many works the “&c.” becomes “a clear sign of the erasure of a word or phrase”—often, implicitly, an indecent one—and operates “like the eighteenth-century dash” as an indicator that “alert[s] the reader to the fact that an obscenity has either been used or has been narrowly avoided.”⁵⁴ Spedding and Lambert highlight the way that Henry Fielding “transforms Aaron Hill’s praise of *Pamela*, ‘a poor Girl’s little, innocent, Story,’ into suggestive ambiguity by describing the story as ‘a poor Girl’s little &c.’”⁵⁵

⁵¹ John Smith, *The Printer’s Grammar, wherein are exhibited, examined, and explained, the superficies, gradation, and properties of the different sorts and sizes of metal types* (London: John Smith, 1755), 79, ECCO (CW3308477132).

⁵² Park, xxii.

⁵³ Park, xxii.

⁵⁴ Patrick Spedding and James Lambert, “Fanny Hill, Lord Fanny, and the Myth of Metonymy,” *Studies in Philology* 108, no. 1 (2011): 123, <http://www.jstor.org/stable/41059282>.

⁵⁵ Spedding and Lambert, 123.

Cleland's text invokes the same connection between typographical symbols and sexualized body parts with its account of the bathing scene, in which Fanny describes her partner "giving his hands the regale of going over every part of me, neck, breast, belly, thighs, and all the sweet *et cetera*, so dear to the imagination" (168). Fanny's "*et cetera*"—or "&c."—becomes both a coy textual insinuation and a graphic representation of her genitalia. When the &c., along with the asterisk, reappear at the end of each letter in place of the details of Fanny's valediction and her signature, Fanny's writing body—the penman that plays such an important role in the novel as both author and participant—is erased and replaced with a series of typographical symbols that reduce this body to the same "favourite part" that remained when Louisa was crushed under the force of the machine. With these "*smutty daubings*,"⁵⁶ the fluidly gendered writing body of the penman is flattened and fixed into an anonymous representation of femininity. Moreover, as the letters' handwritten text ends and each volume gives way to the printed publication in which it is reproduced and circulated, the replacement of Fanny's signature with a line of asterisks signals a simultaneous shift from individual identity to an anonymous, infinitely reproducible genericity.⁵⁷

⁵⁶ The phrase is Hooke's, from his description of "the mark of a full stop, or period" on a printed page as seen through a microscope. See *Micrographia*, 3.

⁵⁷ The generic nature of printed text is often compared unfavourably to the qualities of the written word in penmanship manuals. A 1702 copybook by William Banson argues that "The Famed Inventor of the Printers Press / Had he but seen such Characters as these / Would his even much admired Art...And all his Type as flat and dull condemn": see Banson, *The merchant's penman: A new copy book of the usual hands now in practice by most book-keepers in Europe* (London: John Stuart, 1702), ECCO (CB127277332), i. In his essay *Of the First Invention of Writing*, More extols the unique properties of handwritten text, contending that there is "Something" in a "Masterly Curious Hand" that "which nothing but the *Pen* can express," which "gives Life and Spirit to a Letter, that makes *Strokes* seem to *Move*, and casts a kind of Glory round 'em," creating in "the Judicious Beholder, Pleasure ineffable" (6). Clark, in *Writing improv'd or Penmanship made easy*, argues that letters that are merely "exact in Symmetry" but "want that *Spirit* which only can render it an *Object* both Valuable and Delightful" are ultimately only "a dead *Corps*" (2).

This shift—marked by Fanny’s absent signature—from epistle to printed text is one bound up with the female body, that figure graphically evoked by the printed characters presented in place of her name.⁵⁸ As Elizabeth Heckendorn Cook comments, during the eighteenth century the personal letter was “intimately identified with the body, especially a female body”; the printed letter-text thus “exposes the private body to publication” in a manner both troubling and alluring.⁵⁹ Ruth Perry identifies the role this tension between privacy and exposure played in marketing eighteenth-century epistolary texts, observing that

[b]ecause so many private relationships came to be conducted in letters, especially for home-bound women, these exchanges came to be understood as a repository for emotions usually enclosed by convention, the place to look for records of a person’s secret doings. Booksellers often advertised the fact that a set of letters had not been intended for publication because privacy, like virginity, invites violation.⁶⁰

Perry’s description of the epistolary text’s attractions highlights an uneasy dichotomy in which the private epistle is linked to the private, chaste female body and the published letter-text to its promiscuous double. In this schematic, the printed epistolary narrative comes to resemble the body of the prostitute as, circulating widely, it capitalizes on the perversion of its original virtue/value. The *Memoirs* burlesques the problematic status of publicly traded “private” virtue as it satirically represents the marketability of virginity. Fanny’s notional maidenhead is sold many times over for increasing returns; in the most

⁵⁸ Whether the name “Fanny Hill” is itself a graphic representation of genitalia has long been the subject of lively debate in scholarship on the text. Spedding and Lambert’s “Fanny Hill, Lord Fanny, and the Myth of Metonymy” provides a good overview of the topic, while arguing forcefully (though not entirely convincingly) against those who believe the name is an explicit pun.

⁵⁹ Elizabeth Heckendorn Cook, *Epistolary Bodies: Gender and Genre in the Eighteenth-Century Republic of Letters* (Stanford: Stanford University Press, 1996), 6.

⁶⁰ Ruth Perry, *Women, Letters, and the Novel* (New York: AMS Press, 1980), 70.

successful exchange of this nature, Mr. Norbert pays 400 guineas to deflower Fanny, who fabricates the “niceties, apprehensions, terrors” and—with the help of a blood-soaked sponge—the material evidence of her purportedly virginal state with such success that Norbert believes he has gotten a bargain (133). In the context of Heckendorn Cook and Perry’s accounts of epistolarity, Fanny’s amused exploitation of “that innocence which the men so ardently require in us, for no other end than to feast themselves with the pleasure of destroying it” (131) can be seen as more than just an expression of the “problematic collision (and collusion) between the commodification of women and the idealization of chastity” during the eighteenth century.⁶¹ Reading these scenes in the context of the novel’s thematization of textual production, we can recognize how Fanny’s shamming sale of her maidenhead is linked to the *Memoirs*’ bridging of epistolarity and mechanized print culture. Just as the text charts how Fanny’s virginity is transformed from private virtue to public product, it records the analogous way in which her correspondence is converted from personal artifact to a commodity rendered eminently saleable by the mystique of confidentiality and discretion that its mass publication so extravagantly destroys. But while, in the text, Fanny eventually achieves control over the fictional corruption of her chastity, her discomfort with pressing her narrative into a “public...good” (92) suggests that the processes of objectification and exposure involved in printing the private female subject remain a violation.

⁶¹ Tassie Gwilliam, “Female Fraud: Counterfeit Maidenheads in the Eighteenth Century,” *Journal of the History of Sexuality* 6, no. 4 (1996): 518, <http://www.jstor.org/stable/4617220>.

The *Memoirs*' interest in the relationship between virtue, female embodiment, and the promiscuous public circulation of texts marks its participation in what William Warner has named the "*Pamela* media event,"⁶² since the same concerns shaped the reception of Richardson's novel. Ann Louise Kibbie calls attention to how *Pamela*'s epistolarity structures the erotic experience of both character and reader, noting that "B.'s desire for the heroine's person" is ultimately "diverted to the letters that come to stand for her body."⁶³ Kibbie demonstrates that

[t]he identification of the letters with the female body becomes most explicit in the scene where, terrified by B.'s threats to strip her, Pamela relinquishes the papers she has sewn into her clothing. B.'s response to Pamela's admonishment that she would take his returning the letters 'without breaking the seal' as 'a good omen' is to 'break the seal instantly,' declaring, 'So much for your *omen*!' The reader repeats B.'s act of penetration in his own relation to the text of *Pamela*, as the scene of reading itself has been eroticized...⁶⁴

The puff pieces that precede the text proper in early editions of *Pamela* indicate the extent to which this eroticized reading experience functioned as the text's primary attraction, even for readers, such as Jean Baptiste de Freval, who celebrate its "moral Reflections" and the "Example of Purity" it offers.⁶⁵ In "To the Editor of the Piece intituled, *PAMELA; or, VIRTUE Rewarded*" de Freval explains to Richardson that part of the "inexpressible Pleasure" he experienced in "the Perusal of your *PAMELA*" was occasioned by the fact that "the Letters" were "written under the immediate Impression of every

⁶² See Warner, *Licensing Entertainment: The Elevation of Novel Reading in Britain, 1684-1750* (Berkeley: University of California Press, 1998), chapter 5.

⁶³ Kibbie, "Sentimental Properties," 576.

⁶⁴ Kibbie, "Sentimental Properties," 576.

⁶⁵ Jean Baptiste de Freval, "To The Editor of the Piece intituled, *PAMELA; or, VIRTUE Rewarded*," in *Pamela; or, Virtue Rewarded*, by Samuel Richardson, ed. Thomas Keymer and Alice Wakely (Oxford: Oxford University Press, 2001), 6. References are to this edition.

Circumstance which occasioned them, and that to those who had a Right to know the fair Writer's most secret Thoughts" (5). The detail that de Freval, like the rest of *Pamela's* readership, is not among those who possess the "Right" to scrutinize these intimate reflections—a privilege held only by Pamela's parents, the addressees of her voluminous prose—is implicit but insistent, marking the fact that the "inexpressible Pleasure" of reading Pamela's correspondence inheres in a violation of the "Propriety" de Freval hails in Richardson's heroine. De Freval's concluding exhortation, "Little Book, charming PAMELA! face the World, and never doubt of finding Friends and Admirers, not only in thine own Country, but far from Home" (6), further complicates his assessment of the book and its heroine, as his apostrophe collapses text and body into one desirable object and foregrounds that object's wide circulation among an international group of ambiguously-defined "Friends and Admirers." Following from this statement, de Freval's hope that "every head-strong Libertine whose Hands you reach [may] be reclaimed" (6) concretizes the sexualized nature of *Pamela's* circulation by providing an image of the text/body being grasped by an unrepentant rake. The problematic status of Pamela's virtue—which soon became the principal focus of the media frenzy surrounding the novel's publication—is thus the unacknowledged subject of de Freval's essay; even as his piece celebrates Pamela/*Pamela's* propriety, it makes clear the ways in which mass publication is incompatible with private virtue, and, in fact, enacts its corruption. This corruption animates the *Memoirs*, as both Fanny Hill and *Fanny Hill*—as, not coincidentally, the novel became popularly known—come to circulate freely among friends, admirers, and head-strong libertines. When Fanny's epistolary narrative

concludes with “*Yours, &c. &c. &c. * * * * **,” the replacement of her signature with a line of printed symbols thus references the process through which the private subject—associated with the epistle—is transformed into a globally distributed object, “*Yours*” if you can pay the price. As a result, we see that Fanny’s profession is bound up not only with the unstable gender identity she embodies as she produces handwritten text, but with how that text circulates once published: offering each of its consumers the opportunity to perform an act of violation as if for the first time.

Fanny Hill’s narrative joins a number of other eighteenth century texts in which, as Rosenthal argues, “the figure of the prostitute...exposes and probes the costs and benefits of commercial modernity,” and the “transformation of identity demanded by the social, economic, and the political changes in the period.”⁶⁶ More particularly, Cleland’s novel interrogates these costs and benefits in the context of eighteenth-century technologies that transformed the self into a textual object. As its erotic episodes allegorize the actions of the penman and the printing press, the *Memoirs* explores the implications of the rapidly expanding print culture in which their productions circulated. Bridging the realms of manuscript and printed work as a published text ostensibly based on private letters, the *Memoirs* juxtaposes both texts’ enabling technologies through a series of erotic scenarios structured by violence. Disciplinary and punitive, this violence is a constitutive force that Fanny Hill is subject to, but one which she also exceeds through her perverse experiences of pleasure and mastery. This pleasure is most evident

⁶⁶ Laura Rosenthal, *Infamous Commerce: Prostitution in Eighteenth-Century Literature and Culture* (Ithaca: Cornell University Press, 2006), 2-3, 14.

in the novel's representations of penmanship, in which the relationship between the technology of textual production and its operating subject is characterized by gender fluidity and sexual play. The pen's status in the *Memoirs* as, at once, a disciplinary tool, "external [organ] of the body," and detachable part perhaps reflects the instrument's own unfixed position between the symbolic ornaments (such as rings, gloves, and jewelry) that externally constituted selfhood in the early modern period, and the objectifying technologies that made interior subjectivity visible in the eighteenth century.⁶⁷ The printing press, one such technology, is evoked in the *Memoirs* as a force whose pains are less easily mitigated, embedded as it is in a system of production and circulation to which the gendered body is impressed as a functional part.

⁶⁷ I quote from and draw on Peter Stallybrass and Ann Rosalind Jones's "Fetishizing the Glove in Renaissance Europe," *Critical Inquiry* 28, no.1 (2001): 116, <http://www.jstor.org/stable/1344263>.

CHAPTER 4

Mechanizing Manufacture and Manufacturing the State in the British Cotton Industry

If the industrial manufacture of text was, as I have shown, crucial to the production of new forms of gendered embodiment and subjectivity across the eighteenth century, so too was the manufacture of textiles, particularly as the traditional wool and linen industries were superseded by the mechanized cotton manufacture from the 1770s forward. The cotton manufacture—still widely seen as the industrial revolution’s origin point—was, from the beginning, framed as a labour implicated in Britain’s national identity. In 1785, little more than a decade after the introduction of devices that supported the large-scale production of cotton thread in Britain, pamphleteer John Wright characterizes the cotton manufacture as a “fountain from whence many currents flow, to enrich individuals, and to enhance the national consequence.” Cotton, he writes,

is now an object of the greatest moment to the West India planters—is brought home in many ships—supports great numbers of our seamen—fills the nurseries of industry by employing many thousands of children—causes a plentiful subsistence to myriads of both sexes and of all ages, who pay many taxes in the consumption of many articles—brings opulence to the manufacturer and the merchant—and draws much wealth from distant nations...¹

Wright’s comments vividly capture both the cotton manufacture’s key place in the long-sought dominance Britain attained over global systems of trade through the late eighteenth century, and the industry’s inseparability from the violence of imperial expansion. While Wright marveled at the “consequence” the cotton manufacture

¹ John Wright, *An address to the members of both houses of Parliament on the late tax laid on fustian, and other cotton goods* (Warrington: W. Eyres, 1785), 19, ECCO (CW3307752034).

bestowed upon Britain, other commentators admired the rapidity with which the industry had produced it. As an anonymous writer insisted in 1788,

the magnitude of this trade, and the national advantages derived from such a combination of human labour with ingenious machinery, can scarce be supposed to have made an impression equal to the importance of the object; because the progress has been rapid beyond example—It has burst forth, as it were, upon the country, in a moment, giving a spring at the same time to the industry of the people, unexampled in the annals of the world.²

John Aikin likewise foregrounds the scale of the manufacture's growth in his description of its epicenter, Manchester: a city which, he writes, fosters "a branch of commerce, the rapid and prodigious increase of which is, perhaps, absolutely unparalleled in the annals of trading nations."³ These passages signal the cotton manufacture's importance in generating and consolidating a vision of Britain as the cradle of global technological industry, a national identity that made the country's mechanical ingenuity concomitant with its commercial and cultural dominance. In this chapter, I explore what this nascent national project meant for the bodies upon which the British cotton industry's "astonishing combination of human and artificial labour"⁴ depended. Reading a varied collection of sources from the late eighteenth and early nineteenth centuries—including pamphlets and treatises on the cotton industry, pedagogic literature for children, polemic poems, letters to parliament, travel accounts, histories, trade manuals, and works on political economy—I trace the ideological impetus to make Indian technologies of cotton textile production a British concern, and how this endeavour required the devaluation of

² *An important crisis, in the callico and muslin manufactory in Great Britain, explained* (London, 1788), 1-2, ECCO (CW3305291666).

³ John Aikin, *A description of the country from thirty to forty miles round Manchester* (London: John Stockdale, 1795), 3, ECCO (CW3302286873).

⁴ *An important Crisis*, 6.

Indian labour in order to author the imagined supremacy of English mechanical technologies. Then, I analyze how British female textile workers (who had traditionally performed the task of spinning thread) were essential to the process of mechanization, even as this process marginalized and disavowed their role within it. Spinsters' skilled labour was reproduced by apparatuses like the spinning jenny and water-frame; concurrently, because of the necessity of articulating a British superiority based in technological innovation, manual spinning was represented as a primitive endeavour, and labouring women's bodies as lacking any (re)productive force without the assistance of machinery. Finally, I consider how these projects, at once material and textual, consolidated a new nationalism in technological innovation, and made the cultivation and reproduction of Britishness itself dependent on machines.

A State of Very High Perfection

The cotton manufacture's mechanization began in 1764 with James Hargreaves' invention of the spinning jenny, a machine that adapted the principles of the traditional spinning wheel to multiply the amount of operational spindles from one to sixteen, thus increasing the amount of thread that could be simultaneously produced by a single spinster by the same ratio.⁵ This relatively simple, hand-operated machine, which was originally small enough to be used by women in their homes (much like the spinning wheels it replaced),⁶ was progressively modified to increase its number of spindles: by

⁵ C. Aspin and S.D. Chapman, *James Hargreaves and the Spinning Jenny* (Helmshore: Helmshore Local History Society, 1964), 42.

⁶ S.D. Chapman, *The Cotton Industry in the Industrial Revolution* (London: McMillan, 1987), 17.

the end of the eighteenth century, jennies with up to 130 spindles were used in industrial settings.⁷ Following Hargreaves, inventors continued to turn their attention to spinning technologies, and in 1769 Richard Arkwright introduced the water-frame, so called because it ran on water power—a characteristic that meant it was only suitable for use in a mill or factory (the early designs of which Arkwright was instrumental in developing). The water-frame used a series of rollers to refine thread with a “drafting action,”⁸ and, unlike the jenny, could produce fibers strong enough to be used as warp threads.⁹ In the late 1770s Samuel Crompton debuted the spinning mule, which combined the actions of the jenny and water-frame and was thus a more versatile machine, capable of producing both warp and weft in myriad degrees of fineness. Mechanical developments in weaving were much slower to be brought to functionality and extensive use than these spinning technologies were: the power loom, for example, though invented in 1787, was not used with success until at least 1806, and did not begin to replace hand-loom on a large scale until later in the nineteenth century.¹⁰

⁷ Aspin and Chapman, 46.

⁸ Harold Catling, *The Spinning Mule* (Newton Abbot: David & Charles, 1970), 9. Erasmus Darwin describes the action of the water-frame in the section on cotton in *The Botanic Garden*, writing that the roving (cotton wool that has been carded but is “yet very loosely twisted”) is “received or drawn into a *whirling canister*, and is rolled by the centrifugal force in spiral lines within it; being yet too tender for the spindle. It is then passed between *two pairs of rollers*; the second pair moving faster than the first elongate the thread with greater equality than can be done by the hand; and is then twisted on spoles [*sic*] or bobbins” (emphasis in original). See *The Botanic Garden. Part II. Containing the loves of the plants* (London: J. Nichols, 1790), 65, ECCO (CW3314167280).

⁹ Joel Mokyr, “Technological Change 1700-1830,” in *The Economic History of Britain Since 1700*, ed. Roderick Floud and Deirdre McCloskey (Cambridge: Cambridge University Press, 1994), 1:19. “Warp” denotes the function of the fiber in the process of weaving: warp threads are “the threads which are extended lengthwise in the loom, usually twisted harder than the weft or woof, with which these threads are crossed to form the web or piece.” *Oxford English Dictionary Online*, s.v. “warp, n.1,” last modified June 2014, <http://www.oed.com/view/Entry/225817>.

¹⁰ Ivy Pinchbeck, *Women Workers and the Industrial Revolution 1750-1850*, 2nd ed (New York: A.M. Kelley, 1969), 116.

While the classic histories of textile technologies have tended to focus on British ingenuity and its products—both textile and, as in the case of the rise of the industrial factory system, socioeconomic—it is important to note that this rapid process of technological development did not arise spontaneously, but was the result of a specific set of historical circumstances.¹¹ The British cotton manufacture was developed in direct response to the country's rapidly intensifying involvement in the trade in eastern goods. While England's own textile arts had a long history—the wool manufacture had been one of the nation's defining industries for centuries—cotton, uncultivable on the British Isles,¹² had always entered England as an import product, historically via traders in Venice and the Middle East.¹³ Throughout the medieval and early modern periods, however, the extent of this cotton import trade was negligible. It was not until English ships began to arrive home laden with Indian muslins and calicoes in the seventeenth century that cotton fabrics became the object of mass consumer desire across the British Isles. This trade in textiles had originally been entered into only as a supplement—even an afterthought—to the lucrative import of spices and teas from the east, but Angela Lakwete notes that, beginning in the seventeenth century, “the trade in cotton fiber, yarn, and fabrics...moved from the periphery to the forefront of British mercantile policy” (19),

¹¹ For classic histories of the British cotton manufacture, see, for example, Chapman, *The Cotton Industry in the Industrial Revolution*; Eric Kerridge, *Textile Manufactures in Early Modern England* (London: Dover, 1985); Seymour Shapiro, *Capital and the Cotton Industry in the Industrial Revolution* (Ithaca: Cornell University Press, 1967); Michael M. Edwards, *The Growth of the British Cotton Trade, 1780-1815* (Manchester: Manchester University Press, 1967); and Alfred P. Wadsworth and Julia De Lacy Mann, *The Cotton Trade and Industrial Lancashire, 1600-1780* (Manchester: Manchester University Press, 1931).

¹² Cotton grows indigenously only between the latitudes of 47° north and 35° south. See Angela Lakwete, *Inventing the Cotton Gin: Machine and Myth in Antebellum America* (Baltimore: Johns Hopkins University Press, 2003), 2. References are to this edition.

¹³ Lakwete, 30.

in response to the overwhelming consumer demand for these products—a demand characterized, by period commentators as well as by contemporary historians and literary critics, as a “craze” (1).

A number of qualities combined to make Indian cotton textiles particularly coveted by English consumers. The fabrics were unprecedentedly soft, lightweight and breathable, making them comfortable against the skin, especially in warmer weather. They were durable and easily cleaned, and thus ideal for use in the undergarments, traditionally made of linen, which saw heavy use and frequent washing. Further, the price point of Indian cotton textiles was so low that the fabrics were accessible to consumers in a wide range of economic positions. Perhaps most importantly, however, advanced Indian technologies of fabric printing, painting, and dyeing meant that the calicoes came in an astounding range of brilliantly hued and patterned designs that remained colourfast through many launderings.¹⁴ Indian manufacturers were not only able to produce a huge range of styles and colours in their textiles, but were also poised to respond quickly and flexibly to the demand of various markets; soon after the cotton “craze” gained momentum in England, Indian suppliers were crafting textiles according to the tastes of English customers.¹⁵ These textile designs were unlike any that most Britons had ever

¹⁴ Sources on the qualities of seventeenth and eighteenth century Indian cottons include Beverly Lemire, *Fashion's Favourite: The Cotton Trade and the Consumer in Britain, 1660-1800* (Oxford: Oxford University Press, 1992); Maxine Berg, “In Pursuit of Luxury: Global History and British Consumer Goods in the Eighteenth Century,” *Past & Present* 182 (2004): 85-142, <http://www.jstor.org/stable/3600806>; and Beverly Lemire and Giorgio Riello, “East and West: Textiles and Fashion in Early Modern Europe,” *Journal of Social History* 41, no. 4 (2008): 887-916, <http://www.jstor.org/stable/25096561>.

¹⁵ Hugh Honour quotes an example of the kind of demands made by English consumers on Indian manufacturers in the form of a 1643 letter from the directors of the East India company to a factor at Surat: The Pintadoe [painted cloth] Quilts came safe to our hands and we have disposed of some part of them in sales at 50sh/- each piece. They serve more to content and pleasure our friends than from any profit that ariseth in sales, your first cost, freight and custom being put together. Of these 60 or

seen, and were far beyond the capabilities of the textile manufacture in Britain at the time. As Beverly Lemire and Giorgio Riello explain,

In Europe, woollens, but also silks and velvets, were patterned on the loom and their design was the product of complex methods of weaving and finishing. Thus the “fashioning” of textiles in Europe had relied mainly on time-consuming techniques of weaving on the loom and embellishing with the needle. In contrast, Indian artisans in the textile regions of the Gujarat, Coromandel Coast and Bengal produced a rainbow of colours, patterns and prints suited to the tastes of discrete markets from Japan to East Africa, Indonesia to Central Asia, Persia and to the Eastern Mediterranean beyond. Painting and printing were more adaptable, faster and less expensive than weaving design.¹⁶

The seemingly endless variety of exquisite textiles suddenly available to British consumers through the Indian import trade stoked a cultural obsession with novelty, and powered the caprices of the newly ascendant fashion system.

This rapidly intensifying consumer desire, and the mass of Indian products that were hastened into the country to both satisfy and further incite it, quickly threw the British textile manufacture—which relied on the unglamorous staple fabrics of wool and linen—into a state of crisis. In the 1690s, these manufacturers began to campaign against the textile import trade; by 1717, Chloe Wigston Smith explains, “widespread depression in the wool industry...animated the weavers and wool manufacturers to call for a ban on importing or wearing Indian cottons.”¹⁷ Restrictions were finally instated in 1721 with the Calico Act, which “prohibited English men and women from wearing and using calico

100 quilts will be as many as one year will vent. Those which hereafter you shall send we desire may be with more white ground, and the flowers and branch to be in colours in the middle of the quilt as the painter pleases, whereas most parts of your quilts come with sad red grounds which are not so well accepted here, and therefore let them be equally sorted to please all buyers.

See *Chinoiserie: The Vision of Cathay* (London: John Murray, 1961), 49.

¹⁶ Lemire and Riello, 892-893.

¹⁷ Chloe Wigston Smith, ““Callico Madams’: Servants, Consumption, and the Calico Crisis,” *Eighteenth Century Life* 31, no. 2 (2007): 31.

for clothing and household interiors, with penalties running from five pounds for wearing the fabric to twenty pounds for selling it,” and offered cash rewards to citizens who informed on any violations they observed.¹⁸ Though the ban seemed like a solution to the pressures placed on British textile production by Indian cotton, in reality it proved largely ineffective: the sheer variety of fabrics available from India meant that the ban addressed only a limited portion of the total market, and, more damningly, the imported fabrics were simply too popular for the ban to eliminate either their appeal or their wide circulation.¹⁹ If the British textile market was to offer a true challenge the import trade, another solution was required: thus, the process of making cotton a British industry began.

The perceived necessity that drove these challenges was as much ideological as it was economic. As scholars of industrial and economic history have shown, the market for cotton fabrics did not actually begin to supersede that for wool in Britain until at least the 1820s; further, the British wool industry continued to expand through the 1770s, and afterwards remained relatively stable.²⁰ Though demand for wool was affected by the national obsession with cotton, the wool industry was not, in fact, on the brink of obsolescence at any point during the eighteenth century. Public responses like the Calico Act of 1721 and the eventual attempt to establish a British cotton manufacture were

¹⁸ Wigston Smith, 34.

¹⁹ See K.N. Chaudhuri, *The Trading World of Asia and the English East India Company* (Cambridge: Cambridge University Press, 1978), 279, and Lemire, *Fashion's Favourite*, 41-42.

²⁰ Maxine Berg, *The Age of Manufactures: Industry, Innovation, and Work in Britain, 1700-1820* (Totowa: Barnes and Noble, 1985), 30. The linen manufacture, Britain's other staple textile industry, was not seriously negatively affected by the new interest in cotton until the introduction of mechanized cotton processing in Britain. See Patricia Baines, *Flax and Linen* (Merlins Bridge: Shire, 2003).

rooted in the way British citizens understood their relationship to the wider world, and, particularly, to the east. As Eugenia Zuroski Jenkins has argued, this was an understanding that shifted over the course of the long eighteenth century. During the Restoration and the early eighteenth century, Zuroski Jenkins demonstrates, English interactions with eastern products were characterized by a “consumer-based cosmopolitanism” informed by Lockean empiricism, in which both the individual and the nation were imagined as “a collection of spaces in need of furnishing.”²¹ Into these spaces the eastern consumer product (epitomized by the chinoiserie object) was systematically incorporated, in order to “confirm that the very concept of ‘INFINITE VARIETY’ was within the purview of the English mind” (65), though anxieties about the proper place and use of such products still abounded. Around 1750, however, this cosmopolitan order started to crumble as these apprehensions mounted: “Englishness” began to be viewed as a category constructed against (rather than with) the materials of the east, and contact with eastern objects began to “indicate a self infiltrated by foreign substance” (151). Given this history of English engagement with eastern consumer products, in which cosmopolitanism eventually gave way, around mid-century, to an orientalist paradigm, it is no coincidence that in the second half of the eighteenth century the English textile industry worked with increasing diligence to make cotton textile production a domestic system rather than an import trade.

²¹ Zuroski Jenkins, *A Taste for China: English Subjectivity and the Prehistory of Orientalism* (Oxford: Oxford University Press, 2013) 35, 50. “Eastern products” designates both imported products from Asia and English or continental imitations or interpretations of Asian consumer objects.

This domestication of the cotton manufacture was accomplished through a twinned industrial and ideological apparatus, and was rooted in Britain's inadequacy in the face of the Indian textile industry. As noted above, the desirable qualities of Indian cottons arose from the array of sophisticated production technologies Indian manufacturers used to process, weave, and dye the fibre.²² The superior fabrics these techniques fashioned, and the long-established, lucrative trading networks through which the textiles were subsequently circulated, together represented a sophistication of production and distribution unmatched by any English industry. Indian textile production thus became one of the many contexts in which the British in India were confronted with "an epistemology, technology, and aesthetic to which they had no access save what they saw themselves"; Indian dyeing techniques, for example, were one of the many "native scientific and technological practices" that, as Rajani Sudan has shown, were obsessively documented by correspondents of the Royal Society.²³ Sudan notes that this documentation purports to explicate (and thus bestow legitimacy upon) these techniques via British scientific instruments, but actually records the failure of these instruments—chief among them the "well-trained empirical eye"—to discern methods of production; likewise, Royal Society correspondence from India frequently registers the superiority of Indian production technologies as compared with their British counterparts.²⁴ In the case of the textile industry, Britain's inadequacy was felt with particular keenness, for, while

²² A number of these technologies are described in detail in K.N. Chaudhuri's *Asia Before Europe: Economy and Civilization on the Indian Ocean from the Rise of Islam to 1750* (Cambridge: Cambridge University Press, 1990).

²³ Rajani Sudan, "Mud, Mortar, and Other Technologies of Empire," *The Eighteenth Century* 45, no. 2 (2004): 159, 150-153, <http://www.jstor.org/stable/41467944>.

²⁴ Sudan, 152-53.

Indian cottons were the objects of intense consumer desire in Britain, English woollens exported to India utterly failed to sell.²⁵ Many writings on the textile trade throughout the eighteenth century make reference to the superiority of Indian textiles, and, as K.N. Chaudhuri observes,

the memory and the tradition of a superior Asian technology and the quality of the products, built up over a period of nearly two centuries, was so strong that even in the third quarter of the eighteenth century, when the Indian textile industry was about to face a crippling challenge from the discovery of machine spinning and weaving in Britain, many contemporary observers continued to believe that the superfine cotton fabrics of Bengal could never be imitated by anyone else in the world.²⁶

Dorning Rasbotham writes, for example, in 1780, “*Perhaps*, by new improvements, we may vie with the *East-India goods* in fineness and beauty. And then—what a prospect would open to us!”²⁷ In 1799, Robert Heron explains that, earlier in the century,

our manufacturers ventured...to try whether they could not imitate the beautiful cotton stuffs of the East. Only the coarser sorts of these, however, did they first attempt. The finer seemed inimitable. Although the fabrics were woven; yet how should they be painted with that elegant diversity of figures and colours with which the stuffs of India were adorned?²⁸

²⁵ Sudan, 154. Sudan quotes a 1614 letter from Nicholas Downton that details the futility of exporting English textiles to India: “It seemeth to me the ill sales of cloth in India put Mr Aldworthe into an extraordinary desire by inquisition to seek out a better place in regard of their cloths yet remaining on their hands, as for such as he feared were to come by the next shipping, and the next after that, before advice can be sent home to forbear...” (154).

²⁶ Chaudhuri, *Asia Before Europe*, 297.

²⁷ Dorning Rasbotham, *Thoughts on the use of machines, in the cotton manufacture. Addressed to the working people in that manufacture, and to the poor in general. By a friend of the poor* (Manchester: J Harrop, 1780), 16, ECCO (CW3308605969). Rasbotham was a Manchester author, historian, and local authority, acting as “chairman of the quarter sessions at Manchester for twenty-five years, and high sheriff of Lancashire in 1769.” See the *Oxford Dictionary of National Biography*, s.v. “Dorning Rasbotham (1730–1791),” by C. W. Sutton, rev. J. A. Marchand, last modified 2004, doi: 10.1093/ref:odnb/23146.

²⁸ Robert Heron, *Observations made in a journey through the western counties of Scotland, in the autumn of M.DCC.XCII*, 2nd ed. (Perth: W. Morison et al, 1799), 1:104, ECCO (CW102423119). Heron was a Scottish journalist and author who briefly worked as assistant to Dr. Hugh Blair, and was known for his account of his friendship with Robert Burns and his six-volume *History of Scotland* (1794–9). See *Oxford Dictionary of National Biography*, s.v. “Robert Heron (1764–1807),” by T. F. Henderson, rev. H. C. G. Matthew, last modified 2004, doi: 10.1093/ref:odnb/13090.

Robert Orme's 1783 history of India dwells on a number of the production techniques that made these textiles so unattainably fine:

The women likewise spin the thread designed for the cloths, and then deliver it to the men, who have fingers to model it as exquisitely as these have prepared it. For it is a fact, that the tools which they use are as simple and plain as they can be imagined to be. The rigid, clumsy fingers of a European would scarcely be able to make a piece of canvass, with instruments which are all that an Indian employs in making a piece of cambric. It is farther remarkable, that every distinct kind of cloth is the produce of a particular district, in which the fabric has been transmitted, perhaps for centuries, from father to son, a custom which must have conduced to the perfection of the manufacture.²⁹

As Orme's description hints, much as English manufacturers and traders wished to adopt Indian production methods, a number of factors prevented the replication of techniques from the subcontinent in England. The failure of British observers to understand the production techniques they viewed forestalled the successful imitation of Indian technologies; in the passage above, for example, Orme offers an account of the textile manufacture that lacks any specific details about its processes, a descriptive mode that would repeatedly be rehearsed in communications from India.³⁰ As Chaudhuri notes, the "technological superiority of Asian fabrics rested largely on human skills transmitted on the basis of hereditary knowledge"³¹; without access to the specifics of these technologies (due at once to their own failures of comprehension, the closed family or community systems within which these practices were handed down, and the efforts of Indian leaders

²⁹ Robert Orme, *Historical Fragments of the Mogul Empire* (London: C Nourse, 1783), quoted in Chaudhuri, *Asia Before Europe*, 298. Orme was an Anglo-Indian East India Company employee who worked in Kolkata and Madras before removing to England in 1760; his writings on India were highly regarded by British intellectuals. See the *Oxford Dictionary of National Biography*, s.v. "Robert Orme (1728–1801)," by SinhaRaja Tammita-Delgoda, last updated 2004, doi: 10.1093/ref:odnb/20833.

³⁰ See Sudan, especially 150-153.

³¹ Chaudhuri, *Asia Before Europe*, 313-314.

to keep such technologies exclusive to their own country's textile industry), British manufacturers were unable to appropriate Indian methods.³²

Orme's description, written in the wake of the British cotton manufacture's rapid series of successes, does more than simply dwell on Indian production techniques: with its emphasis on manual labour, and on the "simple" and "plain" tools that Indian textile labourers employed in their work, it also indicates the way in which English manufacturers began to try to make cotton production a domestic industry. In their attempts to emulate the superior quality of Indian cotton textiles, English manufacturers and inventors eventually discovered that the physical qualities of cotton fibres made them "peculiarly amenable to mechanical handling."³³ This fact, in concert with the difficulty of adopting Indian production techniques, and the increasing importance of mechanical technologies to English science, industry, and English subjectivity itself, meant that English efforts to engage in the production of fine cotton yarns and fabrics ultimately came to be based on mechanical innovation, resulting in the invention of technologies such as the jenny, the water-frame, and the mule. That is, the manner in which the English cotton industry came to be established—as one reliant on a series of mechanical technologies—was not an inevitable outcome borne of "progress," but the product of the specific set of historical, material, and ideological contexts detailed above. Moreover, the notion that a cotton industry based on mechanized production techniques was superior to one based on traditional Indian systems of production was very much not inevitable

³² Berg, "In Pursuit of Luxury," 123. As Lydia H. Liu shows, the same failures of observation and replication long stymied European attempts to manufacture porcelain. See Liu, "Robinson Crusoe's Earthenware Pot," *Critical Inquiry* 25, no. 4 (1999): 728-757, <http://www.jstor.org/stable/1344101>.

³³ Chapman, 53.

either: the English program of mechanical innovation was buttressed by a textual one that strove to declare the superiority of English production methods to Indian technologies of textile manufacture. In effect, this effort—carried out across a widespread series of writings—worked to speak the ascendancy of mechanized production into being. Orme’s description, which implies that Indian textile labourers’ work, though admittedly exquisite, is untechnological—and therefore primitive—because of its reliance on handwork and “simple” instruments, is only one example of this diffuse cultural project.³⁴ This project is itself merely one part of what Lydia Liu identifies as a wider “historical development” in the eighteenth century, through which “Europe’s increasing mastery of the technologies of other civilizations produced the very ground on which the primitiveness and backwardness of those civilizations would be mythologized.”³⁵ Like the seventeenth- and eighteenth-century European porcelain manufacture that Liu details, the cotton manufacture was one industrial site in an age when Britain “was modernizing itself in the arts, science, technology, and material culture, and did so by colonizing, appropriating, and (epistemologically) primitivizing the other civilizations”; and, like the fiction that European invention and ingenuity could independently produce “true porcelain,” the supposed preeminence of the mechanized British cotton manufacture was “the ideological effect of...storytelling.”³⁶

³⁴ Among other things, Orme’s description is deliberately misleading. Indian textile labourers employed technologies such as the spinning wheel and the treadle loom, which, though less mechanically intricate than something like the spinning mule, were not “simple” tools. Orme’s attention to handwork does reflect, however, the extent to which the excellence of Indian cloth depended on artisans’ extraordinary level of manual skill and control—one of the main nontransferable qualities of the Indian subcontinent’s textile manufacture. See Chaudhuri, *Asia Before Europe*, 313-318.

³⁵ Liu, 739.

³⁶ Liu, 746, 748.

This storytelling was engaged in most zealously in the print culture sparked by the English manufacture's rapidly expanding scope and scale. Through a series of popular works, which proliferated alongside English cotton textiles, the industry's mechanized expansion was described, explained, celebrated, and decried by a rogue's gallery of cotton and wool manufacturers, traders, weavers, consumers, and armchair analysts. Regardless of each author's position, however, a particular image of the Indian textile labourer and the manufacture in which she or he was engaged tends to emerge from this collection of writings, with the English industry standing as either an implicit or explicit contrast to it. In R. March's *A Treatise on silk, wool, worsted, cotton, and thread* of 1779, for example, a description of cotton wool explains that "the *East-India* wool is by far the most preferable, being finest, longest, and most durable when manufactured," and that

[n]o wool but yarn only is imported from the *East-Indies*, it being spun so very cheap by the natives, (from their manner of living on rice and water, and the fascination of their priests, whose dictates they implicitly obey) as not to exceed the rate of one penny per day.³⁷

Like Orme's account of Indian textile labourers, March's text concedes the finer quality of Indian cotton, but quickly locates this quality as the product of a population of unenlightened workers. March, by representing these workers as a collection of mindless drones, works to devalue the skills of Indian textile labourers even as he acknowledges them, making way for his assertion, two pages later, that

³⁷ R. March, *A treatise on silk, wool, worsted, cotton, and thread, describing their nature, properties and qualities, with instructions to clean the manufactures in the hosiery branch, And At The Same Time Preserve their Colour and Beauty* (London: J. Murray, 1779), 19, ECCO (CW3305798166).

Several machines have been invented to CARD and SPIN COTTON WOOL... one, the property of Mr. RICHARD ACKWRIGHT [*sic*] and Co. at Crumford, near *Matlock* in *Derbyshire*, turns out very advantageous; several thousand threads being spun at once by water, which will in time stop the importation from *India*.³⁸

The anonymous *A treatise on the cotton trade*, published in 1789 and supposed to be written by “Experience,” likewise relies on racist tropes to erase the skilled labour of Indian textile workers, contending that “The natives of India [are] *bigots* in religion, consisting of Gentoos and Mahometans. Religion *not* founded upon *reason*, naturally begets slavery: and wherever the human mind is enslaved upon *this* principle labour must be *cheap*.”³⁹ This erasure of labour is evident throughout the treatise, in passages such as those that describe Indian husbandry, or rather, its absence: the author claims that “In the East, the climate and soil is so favourable to its growth, that it may be produced in a *great measure*, without *care, trouble, or expence*,” and goes on to assert that one of the main varieties of cotton grown in India, “that from the *Cotton-tree*,”⁴⁰ is one that

requires *no culture*; it is in fact nature’s bounteous gift, at which even the prying and sagacious philosopher must be lost in wonder and amazement, and lead to adore that Divine Being, who has so wonderfully provided for the wants of all creatures. (20)

In this account, the Indian cotton industry is one that operates without the labours of cultivation, a process supposedly made unnecessary by the qualities of the subcontinent’s

³⁸ March, 21-22. March means to reference Richard Arkwright, inventor of the water-frame and other mechanized systems of cotton processing.

³⁹ *A treatise on the cotton trade: in twelve letters. Addressed to the Levant Company, West-India Planters, and merchants. By Experience*. (London: John Abraham, 1789), 21, ECCO (CW3303963193). References are to this edition.

⁴⁰ The author probably refers to *Gossypium arboreum*, a variety of cotton native to India and known for its resistance to drought and pests. See Venkatesh N. Kulkarni et al, “The Worldwide Gene Pools of *Gossypium arboreum* L. and *G. herbaceum* L., and Their Improvement,” in *Genetics and Genomics of Cotton*, ed. Andrew H. Paterson (New York: Springer, 2009), *SpringerLink* e-book, doi: 10.1007/978-0-387-70810-2.

climate and flora. These efforts to demonstrate that Indian cotton production and processing are carried out absent of any true labour culminate in the author's comparison between "an Indostan with all his *patient toil* and slavish labour, sitting in *placid quietude* under a shady tree, drawing and making a fabric of the produce of that soil of which he is born a native" and

a European possessed of *property* and aided by every *invention* of the *ablest mechanics*; the one by *force* and *power* of *water* upon a regular system, by means of a CHILD from a neighbouring workhouse, can attend the drawing of 150 to 200 threads, whilst the Indostan must be employed 365 days, to do that which a simple child, by means of mechanical invention, can do in ONE. (60)

While he does make reference to the Indian textile labourer's "*toil*," the author's image of the worker lounging under a tree insists that his (or her) actions are not really labour at all. This passage, like the ones quoted above, insists that the Indian textile labourer is unable to successfully perform the work of either cultivation or culture, deprived as he is by his religion of the capacity for reason. The British textile worker, in alliance with complex British machinery, is the one able to take up the neglected labour: work that, in combination with this technology, any English child is able to perform better than the Indian labourer. In this manner, the English cotton manufactory, "once very *inconsiderable indeed*," has become a "*great and extensive*" industry, and the English have moved "from being near *copyists*, and *imitators*" to "become *superior* to every other nation both in *fabric* and *invention*" (40). This supposed transcendence is entirely dependent on mechanical devices, as the author makes clear when he "hesitates not to assert" that the progress of the English cotton industry is "beholden to that great Prodigy in Nature, SIR RICHARD ARKWRIGHT" (40).

In this way, English mechanical and scientific systems are called on to differentiate English industry and its products from the work of Indian labourers, which is made inadequate to the newly twinned acts of manufacturing “*fabric*” and “*invention*.” In the treatise, Richard Arkwright stands as a synecdoche for English ingenuity, as an “*original genious [sic]*” who is compared to “that *great* and enlightened Englishman” Isaac Newton, who “explored the *heavenly bodies*, the *starry firmament*, the power of *gravity*, and the *force of attraction*” as Arkwright has the “*intricacies of mechanical movements*, and the power of that *useful* element, WATER” (40). As this comparison indicates, for “Experience,” the mechanized English cotton manufacture not only surpasses the Indian cotton industry, but also acts as a symbol of English ingenuity’s dominion over the universe it has apprehended. This emphasis on ingenuity reflects the term’s importance in seventeenth- and eighteenth-century thought, in which it “provided the foundation for the concept of intellectual labour” by signifying an intellectual experience in which the body and the senses were productively engaged.⁴¹ First exemplified by the Royal Society fellows’ empirical experimentalism, the term’s denotation of an embodied intellect—one bringing together, as John Evelyn put it, “the experienced hand and ingenious spirit”⁴²—meant that an engineer like Arkwright and natural philosopher like Newton could be linked as men able to comprehend (and thus manipulate) the intricacies of complex natural and artificial systems. The voice of “Experience” is supported by other writers, such as Robert Heron in a 1799 travel

⁴¹ Joanna Picciotto, *Labors of Innocence in Early Modern England* (Cambridge: Harvard University Press, 2010), 67.

⁴² Quoted in Picciotto, 69.

narrative that dwells on English industries and their progress. Heron, who I quoted above asserting that fine Indian cotton textiles long seemed “inimitable,” argues that “the Gentoo artisans are among the first in the world, for peaceful, painful industry, and for *artificial*, although not for *scientific* ingenuity” when he turns his thoughts to how such textiles are produced.⁴³ The fact that the Indian cotton manufacture lacks the “application of science to abridge the complex processes, and to improve the instruments of art” has made possible “the success of the cotton manufactures of Great Britain,” which, “[w]anting the advantages of the manufacturers on the east, and of the importers of their goods....formed other advantages....which soon enabled us to rival, and finally to excel them” (103, 107). Heron’s description of Indian labourers as possessed only of “artificial ingenuity” categorizes their industry as the province solely of what Evelyn would call the “experienced hand”; by contrast, British inventors and manufacturers are possessed of both mechanical skill and an “ingenious spirit.” This ingenuity makes the British cotton manufacture scientific, technological, and so inherently superior to the Indian techniques rendered proportionately *unscientific* and *untechnological*. Thus, according to Heron, Indian textiles and their production processes are no longer emblematic of a “state of very high perfection” unreachable by English manufacturers: instead, Indian fabrics can only be evaluated within a technological paradigm that produces their inadequacy (104). Through a literary mode Liu has named “the poetics of colonial disavowal”—which, as it celebrates European invention and produces Asian ignorance, “enacts a denial of those

⁴³ Heron, 102.

very aspects of [colonial] culture from which Europe has learned”— British ingenuity bypasses the problem of imitation by making the Indian cotton manufacture obsolete.⁴⁴

This mode operates in many other pamphlets and treatises, such as the anonymous *Case of the British cotton spinners and manufacturers of piece goods* of 1790. The author hearkens back to the days of the Calico Act, noting that at that time, “it was beyond the reach of human foresight to discover how it was possible to bring [the British] Manufacture to any degree of perfection at all.”⁴⁵ Since then, however, “The spirit, ingenuity, and enterprise of the British Cotton Spinners and Manufacturers” have produced “British Muslins, which, in the course of six years, have been brought to such a degree of perfection, as to compare in every respect with the best manufactured Muslins of India” (2). While this author at first seems to regard the British and Indian manufactures in terms of equality—stating, for example, that “*every species of Muslin can be made in any quantity, equal in quality, and as low in price as the Muslins of India were ever sold for at any period before the British Manufacture existed*” (2)—this is not the case. The pamphlet’s main argument is that India should export raw cotton rather than cotton fabric or yarn to Britain, since the cotton wool “could be raised with less labour to the Hindoos,” and would thus act as “resource for productive industry to the natives of India, exceedingly beyond the pitiful pittance which they obtain by spinning and

⁴⁴ Liu, 748-49. Liu’s argument specifically concerns *Robinson Crusoe*’s simultaneous evocation and disavowal of the Chinese porcelain manufacture when Crusoe independently produces an earthenware vessel on his island: “Whereas the [European] scientist unabashedly relied on industrial espionage or stolen specimens brought to Europe by sea merchants, Crusoe’s solitary experiment requires no external help. Was porcelain not a type of earthenware that a British man could have invented all by himself?” (738).

⁴⁵ *Case of the British cotton spinners and manufacturers of piece goods, similar to the importations from the East Indies* (London, 1790), 2, ECCO (CW107733659). References are to this edition.

weaving, in a country less adapted to Manufactures than to Agriculture” (5). The pamphlet’s laughable assertion—that the country that originated the industrialized manufacture of high-quality cotton textiles is actually unfitted for such work—is supported by years of popular media that laboured to make the laughable appear logical. By binding the cotton industry’s progress to scientific and technological ingenuity, this discursive project had made the manufacture, along with the terms by which it was possible to evaluate it, an English concern.

This association of British technological ingenuity with the country’s industrial, economic, and therefore national progress had wider effects. In works supporting the expansion of the mechanized cotton manufacture, commentators began to argue, as Dorning Rasbotham did in 1780, that “[i]t is the use of *Machines*, which chiefly distinguishes men in *society* from men in a *savage state*.”⁴⁶ This assertion, which once again implicitly contrasts the supposedly untechnological cotton manufacture of India with that of England, insists that civilized society is itself a state that depends on technological development. Thomas Bentley, in his *Letters on the utility and policy of employing machines to shorten labour* of the same year, echoes Rasbotham, contending that

[m]an has been defined many ways; and amongst the rest, he has been denominated a reasonable and a risible animal; but as most animals are found to be capable of some degree of reason, and some are thought to be almost as risible as himself, a *tool-making animal* or *engineer*, has by some been adopted as the best and most characteristic definition of man. And indeed how limited are the faculties of man, without the application of mechanical principles in the construction of tools and machines to shorten labour, and multiply and extend his powers? Without the aid of tools and machines, the condition of man would be

⁴⁶ Rasbotham, 7.

truly deplorable; he would be, in many respects, inferior to the beasts of the forest.⁴⁷

Rasbotham and Bentley evoke a vision of technological progress both Augustinian and Adamic. As Sawday explains, in *City of God*, Augustine took up the Biblical idea that technology was “the product of the Fall,”⁴⁸ and contended that “all the manifold inventions of human industry and ingenuity” made up “what he termed ‘a compressed pile of blessings.’”⁴⁹ These blessings were to be considered, Augustine wrote, “the consolations of mankind under condemnation.”⁵⁰ Augustine’s positive assessment of technology and his related “attitude of humility as to what man can accomplish without external aid” were both taken up by seventeenth-century English empiricists.⁵¹ With their interest in technologically mediated perceptual experiences, natural philosophers like the Royal Society fellows followed Bacon’s decree in *Novum Organum* that “The cause and root of nearly all evils in the sciences is this—that while we falsely admire and extol the power of the human mind we neglect to seek for its true helps.”⁵² This Augustinian mandate bound technological ingenuity to the advancement of both individual

⁴⁷ Thomas Bentley, Letters on the utility and policy of employing machines to shorten labour; occasioned by the late disturbances in Lancashire: to which are added some hints for the further extension and improvement of our woollen trade and manufactures, (London: T. Becket, 1780), 2, ECCO (CW3306707572). Robert Rix describes Bentley as a “political pamphleteer and religious controversialist” in William Blake and the Cultures of Radical Christianity (Burlington: Ashgate, 2007), 35. Bentley published a number of religious pamphlets as well as works written on behalf of labouring-class Britons, such as *The rights of the poor* (London, 1791), ECCO (CW105544528); *The poor man’s answer to the rich associators* (London, 1793), ECCO (CW104145428); and *A plain, humble, and earnest address to Parliament, in behalf of the poor and lower orders of British subjects; with a view to obtain an universal liberty of petition, a rational reform of Parliament, and a necessary division of farms, forests, and commons* (London, 1793), ECCO (CW104373592).

⁴⁸ Sawday, *Engines of the Imagination*, 19.

⁴⁹ Sawday, *Engines of the Imagination*, 19-20.

⁵⁰ Quoted in Sawday, *Engines of the Imagination*, 20.

⁵¹ Donald Greene, “Augustinianism and Empiricism,” *Eighteenth-Century Studies* 1, no. 1 (1967): 52, <http://www.jstor.org/stable/3031666>.

⁵² Quoted in Greene, 53.

understanding and the social good; so Robert Hooke could utopically claim, as I noted in my first chapter, that technologies would enable their British inventors and users to “recover some degree of those former perfections” lost in the fall “by rectifying the operations of the *Sense*, the *Memory*, and *Reason*.”⁵³ Joanna Picciotto emphasizes how this experimentalist paradigm identified Adam as “the only genuine representative of the human species—compared to whom, as John Donne put it ‘we are not men,’” and concurrently “defined fallen human beings as deficient, amputated creatures in need of prosthetic support,” which was now to be found in technological objects and processes.⁵⁴ This belief that technology could repair an Adamic body was always implicated in narratives of cultural progress, as Hooke’s contention that “the helps of Art, and Experience...make some Men excel others in their Observations, and Deductions, almost as much as they do Beasts” suggests.⁵⁵ Rasbotham’s and Bentley’s treatises push this suggestion further, contending that the use of machines was what distinguished English “society” from other, “savage” states. In their view, humanity itself is achievable only through a program of technological ingenuity and innovation.

Rasbotham’s and Bentley’s version of this Augustinian position draws out the implications of the contrasts English writers traditionally made between the English and Indian cotton industries: contrasts which, as we have seen, worked to strip Indian labourers of the related powers of “cultivation” and “culture.” Bentley’s assertion that man’s faculties are so “limited” without “the application of mechanical principles” that

⁵³ Hooke, *Micrographia*, v.

⁵⁴ Picciotto, 11.

⁵⁵ Hooke, *Micrographia*, v.

he is “inferior to the beasts of the forest” demonstrates how these arguments ultimately work to bind the progress of “culture”—which Johnson defines as connoting both “[t]he act of cultivation,” and, more generally, the “[a]rt of improvement and melioration”⁵⁶—to a trajectory of technological innovation. In this version of Augustine’s position, mechanical invention no longer denotes the promise of a future salvation; instead, it is a necessity if the process of enlightenment is to commence. Machines become engines that power a society’s deliverance from barbarity, and the possibility of “improvement and melioration” is foreclosed without them. As Bentley insists,

Read the history of mankind; consider the gradual steps of civilization from barbarism to refinement, and you will not fail to discover, that the progress of society from its lowest and worst, to its highest and most perfect state, has been uniformly accompanied, and chiefly promoted, by the happy exertions of man in the character of a *mechanic* or *engineer*. Let all machines be destroyed, and we are reduced in a moment to the condition of savages; and in that state man may indeed exist a long time, without the aid of curious and complex machines; though without them they can never rise above it.⁵⁷

By inextricably linking cultivation and technology, these treatises offer a vision of cultural and national progress in the genre that Ann Van Sant has labeled the “mechanic georgic.”⁵⁸ This genre was connected, as Picciotto shows, to seventeenth-century interest in portrayals of Adam as an innocent worker in Eden, now envisioned as a “georgic paradise”: experimentalist texts often referenced Adam digging with a spade as an “ingenious gardener,” the spade functioning as the “principall...instrument” of his paradisaical labour and symbolizing the separation of man from beast.⁵⁹ Adam’s spade was

⁵⁶ Samuel Johnson, *A dictionary of the English language*, Vol 1 (London: W. Strahan et al, 1756), ECCO (CB3331204400), s.v. “culture.”

⁵⁷ Bentley, 3.

⁵⁸ Ann Van Sant, “Crusoe’s Hands,” *Eighteenth-Century Life* 32, no. 2 (2008): 129.

⁵⁹ Picciotto, 70, 73

recreated in the innovations of British engineers, as the mechanic georgic collapsed technological ingenuity, mechanized labour, and the progress of civilizations together, locating the new georgic paradise they jointly offered in Britain. By comparison, the Indian textile manufacture, supposedly the product of manual labourers lacking reason and the assistance of technology, was not only fundamentally inferior, but also marked India as a primitive, uncultured, and barbaric state.

The arguments proffered in treatises that assert England's superiority as a manufacturer of textiles indicate the particular ways that this challenge to the Indian textile industry exceeded the economic terms upon which it was ostensibly launched. In concert with shifting ideas about the relationship between England and the east, as well as with England's increasingly aggressive project of colonial expansion in the Indian subcontinent, the mechanization of the cotton industry (and the ideological work that supported this process) reshaped British nationalism across the second half of the eighteenth century, organizing it around the figure of the ingenious machine. Initially employed by necessity in the face of superior Indian production techniques, mechanized technologies of textile production were subsequently assigned both an intrinsic supremacy and a unique relationship to Britishness itself, such that Britain could be proclaimed, by virtue of "its natural situation, from the natural Productions, and....the natural Vigour and Activity both of Body and Mind of its Inhabitants" to be "particularly adapted to the Cultivation, Study, and Improvement of Manufactures."⁶⁰ Rooted in

⁶⁰ This argument was made by the inventor Richard Arkwright as part of a legal case defending one of his exclusive patents. See Richard Arkwright and Co., *The case of Mr. Richard Arkwright and Co. In relation to Mr. Arkwright's invention of an engine for spinning cotton, &c. into yarn* (London, 1782), 1, ECCO (CW105341230).

Britain's traditional wool and linen industries, British textile production had long served to symbolize how, as David Hume put it, "*industry, knowledge, and humanity*, are linked together, by an indissoluble chain": Hume writes in the 1740s that "we cannot reasonably expect, that a piece of woollen cloth will be wrought to perfection in a nation which is ignorant of astronomy, or where ethics are neglected," and asks rhetorically, "Can we expect that a government will be well modelled by a people, who know not how to make a spinning wheel, or to employ a loom to advantage?"⁶¹ By the 1770s, spinning wheels and looms were not enough—after all, Indian textile workers employed them to an advantage that surpassed any British industry—and so machines like the spinning jenny and the water-frame were called on to produce both English cotton textiles and an imperially-oriented British identity that claimed technological innovation as one of its distinguishing characteristics.⁶² By declaring that mechanical ingenuity and enlightened civilization were inextricable from each other, the rhetoric that generated this identity was able to use British technology as a benchmark against which to measure the social progress of nations; unsurprisingly, any nation that was not Britain fell short. While it bolstered claims to British dominance, this rhetoric also made the reproduction of the

⁶¹ David Hume, "Of Refinement in the Arts," in *Essays Moral, Political and Literary* (Oxford: Oxford University Press, 1963), 277, 280.

⁶² Interestingly, textile historians have shown that the spinning wheel was originally an Indian technology. See, for example, Jane Schneider's "Rumplestiltskin's Bargain: Folklore and the Merchant Capitalist Intensification of Linen Manufacture in Early Modern Europe," in *Cloth and Human Experience*, ed. Annette B. Weiner and Jane Schneider (Washington: Smithsonian Institution Press, 1989), in which she argues that the first "technological innovation" to significantly affect the cotton industry was "the shift from distaff and spindle to the Indian-invented, foot-pedaled spinning wheel," which "transformed this industry in the twelfth century" (180).

nation and its supremacy inconceivable without the aid of technology—an imperative to which I will return later in this chapter.

Consider the spinster

In the twinned systems of textile production and nationalist redefinition established through mechanization, the labour of spinning raw cotton into thread became particularly important to England's claims to economic and cultural dominance. As mentioned above, new technologies of spinning were successfully developed long before mechanization spread to other tasks in the textile manufacture, such as, for example, weaving. These innovations in spinning were what powered the growth of the English cotton industry from the 1770s through the end of the eighteenth century, allowing for an exceptional speed and volume of production, and giving "a facility to human labour in [the] Manufacture, which is scarce conceivable."⁶³ As such, John Gladstone maintains in a treatise written in 1800, mechanized spinning was "the parent of almost every improvement in the manufacture.... the cause of its extent and prosperity, and the means by which [the] trade has been preserved, and new and valuable manufactures have been introduced."⁶⁴ Moreover, the act of spinning—"being," as Bentley notes, "one of the first

⁶³ *An important crisis*, 2.

⁶⁴ Mercator [Sir John Gladstone], *A second letter to the inhabitants of Manchester, on the Exportation of cotton twist* (Manchester: R&W Dean, 1800), 15, ECCO (CW105240444). Contemporary historians agree with Gladstone's assessment: Chapman, for example, writes that "Spinning by power commands more attention than any other technique because it set in motion a sequence of technical changes in connected branches of the industry" (22). Gladstone was a Liverpool merchant (and later baronet) who made a fortune trading American tobacco and grain, then turned to shipping insurance, real estate, and politics. He would later own sugar and cotton plantations in the West Indies. He wrote frequently as "Mercator," usually to defend his business interests. See the *Oxford Dictionary of National Biography*, s.v. "Sir John Gladstone, first baronet (1764–1851)," by H.C.G. Matthew, last updated 2004, doi: 10.1093/ref:odnb/10786.

stages of a manufactory, and coming next after the cultivation of the raw materials,”⁶⁵— became vital to the larger project of seizing the power of “culturing” from the Indian labourer and making it the sole property of English industry. Gladstone, who dwells on how, through spinning, “the value of the raw material, taken at a fair price, is more than doubled by being converted into yarn; in many cases it is trebled, and even quadrupled,”⁶⁶ expresses a widespread preoccupation with how the process of mechanized spinning imparted value to the cotton wool it twisted and stretched. So too does the anonymous author of a 1789 pamphlet marvel at how

the value of the finished [cotton] goods arises almost from labour alone, for the raw material bears no sort of proportion, when it is considered, that a single pound of fine cotton, worth five shillings, may be raised in value, so as to draw from foreign countries, or retain at home what otherwise would have gone abroad, a sum equal to from five to twenty guineas, and in some instances more money....⁶⁷

Another writer reflects, with added hyperbole, that through mechanization English workers “have recently been enabled, in some branches of this manufacture, to encrease the value of the raw material from one thousand to five thousand per cent.”⁶⁸ Such accounts of cotton spinning, which represent “the sublimation of mundane material into something with infinitely more value,” follow what Sudan identifies as an “alchemical pattern of turning the material into the sublime,” a discursive structure that recurs

⁶⁵ Bentley, 14.

⁶⁶ Mercator [Gladstone], 6.

⁶⁷ *Observations on the advantages which this country derives from a free and unfettered importation of the raw material of cotton wool* (London, 1789), 4, ECCO (CW106181149). The emphasis in this and other writings on the cotton industry on the conversion of raw materials into much more valuable products through mechanized labour reflects the growing influence of labour theories of value.

⁶⁸ *Considerations relative to a plan of relief for the cotton manufactory, by the establishment of a general hall, in the City of London, for the sale, by auction, at stated periods in the year, of the British cotton goods* (London, 1788), 7-8, ECCO (CW106712100).

frequently in eighteenth-century British accounts of Indian spaces and goods. “[A]lways attendant to the purification of a muddled substance,” alchemy was “a useful paradigm by which the English transformed a dark and impure land into pure wealth and the refinement of pure possibility.”⁶⁹ Spinning machines, as the material point of conversion between cotton wool and spun thread, were the catalyst in the British textile manufacture’s transmutation of crude material into refined product.⁷⁰ Returning over and over to this scene of transmutation, these commentators’ reflections—with their fixation on the spoils of converting the “raw” into “*wrought goods*”⁷¹—indicate how the process of turning cotton wool into thread became a potent metaphor for the process of “cultivation” or “culturing” over which England desired exclusive control. Spinning was key to both the economic and the ideological project of mechanization, and so too, in myriad ways, was the person whose embodied labour facilitated it: the spinster. This section therefore explores the complex ways in which the English cotton industry both relied on and disavowed the female textile labourers who performed the conversion from raw to wrought.

⁶⁹ Sudan, 164.

⁷⁰ There were a number of other manufacturing processes involved in this transformation that preceded spinning (including carding, combing, and drawing), but, as these accounts show, spinning was seen to mark the point of definitive transformation from raw material to wrought product.

⁷¹ *A Treatise on the Cotton Trade*, 36.



Figure 20: Detail from f. 1 of the Winchester Psalter (c. 1150-1250), “Adam and Eve Working,” which shows Adam digging with a spade and Eve spinning with a distaff. Image via the British Library, http://www.bl.uk/manuscripts/FullDisplay.aspx?ref=Cotton_MS_Nero_C_IV.

In England, as in the rest of Europe, spinning had long been women’s work. A spinster of the eighteenth century characterized her work as “a right that had descended to [women] thro’ their predecessors from the earliest period of time,”⁷² and, while Adam was often represented labouring with a spade, the same representations show Eve spinning with a distaff upon her expulsion from Eden (see fig. 10).⁷³ The reasons for this gendered division of labour are now difficult to name with certainty (since, as representations Eve spinning show, by the eighteenth century it had been naturalized for

⁷² The unnamed spinster is quoted in William Radcliffe, *Origin of the New System of Manufacture commonly called Power Loom Weaving* (1828; Clifton: A.M. Kelly, 1974), 61-2.

⁷³ See Picciotto, 41-45. She writes that “Scenes of angels giving tools to Adam and Eve, or instructing them in the arts of digging and spinning, were an English specialty” (42); the image from the Winchester Psalter in fig. 10 is only one example.

centuries), but scholars have offered some theories. Maxine Berg points out that spinning—especially spinning with a distaff, an easily portable tool—was work that could be done while “walking, talking, tending animals or watching over children,” and that spinning therefore “occupied hands otherwise unoccupied, or left other parts of a woman’s body free for yet more work.”⁷⁴ Kathryn Sutherland agrees that spinning was seen as a task that “women could attend to...alongside or in the intervals from other labours,”⁷⁵ while Sawday links spinning more closely with reproductive labour, asserting that “women were assigned to this kind of textile work in pre-industrial societies in order to ensure that the productive labour of women would not be lost during their child-bearing years.”⁷⁶ As these critics suggest, the ease with which spinning could be integrated into the already heavily burdened daily lives of labouring women may have been what led to its feminization. Further, the specific qualities of spinning—its painstaking precision, its repetitive nature, and the way in which this repetition was thought to render it a task that made “small demand...on eye or thought”⁷⁷—are all attributes long associated with women labourers, who were often delegated work with such “female characteristics.”⁷⁸

Though these theories give us a number of contexts for the ways in which spinning was linked with female labour, it is ultimately difficult to determine whether these contexts originated this gendered division; it seems more likely that spinning,

⁷⁴ Berg, *The Age of Manufactures*, 140-143.

⁷⁵ Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations*, A Selected Edition, ed. Kathryn Sutherland (Oxford: Oxford University Press, 1998), 116n.

⁷⁶ Sawday, *Engines of the Imagination*, 146.

⁷⁷ Alice Clark, quoted in Sawday, 146.

⁷⁸ Berg, *Age of Manufactures*, 152.

because it was performed largely by women, came to be seen as a transient and inexpert kind of work. What is certain is that, in eighteenth-century England, spinning was an undervalued labour. Sources show us that women spinning wool, flax, and cotton through the seventeenth and early eighteenth century were paid a pittance for the thread they produced.⁷⁹ Spinning's long-held status as an ill-paid, feminized occupation made a population of skilled, economically disempowered female workers available to the mechanizing cotton manufacture. As Bridget Hill notes, for manufacturers who required a "plentiful, cheap, and unrestricted labour force," laboring-class women presented a "highly exploitable body of labour."⁸⁰ Mary Jo Maynes points out that "new technologies that revolutionized textile production beginning in the eighteenth century were developed with an eye toward a potential workforce that was imagined as young and feminine."⁸¹ This becomes particularly evident when we consider that the first significant development in mechanized cotton technology—the spinning jenny—was, as Berg explains, "first invented for use by a young girl, its horizontal wheel making it uncomfortable for an adult worker to use for any length of time."⁸² The fact that these early machines were quickly modified for use by adult women, while men seldom came to operate spinning jennies, shows that was not only young women who were imagined as the operators of

⁷⁹ Maxine Berg notes that "[spinners] right across the country were invariably amongst the lowest-paid of workers" (*Age of Manufactures*, 139-140).

⁸⁰ Bridget Hill, *Women, Work, and Sexual Politics in Eighteenth-Century England* (Oxford: B. Blackwell, 1989), 46

⁸¹ Mary Jo Maynes, "Gender, Labor, and Globalization in Historical Perspective: European Spinners in the International Textile Industry, 1750-1900," *Journal of Women's History* 15, no. 4 (2004): 54-55, doi: 10.1353/jowh.2004.0016.

⁸² Maxine Berg, "What difference did women's work make to the industrial revolution?" in *Women's Work. The English Experience, 1650-1914*, ed. Pamela Sharpe (London: Arnold, 1998), 161.

new textile technologies. Women's long involvement in the labour of processing fibre into thread, alongside the extremely low wages they could acceptably be paid—as Amy Clark observes, women workers in the textile industry “were often paid less than subsistence wages, for it was assumed that they were subsidiary workers whose chief value lay in providing domestic services”⁸³—meant that women's labour in the mechanized textile industry was not only “necessary and accepted,” but, in fact, “indispensable.”⁸⁴ Gladstone's treatise of 1800 estimates, for example, that of the “upwards of 76,000 hands” employed in spinning cotton, “[o]nly one eighth are men,” with “the remainder consist[ing] of women and children,”⁸⁵ while the anonymous *Case of the British Cotton Spinners* of 1788 maintains that the cotton manufacture employed at least 110,000 women.⁸⁶

Women's labour was indispensable to the industry in less readily visible ways as well. S. D. Chapman attributes the success of early, mechanized cotton processing machinery to the fact that “spinning was traditionally a simple handicraft consisting of only two motions, stretching then twisting the clean combed cotton fibres, and it proved relatively easy to imitate this activity with a machine.”⁸⁷ Chapman's representation of spinning as a “simple handicraft” uncritically echoes eighteenth-century attitudes about

⁸³ Amy Clark, *The Struggle for the Breeches: Gender and the Making of the British Working Class* (Berkeley: University of California Press, 1995), 14. The characterization of women's work in the mechanized textile industry as “subsidiary” to their domestic labours (and therefore poorly compensated) is clearly derived from the ways in which hand-spinning had historically been understood.

⁸⁴ Clark, *Breeches*, 20, 24.

⁸⁵ Mercator [Gladstone], 5.

⁸⁶ *Case of the British cotton spinners*, 7.

⁸⁷ Chapman, 17.



Figure 11: Via Aspin and Chapman's *James Hargreaves and the Spinning Jenny*, a photograph of a jenny "reconstructed from James Hargreaves's patent specification of 1770" in the 1960s (1). The spinster's left hand holds the draw bar. Subsequent models of the jenny would replace the horizontal spinning wheel with a more efficient vertical one.

the (lack of) skill required to successfully spin thread—in fact, a thread's quality directly reflected its spinster's dexterity, as Chapman himself acknowledges when he explains that a given thread's fineness "depended on the delicacy of the touch of the spinner."⁸⁸

⁸⁸ Chapman, *The Cotton Industry*, 21.

Nevertheless, Chapman's account of the spinning jenny's replication of the spinster's movements alerts us to the ways in which Britain's attempt to rival the Indian cotton industry was premised on a mechanical reproduction of the British, labouring female body. The jenny, which "Hargreaves based...on the one-thread spinning wheel," but which "substituted for the spinner's left hand a draw bar made from two horizontal pieces of wood between which several threads could be clasped at the same time"⁸⁹ (see fig. 11), functioned in a way that replicated and refracted the motions of the spinster's body to twist 12, 18, 36, 72, or 120 threads simultaneously, in the same manner that the hand-spinner twisted one.

A description of the jenny's invention in Maria Edgeworth's *Harry and Lucy Concluded* foregrounds both these mimetic qualities and their conflicted nature. Edgeworth's didactic work, which sought to encourage children "to exercise the powers of attention, observation, reasoning, and invention"⁹⁰ (that is, of ingenuity) by offering accessible accounts of scientific and technological innovations, is framed as a series of educational conversations, either between the young Harry and his still younger sister Lucy, or between the two children and their parents. In the discussion of the jenny, the children's father describes the "simple but tedious mode" of spinning with the distaff and with the spinning wheel (84), then recounts how Hargreaves (here called "Hargrave") noticed that,

⁸⁹ Aspin and Chapman, 42. As fig. 11 shows, the spinster's left hand still operated the draw bar, even as it took over the work of holding the thread, just as her right hand operated the wheel that added twist to it.

⁹⁰ Maria Edgeworth, *Harry and Lucy Concluded; Being the Last Part of Early Lessons* (London: R. Hunter, 1825), vi. References are to this edition.

[a]s but little strength was employed in drawing out the cotton thread, or in turning the spindle which twisted it, he perceived, that if one woman had ten pairs of hands and ten spindles, and could move them at once in the proper direction in drawing out the cotton thread, she could spin ten times as much in the same time. (85)

A reply by Lucy reveals how the quest to engineer a woman with ten pairs of hands was one that took the power of spinning thread out of the hands of women. Lucy, who interjects, “[i]f the woman had a hundred spindles, and a hundred hands, like Briareus, she might have spun a hundred times as much,” is corrected by her father: “[n]ot unless she had known how to use her hundred hands,” he contends, since “hands without head would do little” (85). Like Chapman, the father devalues spinsters’ skills: they are able to carry out the “simple” task of drawing out single cotton threads, but, he implies, this process is one disconnected from rational thought, and spinsters thus lack the “head” to perform more complex operations. Instead, it is Hargreaves who possesses the “one head” that “contrived to supply the place of many hands” (85). As the father’s lesson shows, while Adam’s paradisaical manual labour—which links head and hands through a technological implement—is recuperated in the mechanical work of men like Hargreaves, Eve’s labour at her distaff is not: instead, manual spinning (like the work of Indian textile workers) is positioned as the antithesis of ingenuity. Through mechanization, the spinster’s skill, located (only) in her hands, is thus doubly appropriated: first by Hargreaves, whose “observing mind” discovers a way to replicate and multiply the spinster’s motions, and then by the jenny itself, which replaces the “many hands” whose function it reproduces.

The jenny's name is suggestive of its complicated representational relationship with the labouring-class female body. The reason for this name's assignment now seems lost, but the apocryphal stories that remain to explain it are interesting. One stems from common account of the jenny's invention, a version of which is repeated in Edgeworth's text. Harry and Lucy's father explains that the machine's action was "suggested to Hargrave [*sic*] by an accident," when he witnessed someone accidentally "[overturn] the wheel at which [his] wife was spinning wool" and realized the possibilities of constructing a spinning machine with the kind of horizontal wheel utilized in the jenny (86).⁹¹ The attribution of the moment of invention to this accident involving his spinster wife, whose name Lucy supposes "was Jenny," highlights the way Hargreaves' invention will come to reproduce her. The father describes how, after the wheel is overturned, "[t]he thread remained in her hand, and the spindle was then perpendicular, and the wheel horizontal.... it continued to turn round with the motion which had been given to it, and kept the spindle in motion," thereby spinning the thread. His wife—a spinning Jenny—here holds the twisting thread precisely as Hargreaves' other jennies soon will, her single hand patterning these machines' ever-multiplying facsimiles. In this story, the machine's assumption of the spinster's name appears to offer tribute to its original, but actually dramatizes how the invention's acts of reproduction supersede the female textile labourer upon which it is modeled, claiming even her name.

⁹¹ Though this story is frequently repeated in accounts of the jenny's invention and naming through the eighteenth and nineteenth centuries, Hargreave's wife was actually named Elizabeth. See *The Oxford Dictionary of National Biography*, s.v. "James Hargreaves (*bap.* 1721, *d.* 1778)," by Christopher Aspin, last modified 2004, doi: 10.1093/ref:odnb/12316.

Scholars of textile history prefer the explanation that the jenny's name is, as Aspin and Chapman contend, "an old word for engine."⁹² The idea is plausible—the cotton gin's similar name, for example, is demonstrably derived from the word "engine,"⁹³ and "jenny" is occasionally rendered as "jinny" in eighteenth-century texts⁹⁴—but remains speculative and unproven. Though Aspin and Chapman (and the scholars who follow them) do not acknowledge it, this account of the name's meaning represents the confluence of a corruption or diminutive of the word engine with a word that was both a common name for labouring-class women and a signifier of femininity more generally. As the *Oxford English Dictionary* records, the name "Jenny" serves as "a feminine of Jack," and is thus "used as a feminine prefix" in the same manner that the masculine Jack is; jenny, for example, denotes "a female animal, as jenny-ass, and *esp.* in names of birds, as jenny-hooper, jenny-howlet."⁹⁵ If the jenny's name is derived from the word engine, the choice of the diminutive "jenny" (rather than something like the more generic "gin") signals a perception of the engine's action as inherently feminine. While the machine's work of spinning was, as I have discussed, a paradigmatically feminized task, the nature of the jenny's action may have other links to the female labourer's work. As I mentioned above, during the eighteenth century women's labour was thought to be best suited for tasks that were unskilled. As Berg explores in *The Age of Manufactures*,

⁹² Aspin and Chapman, ii.

⁹³ *Oxford English Dictionary Online*, s.v. "gin, n.1," last updated December 2014, <http://www.oed.com/view/Entry/78357>.

⁹⁴ See, for example, the anonymous *Considerations relative to a plan of relief for the cotton manufactory* (London, 1788).

⁹⁵ *Oxford English Dictionary Online*, s.v. "jenny, n.," last modified June 2014, <http://www.oed.com/view/Entry/101050>. I thank Jacqueline Langille for this insight.

women were sought out for “tedious, laborious” work that required “special application” and was characterized by “deftness,” “delicacy,” and “repetition,” attributes that, as “female characteristics,” were “never regarded as skilled in their own right.”⁹⁶ This kind of work, supposedly requiring repetitive, intricate physical action but not mental engagement, could itself be described as mechanical: that is, “acting or performing without thought; lacking spontaneity or originality, automatic, routine.”⁹⁷ This sense resonates with the historical designation of “mechanick” as a name for a “servile” worker “of mean occupation,”⁹⁸ an identity linked with the Aristotelian position that “theoretical knowledge is superior to productive knowledge” and that “the manual laborer works without knowing why he works.”⁹⁹ While seventeenth- and eighteenth century concepts of ingenuity recuperated some kinds of manual labour as honorable and intellectually productive, as we have seen, the spinster’s was not among them. Women’s labour, thus conceived of as a collection of automatic actions, was easily appropriated by the action of a feminized machine.

Though I have dwelt on the jenny thus far, it was not the only kind of spinning machinery structured by its imitation of the labouring woman’s body and motions. In *Harry and Lucy Continued*, the children’s father explains that the jenny was eventually eclipsed by Arkwright’s water frame because the “cotton thread spun by the jenny was found to be rough, spongy, and weak” (87), and accordingly suitable only for use as weft.

⁹⁶ Berg, *Age of Manufactures*, 152.

⁹⁷ *Oxford English Dictionary Online*, s.v. “mechanical, adj. and n.” last modified September 2014, <http://www.oed.com/view/Entry/115544>.

⁹⁸ Samuel Johnson, *A Dictionary of the English Language*, Vol 2 (London, W. Strahan et al, 1756), ECCO (CB131205008) s.v. “mechanick.”

⁹⁹ Van Sant, “Crusoe’s Hands,” 121.

These deprecated qualities of the jenny-spun thread stemmed from “the fibres of the cotton not being laid smooth and parallel to each other, while it was drawn out and twisting” (87). More accurately, the failures of the spinning jenny derive from not reproducing the spinster’s actions closely enough, as the father makes clear in this address to his daughter:

In spinning by hand, Lucy, you recollect seeing the spinner not only draw the thread out, but press and move it at the same time, between her finger and thumb. This smoothed the fibres of the cotton, and kept them parallel with each other. Now this was wanting in the spinning jenny. The motion of the hand in drawing out the thread was well imitated by the rulers or clasps, which, holding it fast when drawn back, answered the same purpose; but the motion of the spinners fingers and thumb, and the effect produced by it, was to be supplied.

Arkwright’s water frame addressed this stubborn insufficiency by abandoning the jenny’s “ruler” and instead “passing [the cotton] successively between three pairs of rollers” (see fig. 12), thereby producing a smoother, stronger thread—or, as Lucy puts it, the water frame “did by the use of rollers what a woman did at first by the motion of her finger and thumb” (87). Her brother’s response admits the centrality of the spinster’s embodied skill to Arkwright’s enterprise even as it works to refuse it: “Yes,” Harry says,

but consider how much more was done in the same time, in one day perhaps, by the rollers, than a woman could do in her whole life spinning. And how difficult, and how very ingenious it was, to imitate by machinery that motion of the finger and thumb. (88)



Figure 12: Prototype of Arkwright's water-frame. The rollers are visible at the top of the apparatus. Image via the Science Museum, London: <http://www.sciencemuseum.org.uk/images/1008/10226385.aspx>

Harry's rejoinder, with its facile dismissal of the fruits of a spinster's "whole life" of labour, reprises his father's devaluation of women's hands in favour of men's heads, and the cunning devices that spring from them. As Harry's response teaches Lucy, it is not the ability to perform complex, highly skilled labours that is important: rather, it is the ability

to reproduce these motions mechanically, in a “very ingenious” manner.¹⁰⁰ In the context of a nationalist manufacture that clung to technological innovation as the sign of its innate superiority, the labouring female body was thus rejected even as it was seized on to pattern and power mechanized production methods.

Accordingly, traditional hand spinning techniques, which had long been overlooked and ill-remunerated, were now singled out for deprecation as primitive, obsolete crafts. Bentley, for instance, in his discussion of distaff spinning, remarks that “it was practiced by the most ancient nations,” and “is still practiced in some half-civilized countries, or such as have little commerce.” While he acknowledges that he believes it is “yet known in the county of Norfolk,” this is an anomaly, as “this and all other methods of spinning, without great advantages from machines, are incompatible with the present.... way of living in this country, and the existence of our commerce.”¹⁰¹ In fact, as Berg shows, distaff spinning remained common in England “long after the introduction of spinning wheels and even spinning jennies,” both because thread spun by this method could be made exceptionally fine, and because it was able to “tap labour not otherwise in use—that of feeble old women and young children, and the hands of women not otherwise in use when walking, talking, tending animals or watching over children.”¹⁰²

¹⁰⁰ This privileging of intellectually mastering complex labours over the actual work of the “mere” manual labourer is driven by the same impulse that made trade histories and manuals—such as Moxon’s *Mechanick Exercises*, published under the auspices of the Royal Society—popular among bourgeois and aristocratic readers. See Van Sant, “Crusoe’s Hands,” 121-122. As James Robert Wood (paraphrasing John Barrell) puts it, it was believed that, “Because he did not work in a particular trade or profession, the gentleman could discern the hidden coherence behind the welter of occupations and supply the stable perspective from which to see how they were all related to one another.” See “Richardson’s Hands,” *Eighteenth-Century Fiction* 26, no. 3 (2014): 335, doi: 10.1353/ecf.2014.0012.

¹⁰¹ Bentley, 14.

¹⁰² Berg, *The Age of Manufactures*, 140.

This craft is nonetheless irreconcilable with Bentley's vision of the nation as a "highly improved, civilized, and commercial" state—one for which "machines for expediting labour are *absolutely necessary*."¹⁰³ The continuance of distaff spinning in England is made invisible by Bentley, not simply (as was traditional) because of its designation as feminine, but because it was now seen as appropriate only for "half-civilized" societies, and could not be admitted by the newly mechanized nation. Dorning Rasbotham similarly associates the "*Spinning Wheel, with one Spindle*" with a primitive past, explaining that though it was mistakenly "considered for many years, as the highest point, to which human art could go," "[t]he late improvements" have made it "almost useless."¹⁰⁴ Though, like the distaff, the spinning wheel remained in widespread use through the nineteenth century, Rasbotham asserts that it has been made obsolete by an industry "*astonishingly improved and extended*" through "our *machines* in spinning, warping, weaving, dressing, dying, &c. &c." These improvements are such that "a weaver or tradesman, who lived a *hundred years ago*, in this country.... would *hardly know* the manufacture."¹⁰⁵ Rasbotham's description neatly marks mechanization as a decisive break with the past, and consigns all skills and labours unassociated with it to history. In this way, Bentley and Rasbotham work to maintain Britain's place at the pinnacle of the technological progress of nations, erasing aspects of the British textile industry that complicate this claim to supremacy.

¹⁰³ Bentley, 3.

¹⁰⁴ Rasbotham, 8.

¹⁰⁵ Rasbotham, 8.

Many commentators joined Rasbotham in dismissing outright the use value of traditional textile production techniques, and those who performed them. An anonymous author writes in 1788 that “[t]he cotton manufacture is perhaps, of all others, that branch of the trade which is of the greatest importance in a national point of view,” owing to the fact that “it consists of *labour alone*, performed, in a great measure, by women and children, whose industry had been hitherto unproductive.”¹⁰⁶ Likewise, the author of the 1789 *Observations of the Advantages* (who I quoted above marveling at the measure of value able to be gained through the process of refining raw cotton wool into thread) is particularly captivated by the fact that this value is added “principally from the labour of women and children, who formerly produced little to the state, and were in many instances a burden.”¹⁰⁷ Gladstone concurs that “by means of this manufacture,” women and children “are able to maintain themselves comfortably, and many of them would, without this resource, be useless, if not burthensome to the public.”¹⁰⁸ Again, these claims are easily refuted: spinsters (and their children) who processed fibre by distaff or wheel had always been an integral part of the wool manufacture, the quintessential national industry regarded as “the Flower and Strength, the Revenue and Blood of *England*.”¹⁰⁹ Within the context of the textile manufacture’s mechanization, however, work carried out by hand was unable to be recognized as labour, since Britain’s claim to industrial superiority was premised on a systematic devaluation of the hand labour carried out by

¹⁰⁶ *Considerations relative to a plan of relief for the cotton manufactory*, 7.

¹⁰⁷ *Observations on the advantages*, 4.

¹⁰⁸ Mercator [Gladstone], 5.

¹⁰⁹ John Smith, *Chronicon rusticum-commerciale; or, memoirs of wool, &c. Being a collection of history and argument, concerning the woollen manufacture and woollen trade in general* (London: T. Osborne, 1747), 1:197, ECCO (CW124804834).

Indian textile workers, such that this labour was ultimately emptied of all productive power. Women's labour in the British textile industry, therefore, was only perceptible when it was assisted by machinery: lacking technological aid, their labours also lacked utility. The spinster's work of processing raw fibre—a task essential to Britain's claims to economic and cultural superiority—was suddenly unimaginable without the “combination of human labour with ingenious machinery.”¹¹⁰

In this way, the power of spinsters' labour was claimed by the technologies that reproduced it: only by joining with these “mechanical agents,”¹¹¹ it seemed, could women complete the tasks traditionally considered their lot. And, in this moment in which technological innovation was embraced as the mark of British supremacy, spinning thread was not the only embodied labour that was perceived to be enabled by machinery. We can begin to see this in an anonymous 1788 treatise, whose author believes that the significance of the cotton industry “to the public at large as a source of extensive revenue and national strength,” through “the augmentation of trade, created by this astonishing combination of human and artificial labour,” can “scarce be supposed to have made an impression equal to the importance of the object,” because, as he argues, “[c]omparatively speaking, no manufacture that ever was introduced into any country has been so advantageous to the state.”¹¹² One reason for his belief in the importance of the industry is that, while “[t]hese artificial powers produce what is equal to *a great encrease of people usefully employed*,” at the same time, “[t]he people themselves, fostered as it

¹¹⁰ *An important crisis*, 1.

¹¹¹ Mercator [Gladstone], 15.

¹¹² *An important crisis*, 1, 6.

were by the resource derived from such power, multiply beyond the common ratio.”¹¹³ In this description, innovations in textile technology proliferate more than just mechanical imitations of labouring hands. The technology’s generative power extends to the body that operates it, enabling its reproductive capability and so producing more labourers: children that “formerly subjected the country to a great expence in rearing to maturity,” but are now able to “add to the riches of the family.”¹¹⁴ Textile machines, which derived their productive ability by appropriating the capacities of the labouring female body, have here assumed what Defoe identified as that body’s “great Use”: to “supply [the community] with Members that may be serviceable, and keep up a Succession.”¹¹⁵

As in the production of spun thread, the machine’s facilitation of generation ultimately wrests this power from the labouring body. Bentley makes this clear when he pauses to refute the anti-technological position that “machines may be unfavourable to population.”¹¹⁶ On the contrary, he argues, machines make it possible for the earth to be “forced to produce more food and raiment, as well as materials to shelter the inhabitants from the inclemency of the weather,” and consequently for countries to “become more populous.” “If anyone can doubt the truth of this conclusion,” Bentley declares, “let him look for a confirmation of it, where there are the fewest machines, in the almost depopulated state of savage countries.” As an example, Bentley offers the land of “*New*

¹¹³ *An important crisis*, 6.

¹¹⁴ *An important crisis*, 6.

¹¹⁵ Defoe, *Some considerations upon street-walkers, with a Proposal for lessening the present Number of them* (London: A. Moore, 1726), 6, ECCO (CW104790053). The pamphlet’s attribution to Defoe is in dispute.

¹¹⁶ Bentley, 16. It appears that Bentley is responding to an argument made in a specific text or texts, but he does not specify which, and I have as yet been unable to trace these possible sources.

Holland” (present-day Australia), which, though “perhaps as large as all Europe, and some parts of which are situated in one of the finest climates in the world,” he supposes “does not contain as many inhabitants as the smallest of those kingdoms or states into which our continent is divided”; moreover, “even those few inhabitants are in a condition little superior to brutes.” Bentley concludes by advising that “[i]nstead of supposing....that the *use* of machines is in any case unfavourable to population, it would be much more reasonable to conclude, that *nations are populous in proportion as they make use of machines.*”¹¹⁷ Bentley’s rejoinder links his investment in the technological progress of civilizations—his conviction that “[w]ithout the aid of tools and machines, the condition of man would be...inferior to the beasts of the forest”—to a belief that technological power is implicated in the process of fostering human life. According to Bentley’s view, technology is not only vital to the development and reproduction of civil societies, but to the reproduction of civil (or civilizable) bodies themselves.

Bentley’s treatise, as well as the anonymous text quoted above, do not appear to describe the intervention of mechanism into reproduction in gendered terms: it is not women specifically, but rather “[t]he people” whose generative capacity is “fostered” by technological innovations. This more general ascription of reproductive power aligns with eighteenth-century theories of reproduction, which, though varied and often conflicting, always tended to ascribe generative functions to both men and women.¹¹⁸ A number of contexts for these authors’ assertions about the importance of technology to

¹¹⁷ Bentley, 17 (emphasis in original).

¹¹⁸ See Keller’s *Generating Bodies and Gendered Selves* for an analysis of early modern theories of reproduction, and how they variously implicated the gendered body.

the national body, however, are important. I quoted Sawday above, arguing that the traditional gendered division of labour in the domestic textile industry arose from the ease with which the task of spinning could be integrated with the consuming labours of childbearing and childrearing. Ivy Pinchbeck, in the classic study *Women Workers in the Industrial Revolution*, likewise asserts that women's work completing such "preparatory processes" was usually joined with the labour of "the training and setting to work of the children."¹¹⁹ A woman's work refining raw fibre was only a part of her larger social responsibility to cultivate productive citizens. To this task her distaff or wheel was a constant accompaniment and also, as she trained her children in domestic labours such as processing thread, a key tool. An axiom reproduced in the 1742 *Compleat Collection of English Proverbs*—that "the foot on the cradle and hand on the distaff is the sign of a good *housewife*"—captures how the labours of spinning and reproduction were linked through the spinster's body.¹²⁰ So strongly were the spinster and her implements associated with this work of physical and ideological reproduction that, as Deborah Valenze shows, the word distaff "came to represent the female side of the family,"¹²¹ or, as Sawday puts it, became a means of "describing matrilineal lines of descent,"¹²² tracing the inheritance of these labours. And, as Perry has argued, the reproductive labours of the distaff side became increasingly imperative to the power the British state over the course of the eighteenth century, in light of "the new political and economic imperatives of an

¹¹⁹ Pinchbeck, 113

¹²⁰ John Ray, *A compleat collection of English proverbs; also the most celebrated proverbs of the Scotch, Italian, French, Spanish, and other languages*, 3rd edn (London: H. Slater, 1742), 11, ECCO (CW3316642785).

¹²¹ Deborah Valenze, *The First Industrial Woman* (Oxford: Oxford University Press, 1995), 68-69.

¹²² Sawday, *Engines of the Imagination*, 143n52.

expanding English empire.”¹²³ These imperatives were ones that required an unprecedented number of British bodies: in 1759, Jonas Hanway warned that “It seems to be a general opinion, that we *want people*... considering our *extensive commerce*; the smallness of this island compared with his Majesty’s dominion’s abroad; and the *formidable* neighbor [France] who is *ever meditating our humiliation*,” and that “we had need to promote population by all rational and pious means.”¹²⁴ It is “*Increase alone*,” Hanway asserts in a later work, which “can make our *natural* Strength in *Men* correspond with our *artificial* Power in *Riches*, and, both with the Grandeur and Extent of the *British Empire*.”¹²⁵ In this context, Perry argues, motherhood was ultimately constructed as “a production-gearred phenomenon analogous to the capitalizing of agriculture, the industrializing of manufacture, and the institutionalizing of the nation-state,” as women’s bodies were tasked with engendering useful citizens to populate and defend the expanding spaces of British rule.¹²⁶ The logic of proliferation at play in Bentley’s insistence that “*nations are populous in proportion as they make use of machines*” therefore implicates the female body (and, more specifically, the female textile worker), in particularly imperative ways. The machines that, with their curious toil, had culled from spinsters’ embodied labour the “*artificial Power*” of refining thread, likewise derived from her body the ability to foster “*a great encrease of people usefully*

¹²³ Ruth Perry, “Colonizing the Breast: Sexuality and Maternity in Eighteenth-Century England,” *Journal of the History of Sexuality* 2, no. 2 (1991): 206, <http://www.jstor.org/stable/3704034>.

¹²⁴ Jonas Hanway, *A candid historical account of the Hospital for the reception of exposed and deserted young children* (London, 1759), 10-11, ECCO (CW3305578197).

¹²⁵ Jonas Hanway, *Serious considerations on the salutary design of the Act of Parliament for a regular, uniform register of the parish-poor in all the parishes within the Bills of Mortality* (London: John Rivington, 1762), 26, ECCO (CW3304642926).

¹²⁶ Perry, “Colonizing the Breast,” 206.

employed.” Textile machineries, establishing “nurseries of industry,”¹²⁷ which, as Gladstone believes, made sites of manufacture “schools” teaching “order,” “diligence” and “cleanliness” to “the young” whom they employed,¹²⁸ appropriated the power of cultivating useful citizens.¹²⁹ Women must therefore set aside the distaff and turn to more ingenious technologies to effectively propagate the nation.

The British textile industry’s mechanization, as a material and discursive project, therefore repeatedly co-opted the labouring female body’s power and abilities in service of Britain’s pursuit of global supremacy. This process of appropriation was one that ultimately denied the female body access to the capacities derived from it (at least without the mediation of technology) in order to establish a nation defined and driven by masculine ingenuity. The way in which this process alienated women from their labour’s productive power can be traced in the shifting connotations of the term “spinster” across the early modern period. While, since the medieval period, the word had denoted any woman who “practis[ed] spinning as a regular occupation,”¹³⁰ Amy Froide explains that

¹²⁷ Wright, *An address*, 19. Wright’s use of the term “nursery” evokes both the cultivation of children and the cultivation of plants: see, for example, Hume’s assertion that “the only proper nursery” of the “noble plants” of the arts and sciences is “a free state,” in “Of the Rise and Progress of the Arts and Sciences” (in *Essays Moral, Political and Literary* [Oxford: Oxford University Press, 1963], 125). In Wright’s address, the cultivation textile machines enable is thus explicitly implicated in a mechanic georgic vision of social progress.

¹²⁸ Mercator [Gladstone], 5.

¹²⁹ The power of mechanized production methods to increase and cultivate a population is narrated in Wright’s *An address* (1785): “Manchester in the beginning of this century was a small, mean, dirty village—now, it is a large, splendid, and clean town, containing near fifty thousand inhabitants—the country around was then naturally sterile, contemptible, and not worth at an average five shillings an acre—now it is covered with houses, and rents from two to seven pounds, and is worth at least three pounds ten shillings at a mean proportion—the people were ignorant, indolent, ill cloathed, poorly fed, and not better housed—at this day the commonality, and even their infants, are all bred to business, are active and industrious, and are better fed, cloathed, and housed than those of almost any other part of the world” (24-25).

¹³⁰ *Oxford English Dictionary Online*, s.v. “spinster, n.,” last modified December 2012, <http://www.oed.com/view/Entry/186771>.

after 1550 “‘spinster’ began to appear in court, probate, and administrative records” to refer to “a never-married woman without assuming a premarital status,” a term broadly “appropriate to both young and old women, as well as to women before they married or women who never married.” As Froide argues, in linking their occupation to their single status, the term “emphasized these women's economic independence.”¹³¹ Contrary to what we might assume, in this usage and at this time, “‘spinster’ was a neutral descriptor,” and was not assigned as a permanent identity category: it simply denoted a women’s current marital status. Froide points out that the designation “did not become a derogatory term until the eighteenth century.”¹³² She attributes this derogation to a number of cultural factors that combined to make eighteenth-century singlewomen the target of shame and ridicule, such as the pro-natalist movement described above, increasing anxieties about independent women’s economic power, and the continuing reverberations of the banishment of nunneries during the Reformation. These factors are certainly important, but equally so, I would argue, is the more literal context of the female textile labourer’s role in eighteenth-century Britain. With distaff in hand, the spinster initially embodied a lineage of female fecundity; as the century wore on, however, and various machineries superseded the distaff, spinsters came to be mocked as a clutch of “superannuated virgins” who, in their failure to adequately fulfill their social function, were seen as “hapless and pathetic” at best, and, at worst, “a menace to English

¹³¹ Given what we know about the poor pay spinsters received for their labours, “independence” may overstate the case—but nevertheless, Froide’s point that it highlights women’s economic productivity stands.

¹³² Amy M. Froide, *Never Married: Singlewomen in Early Modern England* (Oxford: Oxford University Press, 2005), 159.

society.”¹³³ These shifting meanings reflect how the spinster was rendered both productively and *reproductively* impotent absent the fostering power of new technologies. Her terrifyingly inadequate body, abjected to consolidate the mechanizing state, can, however, ultimately be seen to pattern not only British textile machineries, but the nation itself. As I will explore in this chapter’s final section, as technology took over the power of (re)producing the body politic, this body was haunted by its dependence on the “curious and complex machines” without which even its most ingenious citizens could be “reduced in a moment to the condition of savages.”

Civilization and its replicants

With *The Discarded Spinster* of 1791, Thomas Sadler composed a poem that acted, according to its title, as “a plea for the poor, on the impolicy of spinning jennies.”¹³⁴ Sadler writes, as he says in the preface, to “give language” to the distresses of female textile workers in the wake of mechanization (ii). He begins by painting an idyllic picture of the domestic spinster as a “happy mother” who, first teaching her children with “merry movements” to “[draw] the slender thread,” later “counts with the *skeins* the wages of their toil,” which will purchase them ribbons, caps, and shoes (4-5). His polemic links the spinster and her craft to “Maternal Nature,” whose “all inclusive plan / Design’d a competence to ev’ry man”; spinning jennies, in contrast, are the product of “step-dame Art,” who “with curst contracted view, / *Wrongs* a whole region to enrich a

¹³³ Froide, 164, 155.

¹³⁴ Thomas Sadler, *The discarded spinster; or, a plea for the poor, on the impolicy of spinning jennies* (London: R.V. Brooke, 1791), 1, ECCO (CW114472414). References are to page numbers in this edition.

Few” (8). These wrongs include the destruction of the labouring-class family as “the JENNIES take all work away” (20), leaving the spinster’s child, though “nurs’d in industry,” able to end only in the workhouse or upon the scaffold (21). Sadler emphasizes that he is not against the use of machinery, but believes that technologies should only serve to “improve th’imperfect labours of the hand / Or compass what leaves labour at a stand”: that “Art should Nature aid: / But ever, not as Mistress, but as Maid” (9). His contrast between spinster and jenny thus hinges on the difference between “Nature” and “Art,” and particularly upon these categories’ relationship to forms of reproduction: the spinster-mother, on nature’s side, brings forth thread and industrious children, while “Lawless, uncensur’d JENNIES” with “*Briarian* hands” effect a kind of grotesque parody of these labours, sowing destruction and “robb[ing] whole lands” (22). Sadler’s critique of mechanization implicitly invokes Aristotle’s description of the difference between the products of nature and those of *techne* (“art or technical skill”) in the *Nichomachean Ethics*. “[N]atural objects,” writes Aristotle, “have their origin in themselves,” while “art is concerned with bringing something into being...that is capable either of being or of not being, and the cause of which is in the producer and not in the product.”¹³⁵ The “Art” Sadler describes, no longer a chaste “Maid” but instead a “Mistress,” has muddled the boundaries between these categories, as product takes on the role of producer and thereby initiates unnatural forms of generation.

¹³⁵ Aristotle, *The Ethics of Aristotle*, trans. J.A.K. Thompson and Hugh Tredennick (London: Penguin, 1976), 208. Sawday explores the concept of *technē* and its importance to early modern ideas about technology in *Engines of the Imagination*, particularly 1-4.

Sadler's poem engages with many of the ideas I have been exploring in treatises such as Bentley's, but raises them to voice anxieties about how mechanization has confused the relationship between the human body and the mechanical agents that assume the body's artificial powers. Sadler's images of monstrous generation are echoed in other texts from the late eighteenth century that reflect, from varying positions, upon machinery's new consequence in the civic body.¹³⁶ Ralph Mather, in *An Impartial Representation of the Case of the Poor Cotton Spinners in Lancashire, &c.* (1780), writes from the perspective of one who "from a child, has been regularly brought up in all the branches of the Cotton business," and is disturbed by the effects of mechanization, particularly upon female textile workers.¹³⁷ Writing to support his proposal to redress these effects by heavily taxing the use of machinery in the manufacture, Mather decries "the rapid increase of the number of these machines" since 1774, and particularly the introduction of

Jennies for spinning with one hundred or two hundred spindles, or more, going all at once, and requiring but one person to manage them: (one of which spindles was the old and usual instrument by which every poor woman obtained her bread)...
(3)

¹³⁶ While I focus here on images of monstrous reproduction in the textile industry, these images of unnatural generation echo those Kibbie has analysed in the anti-usury tracts that attacked another of modernity's unchecked excrescences: the proliferation of money from money. These tracts call on the same Aristotelian paradigm of natural reproduction versus artificial sterility, asserting (as Phillipus Caesar did in 1578) that it was "the madnesse of men...that to a thyng fruitless, barren, without seede, without life, will ascribe generation: and contrary to common sense, with make that to engender, whiche beeyng without life no way can increase" (quoted in Kibbie, 1025). This echo demonstrates how textile machineries' appropriation of the human (and specifically the female) body's reproductive powers is linked to the manufacture's implication in larger capitalist systems of production and generation. See "Monstrous Generation: The Birth of Capital in Defoe's *Moll Flanders* and *Roxana*," *PMLA* 110, no. 5 (1995): 1023-1034, <http://www.jstor.org/stable/463027>.

¹³⁷ Ralph Mather, *An Impartial Representation of the Case of the Poor Cotton Spinners in Lancashire, &c., with a Mode Proposed to the Legislature for their Relief* (London, 1780), 7. References are to this edition.

The jenny's ever-multiplying hands are represented by Mather not as a triumph of ingenuity, but as an emblem of the kinds of unnatural increase and unchecked proliferation that characterize the mechanized manufacture. He continues, defending the violence of machine-breaking labourers by representing their desperation at

seeing at their very doors these Machines and Engines erected, the great cause of their calamitous situation, and the number of them daily multiplying, whereby all their future hopes of a subsistence, should trade again revive, were cut off, and not being able any longer to endure the wants of nature in themselves and families, which before the erection of these Machines and Engines were competently supplied... (4)

Mather's description of the machines' reign in Lancashire depicts their numbers mushrooming absent any intervention or control of human workers or, indeed, of the inventors that originally framed their action. Multiplying as the labouring poor watch in horror from the homes upon which they encroach, these engines appear to generate their own "rapid increase." In the grips of anxiety and want, Mather explains, "several thousands of these indigent sufferers" finally "pulled down and broke in pieces several hundreds of the Carding, Doubling, and Twisting Engines and large Jennies" and "set fire to and burnt down one of the large Patent Machines" (4). The labourers' violent acts of deconstruction only result in their own punishment, however, and Mather is left to reckon with the machinery's frightening rampancy of (re)production by appealing—unsuccessfully—to the powers of natural and civil law.

It is not only writers who explicitly oppose mechanized expansion who grapple with the rapid proliferation of textile machineries. The anonymous author of *An important crisis*, who writes glowingly about how machinery enables the labouring population to "multiply beyond the common ratio," explores the same anxious questions

from the safety of a hypothetical scenario. “Let it even be admitted,” he writes, “that it [the mechanized cotton manufacture] has advanced too rapidly, and that it has extended too far”: this is, he contends, “only an additional argument for its protection,” since “[t]he powers of machinery are created,” and it would “be a species of political murder to allow these powers to perish” (22). As the author’s equivocal response suggests, intervention in the mechanized industry’s unchecked growth is impossible, both because of the unstable, multiply-generative powers “created” in mechanical objects, and because of the ways in which this mechanized force is now completely inextricable from the state’s own power, making their extinction—or “murder”—mutual. This anonymous writer was not the only advocate of mechanization to express ambivalence about the nature of Britain’s mechanical powers. Dorning Rasbotham, in the midst of his treatise’s seemingly total support of the British cotton industry’s mechanized expansion (quoted extensively above), pauses to entertain a hypothetical scenario:

Let us for a moment *suppose*, that *machines* in general were *hurtful* to trade, and to the poor, and, that it were much to be *wished*, they had never been *invented*. Yet we ought to consider, *is it possible to put them down?* Because, if it were *not possible*, it would be our wisdom, not to *attempt* it, but to draw as much *good* from them *as we can*. If they were *evils*, yet they are now *necessary evils*. If they had been *better*, they had *never been invented*; yet, as they are *invented*, the question is, what shall we *do with them?* Shall we *refuse* them ourselves, and send them to *other* nations? That would plainly be our *absolute ruin*. (17-18)

Rasbotham’s aside exposes, through layers of speculative rhetoric and conditional grammar, how his argument for the continued expansion of mechanization is grounded in dependence and fear. Like the author of *An Important Crisis*, Rasbotham acknowledges the fragility of the nation’s control over the machinery that defines it, attributing to machines a self-acting force to which Britain must capitulate, or face “*absolute ruin*.” As

he continues, he makes more explicit how this dependence is premised on technology's appropriation of the labouring body's productive powers: "Whilst a manufacture lies chiefly in the *ingenuity and dexterity* of the hands employed, and this dexterity depends upon *education and early habit*," he writes, "you cannot take *it* away, without taking away the *people*. But *machines* belong to no *place* or country. They are *commoners of nature*. They will work as well in *France*, or *Spain*, as in *England*" (18). With this observation, Rasbotham mirrors Sadler's assertion in *The Discarded Spinster*'s preface that a future Britain will be confronted with the dire economic and political consequences of

discouraging the industrious spirit of our Poor, by taking our Manufactures out of their hands: and not only so, but the adapting substitutes for the performance of them of a nature so mutable as to promise no lasting attachment to any particular soil. (iii-iv)

Both pro- and anti-expansionist advocate are united in this observation that the supposedly inherent Britishness of mechanical ingenuity is nothing but a useful fiction, belied by the easy transnational movement of its innovations. While Sadler employs it to intercede on behalf of the spinster, and urge that the poor "may be still entitled to a comfortable share of that plenty which their labours, hitherto, have procured the general community" (v), Rasbotham is more conflicted. Entertaining these anxieties only in the form of conjecture and finally dismissing them as "idle fancy," he nonetheless urges that such "uncomfortable reflection[s]" should instruct Britons to "protect and encourage" the use and development of machines, and give them "every reason to *go on*, and add to their improvements," against the potent, though barely admitted, possibilities of ingenuity's failures (18).

Two other, intertwined threats haunt the pages of texts considering mechanization, indicating at once machinery's central role in late eighteenth-century Britain and the apprehensions that attended its position. Rather than evoking machinery's (re)productive capacity through representations of unnatural or monstrous generation, these threats manifest through images of *degeneration*. We can see this, for instance, in a passage from the anonymous 1788 pamphlet *Observations on the means of extending the consumption of British muslins*, which reflects on the “astonishing” and “almost incredible” progress of the mechanized industry over the last decade, asserting that

[t]his important fact suggest[s]...the absolute necessity of finding new channels of consumption, and of devising means by which a more extended sale could be promoted, so as to keep alive those powers of machinery which have been so beneficially disseminated all over the country; and to continue in employment the numerous bodies of men, women, and children, who are trained and training to this business.¹³⁸

In this formulation, rather than machinery working to extend Britain's international trade and to bolster its economy, extending trade is an “absolute necessity” in order to ensure that Britain's machinery remains functional. The difference is subtle, but significant: the country's mechanical powers, the author suggests, are what must be served by political and economic decisions, because of the way these powers currently structure the nation's productive abilities. While the pamphlet carefully avoids imagining what might occur following the loss of such powers, the threat of their dissolution structures its argument.

¹³⁸ *Observations on the means of extending the Consumption of British Callicoes, Muslins, and other Cotton Goods, and of giving pecuniary Aids to the Manufacturers, under circumstances of the highest Respectability and Advantage* (London, 1788), 2, ECCO (CW105240231). The direct threat the pamphlet is addressing is competition from the East India Company's import of Indian fabrics, which sparked increasing protests from those involved in the British cotton manufacture through the late 1780s and early 1790s.

The “numerous bodies” made efficacious through their contact with technological systems, this argument implies, could fall into dereliction just as easily as the machines that activate them. A version of this fear recurs in *A Representation of Facts Relative to the Rise and Progress of the Cotton Manufacture in Great Britain* (1789), which contends that if the cotton industry does not continue to thrive, “[o]ur unoccupied mills will become rubbish, and many of our workmen will be invited to the Continent, where a rivalry may be raised against this Country, perhaps a century earlier than could have happened in the natural course of events.”¹³⁹ Unlike the previous text’s author, this writer baldly states the imagined consequences of mechanization’s failure, a terrifying vision of industrial detritus and expatriated citizens (and, consequently, a broken nation). The easy slippage this projection illustrates from productive technologies to defunct trash indicates the felt tenuousness of the cultural superiority supposedly achieved through the invention and use of mechanical innovations. The same imagery surfaces in *An Important Crisis* (1788). Arguing against the importation of Indian cotton fabrics by the East India Company, the author promises that

on a supposition that only one half of the mills and machinery now in use were to be suddenly thrown idle, it would not merely be the loss of *half a million* of money sunk in this machinery, which must become rubbish, and sell for nothing;

¹³⁹ *A representation of facts relative to the rise and progress of the cotton manufacture in Great Britain. With observations on the means of extending and improving this valuable branch of trade, For the Benefit of Individuals concerned, and the Nation at large* (London, 1789), 20, ECCO (CW3306712034). The continual return in these writings to the specter of machines and workers being appropriated by continental (implicitly French) powers addresses a real threat. As J.R. Harris has detailed, across the last third of the eighteenth century “English mechanical inventions in textiles... attracted an unprecedentedly strong interest among French businessmen, manufacturers, and administrators” (361), leading to an active program of industrial espionage and the grooming of British defectors. After the design of the spinning jenny was successfully appropriated by French manufacturers in 1771, Britain introduced an increasingly stringent set of legal restrictions regarding the exportation of textile machineries and the emigration of textile workers (361). See Harris, *Industrial Espionage and Technology Transfer: Britain and France in the Eighteenth Century* (Brookfield: Ashgate, 1998), especially chapters 15 and 16.

but in the derangement of a great and useful system; in the loss of the extensive powers derived from the combination of human and artificial labour, perhaps equal to the common exertions of half a million of people... (20-21)

This writer similarly emphasizes the uncomfortably fine distinction between useful machinery and unproductive, valueless “rubbish.” And, like the sometime “extensive powers” of this technology, the “great and useful system” of labour, capital, and national glory it supplies is represented as flimsy and contingent, subject to derangements of its ingenuity.

In addition to representing fears about the potential failure of machines to sustain their generative function, writers reflecting on the cotton industry grappled with how the labouring population engaged with—and resisted—these technological systems. The machine-breaking mob surfaces repeatedly as an object of mingled disdain and dread. Organized resistance by workers to mechanization surfaced repeatedly across the late eighteenth century; this resistance sometimes (though not always) included the destruction of machines themselves. Notably, many of the labourers who actively protested against mechanization were women.¹⁴⁰ In the face of this sometimes-violent worker protest, writers who supported mechanized expansion were forced to confront labourers’ rejection of the ingenious system of which they were a subordinate but essential component; most often, they did so by arguing that these protesters embodied the disorder they deliberately introduced into the manufacture. Bentley, whose treatise on the utility of mechanized production methods is written in direct response to “the late

¹⁴⁰ For an account of the gender dynamics of worker protests see Paul A. Custer, “Refiguring Jemima: Gender, Work and Politics in Lancashire 1770-1820,” *Past & Present* 195 (2007): 127-58, <http://www.jstor.org/stable/25096671>.

disturbances in Lancashire,” attributes the destruction of “ingenious *machines*” for “*carding, roving, and spinning cotton*” in these disturbances to “a fit of madness” gripping the labouring population (1, 10). Characterizing the agitators as a group acting in a “blind rage” (1) and in error stemming from their “ignorance and gross immorality” (2), he repudiates the “vulgar prejudices” (2) of this “deluded people” (7) and hopes, through his writings, to convince them of their mistake. James Ogden, in *A Description of Manchester* (1783), likewise describes protesters as “deluded country people” who destroy machinery without reflection or legitimate motive, spurred only by the bluster of one “making his complaint to others when they were intoxicated at the alehouse.”¹⁴¹ Rasbotham’s treatise, addressed “To the Working People” in the cotton industry as their “*Friend*” (3), is less overtly contemptuous, but still represents willful labourers as a “mob” animated by a “general spirit of phrenzy and folly” (10, 20).¹⁴² Descriptions like these, which recur across a wide variety of texts reflecting on the cotton industry, categorized labourers who agitated against (and dismantled) machine technologies as figures of brutish unreason, deficient in understanding and civility. In the contexts I have been exploring throughout this chapter, these representations carried a specific kind of force. Machine-breakers, who reject the technologies of the modern state, are denied the capacities these technologies both symbolize and supposedly enable: reason, culture, civilized humanity. In this way, protesting labourers are linked with the supposedly pre-

¹⁴¹ James Ogden, *A description of Manchester: giving an historical account of those limits in which the town was formerly included...By a native of the town* (Manchester: C. Wheeler et al, 1783), 88, ECCO (CW3303313130).

¹⁴² For writers addressing the problem of protesting workers in the late 1780s and the 1790s, the context of the French Revolution would make the violent, chaotic mob they represented a particularly threatening force.

technological populations against which the mechanized British state measured itself, such as the Indian textile workers I discussed above. In fact, it is their concern over unruly, anti-technological labourers in Britain that stimulates Bentley's and Rasbotham's wider reflections on the relationship between mechanization and civilization. While these authors' collective repudiation of machine-breakers as irrational and benighted works to uphold the equivalence increasingly drawn between technology and Britain's cultural superiority, it also ultimately destabilizes it. Their accounts of textile workers not only point to the presence of a persistently "uncivilizable" population in Britain, but also find this population among those workers who have the most intimate contact with the technologies purported to elevate the nation and its citizenry. Refusing these technologies' ingenious systems, protesting labourers instead formed "large bodies" that worked to "burn and demolish...those monopolizing erections, the sad causes of their distress."¹⁴³ Acting as "an orderly parody of order, a monstrous body without parts," this kind of anarchic "assemblage"¹⁴⁴ violently asserted an alternative to the vision of mechanized manufacture articulated by Adam Ferguson three years after the jenny's invention: an industry in which "the workshop may, without any great effort of the imagination, be considered as an engine, the parts of which are men."¹⁴⁵ As I have argued, the parts of the textile manufacture's industrial engine were *women*, whose

¹⁴³ Mather, 4

¹⁴⁴ Custer, 131-132.

¹⁴⁵ Ferguson's description is linked to his dystopian view of a mechanized near-future in which he fears that "thinking itself... may become a peculiar craft." See *An Essay on the History of Civil Society*, ed. Oz-Salzberger (New York: Cambridge University Press, 1995), 174-75. For a discussion of how Ferguson's perspective is implicated in "important shifts in the relationship between the mechanical and the virtuous" (39) in the late eighteenth century, see Wetmore.

embodied labour was both appropriated by the manufacture's machinery and required to run it. Participating in the protests that fractured this engine, women disassembled the system that had shifted the terms of what it meant to manufacture: a denotation that drifted away, in the late eighteenth century, from the etymologically grounded (and now obsolete) signification "to produce or work upon any sort of things by the hands"¹⁴⁶ towards the still-current meaning, "To make (a product, goods, etc.) from...raw material, to produce (goods) by physical labour, machinery, etc....especially on a large scale."¹⁴⁷ While spinster's hands may no longer have been granted the capacity to produce goods, they could still destroy the textile industry's mechanical parts.

Though worker protests could locally and temporarily halt the progress of mechanized industry, and though wider anxieties about mechanization persisted, the machine tenaciously retained its place in the national imagination. As mechanical technologies structured Britain's economy and trade, they reciprocally structured the capacities of the British citizen's body and mind. Writing on the cusp of the moment in which the cotton manufacture burst forth, Adam Smith offers one account of this structuring principle. "Systems in so many respects resemble machines," he writes:

A machine is a little system, created to perform, as well as to connect together, in reality, those different movements and effects which the artist has occasion for. A system is an imaginary machine invented to connect together in the fancy those different movements and effects which are already in reality performed.¹⁴⁸

¹⁴⁶ Francis Allen, *A complete English dictionary: containing an explanation of all the words made use of in the common occurrences of life, or in the several arts and sciences* (London: J. Wilson and J. Fell, 1765), ECCO (CW3313509641), s.v. "to manufacture." Allen likewise defines the noun "manufacture" as "any sort of work made by the hand."

¹⁴⁷ *Oxford English Dictionary Online*, s.v. "manufacture, v," last updated December 2014, <http://www.oed.com/view/Entry/113770>.

¹⁴⁸ Adam Smith, *Essays on Philosophical Subjects*, ed. W.P.D. Wightman, J.C. Bryce, and Ian Simpson Ross (Oxford: Clarendon Press, 1980), 66.

Ingenious British citizens, whom Smith elsewhere names “philosophers” or “men of speculation,” are able both to fashion “improvements in machinery,” and to use their capacities to observe, understand, and newly unite “the powers of the most distant and dissimilar objects.”¹⁴⁹ The invention of little systems like the jenny and the water-frame was mirrored by the creation of larger ones in which the movements and effects of bodies, materials, and technological objects were radically recombined—a process both powered and epistemologically enabled by mechanism. Newly uniting Britain’s cultural authority with its technological facility, men of speculation claimed a fanciful control over the “machine of trade”¹⁵⁰ that they worked to buttress with aggressive and interlinked economic, ideological, and imperial projects. And in the midst of all this, “The apprehensions of some persons run *high indeed*,” says Rasbotham: “They seem almost to expect, that the whole cotton manufacture will be performed by machines, and ask, what *then* will becomes of our *Poor*?” The question Rasbotham poses himself ultimately asks: to what ends does the system of mechanization move? And: what are its implications for the subjects whose capacities it is supposed to extend? “In answer to this, it may be said,” writes Rasbotham,

That perhaps no person, even the wisest among us, can exactly foretell *all the effects*, the machines may produce.... Trade is of so *large* and *complicated* a nature, there is so near *connection* between different Trades, one discovery leads on to so many *more*, one *cause* produces so many *unthought of effects*, that, very possibly, consequences, which no man could ever have *imagined*, will follow.¹⁵¹

¹⁴⁹ Smith, *Wealth of Nations*, 17-18.

¹⁵⁰ John Dyer, *The Fleece. A Poem. In Four Books* (London: R. and J. Dodsley, 1757), 135, ECCO (CB127670775).

¹⁵¹ Rasbotham, 11.

Rasbotham's answer articulates the fundamental inability of ingenuity to exercise control over the systems it has set into motion, and the failure of speculation to apprehend these systems' far-reaching effects. From our perspective, though, we can see that the products of mechanization were not simply cotton thread, ballooning profits, a new nationalism, or even the factory systems that would organize industrial capitalism through the nineteenth century. More fundamentally, the material and discursive project of mechanization shaped British subjectivity and embodiment, producing the ingenious man who built the system, and the necessary woman who must either move within it, or embody its derangement.

CONCLUSION

I wish to conclude this dissertation's analysis of the eighteenth century's mechanics of gender difference by discussing the Victorian mathematician Charles Babbage's technological works. While Babbage is famous for inventing calculating machines, these devices were never actually built, except fragmentarily: instead, his work existed mainly as a textual construct delineated in proposals for its construction, technical drawings, and Babbage's new system of "mechanical notation," a language designed to show "at a glance what every moving piece of machinery was doing at each instant of time."¹ I see in the written remains of Babbage's works (both remembered and forgotten) the contours of much of what I have traced in the preceding chapters of this project: the intensifying need to supplement bodily capacities with technological objects (and to discipline the body into a mechanized conformity); the definition of an ingenious technological masculinity against a femininity marked as trivial, superficial, or ornamental; the eroticized apprehension of a feminine, mechanical interiority; and the consolidation of British nationalism through the mechanical appropriation of women's labour. Babbage's work allows me to revisit this project's key arguments, and, further, to look forward from them, exploring how the mutual definition of technology and gendered selfhood in the long eighteenth century structures both Babbage's nineteenth-century inventions, and the contemporary conditions of technological modernity frequently claimed to have originated in them.²

¹ Schaffer, "Babbage's Intelligence: Calculating Engines and the Factory System," *Critical Inquiry* 21, no. 1 (1994): 207, <http://www.jstor.org/stable/1343892>.

² I thank Lisa Kabesh for her help in developing these concluding remarks.

From the 1820s onward, Babbage sought to realize the invention of the Difference Engine,³ a “machine, which, by the aid of gravity or any other moving power, should become a substitute for one of the lowest operations of the human intellect.”⁴ Mathematical tables, which had previously been compiled through “the dull and tedious repetition of many thousand additions and subtractions, or other adequate numerical operations,”⁵ would now be mechanically produced. While, as I have shown, technologies were increasingly called on to supplement the body (and thus to redefine embodied subjectivity) across the long eighteenth century, the Difference Engine went further, seeking to extend the intellect itself by materializing certain of its functions in a machine. As Henry Thomas Colebrooke explained when presenting Babbage and his engine with the Astronomical Society’s gold medal in 1825,

In other cases, mechanical devices have substituted machines for simpler tools or for bodily labour. The artist has been furnished with commands of power beyond human strength, joined with a precision surpassing any ordinary attainment of dexterity....But the invention, to which I am adverting, comes in place of mental exertion: it substitutes mechanical performance for an intellectual process: and that performance is effected with celerity and exactness unattainable in ordinary methods, even by incessant practice and undiverted attention.⁶

³ The machine’s name was so capitalized by Babbage and contemporary critics have uniformly replicated this rendering, a convention I follow here. The continued capitalization is an interesting stylistic choice, one reflecting, perhaps, a desire to textually mark a monumentality seen to characterize the invention.

⁴ Charles Babbage, “A Letter to Sir Humphry Davy, President of the Royal Society, on the Application of Machinery to the Purpose of Calculating and Printing Mathematical Tables,” in *The Works of Charles Babbage*, ed. Martin Campbell-Kelly, vol. 2, *The Difference Engine and Table Making* (1822; London: William Pickering, 1989), 6.

⁵ Francis Baily, “On Mr Babbage’s New Machine for Calculating and Printing Mathematical and Astronomical Tables,” in *The Works of Charles Babbage*, ed. Martin Campbell-Kelly, vol. 2, *The Difference Engine and Table Making* (1823; London: William Pickering, 1989), 44.

⁶ Colebrooke, “Address on Presenting the Gold Medal of the Astronomical Society to Charles Babbage,” in *The Works of Charles Babbage*, ed. Martin Campbell-Kelly, vol. 2, *The Difference Engine and Table Making* (1825; London: William Pickering, 1989), 57.

The Engine, which (along with his other mechanical inventions) Babbage called “the absolute creations of my own mind,” instrumentalized that mind’s functions, so fulfilling Babbage’s original desire, when sitting “in a kind of dreary mood” with “a table of logarithms laying open before [him],” that “all of these tables...might be calculated by machinery.”⁷ By performing such mathematical calculations, machines could, as Babbage wrote, “become active agents in reducing the abstract enquiries of geometry to a form and an arrangement adapted to the ordinary purposes of human society.”⁸

The Difference Engine took on not just the intellectual functions Colebrooke detailed, however, but bodily ones as well: in addition to mechanizing a mental labour he designated tedious, one of Babbage’s main objectives in constructing the machine was to eliminate the errors introduced into printed mathematical tables by writers and compositors. If his machine only calculated numbers, Babbage wrote, “The errors of the persons employed to copy the figures presented by the engines” would “interfere with their correctness.” “To remedy this evil,” he explains,

I have contrived means by which the machines themselves shall take from several boxes containing type, the numbers which they calculate, and place them side by side; thus becoming at the same time a substitute for the compositor and the computer: by which means all error in copying as well as printing is removed.⁹

As a technology of textual production, the Difference Engine augments the print machinery that, as I explored in chapter 3, made press-men (and the texts they

⁷ Babbage, *Passages from the Life of a Philosopher* (London: Longman, Roberts, and Green, 1864), 42. In another version of the story, Babbage frustratedly exclaims, “I wish to God these calculations had been executed by steam!” See H.W. Buxton, *Memoir of the Life and Labours of the Late Charles Babbage Esq., F.R.S.*, ed. Anthony Hyman (1880; Cambridge: MIT Press, 1988), 46.

⁸ Babbage, “Letter to Sir Humphry Davy,” 13.

⁹ Babbage, “Letter to Sir Humphry Davy,” 7.

manufactured) functional parts in a mechanized industrial system. Whereas these pressmen were required to regulate their bodies in order to efficiently mass-produce identical texts, Babbage's Engine substitutes machine parts for labourers, thus totally eliminating the variations in production now marked only as error. Like the asterisks in Fanny's valediction or the water-frame's action, the Difference Engine erases the work of hands to establish a mechanized conformity. The machine's replacement of the "computer" along with the "compositor" represents a similar intensification of the mechanics of industrial production. Babbage's project was inspired by more than a personal frustration with logarithmic calculations: it was grounded in the work of French engineer and mathematician Gaspard Riche de Prony, who in the 1790s had produced a series of unprecedentedly comprehensive logarithmic tables by applying Smith's principle of the division of labour to their computation, or, as Prony put it, by "manufactur[ing] my logarithms as one manufactures pins."¹⁰ Prony's method entailed dividing the work of logarithmic calculations into three "sections": in the first, accomplished mathematicians (including Prony himself) selected formulae, in the second, "skilful calculators" converted the formulae into numbers, and, in the third, "sixty to eighty persons, few of them possessing a knowledge of more than the first rules of arithmetic," added and subtracted the given numbers, so completing the tables.¹¹ Babbage's invention replaced the third section of calculators with his Engine, so, he

¹⁰ Quoted in Lorraine Daston, "Enlightenment Calculations," *Critical Inquiry* 21, no. 1 (1994): 193, <http://www.jstor.org/stable/1343891>.

¹¹ Babbage, "Letter to Sir Humphry Davy," 11-12. As Daston shows in "Enlightenment Calculations," Prony's project was instrumental in shifting perceptions of calculation: once an integral part of intellectual life, it became a tedious and mechanical labour (186-190).

argued, speeding up the process of computation, eliminating human error, reducing the number of workers required to produce mathematical tables,¹² and, like other industrial machineries, providing a “check” against “the inattention, idleness,” and “dishonesty of human agents.”¹³ Substituting technological systems for workers, Babbage would eliminate the problem of bodies that perversely refused to be disciplined into mechanism.

While Babbage, by “put[ting] an engine in the place of a computer,”¹⁴ attempted to establish a “manufactory of figures”¹⁵ free of unruliness and fallibility, his project exceeded a merely industrial logic. The mathematical, astronomical, and nautical tables the Engine’s faultless operations would produce were part of what Babbage called a “statesmanlike” project, since, he asserted, it is “of the highest importance to a country, possessing an extensive marine” to have astronomical and nautical knowledge of an “unerring precision.”¹⁶ As D. Lardner wrote when defending the Engine in 1834, it “cannot be said that there is any table whatever, necessary to the astronomer, which is unnecessary to for the navigator,” and that thus the “more numerous, minute, and accurate these predictions can be made, the greater will be the facilities which can be furnished to the mariner” to “determine by *Nautical Astronomy* the position of a ship at sea,” and, perhaps more importantly, “to determine the precise position of various

¹² Babbage, “Letter to Sir Humphry Davy,” 9, 7, 12.

¹³ Babbage, *On the Economy of Machinery and Manufactures*, 4th ed. (London, 1835), 54.

¹⁴ Colebrooke, 58.

¹⁵ L.F. Menabrea, “Sketch of the Analytical Engine,” trans. Ada Lovelace, in *The Works of Charles Babbage*, ed. Martin Campbell-Kelly, vol. 3, *The Analytical Engine and Mechanical Notation* (1843; London: William Pickering, 1989), 113.

¹⁶ Babbage, “Statement addressed to the Duke of Wellington respecting the calculating engine,” in *The Works of Charles Babbage*, ed. Martin Campbell-Kelly, vol. 3, *The Analytical Engine and Mechanical Notation* (1834; London: William Pickering, 1989), 2.

interesting and important points on the surface of the earth.”¹⁷ In recognition of its national importance, the Engine’s development and construction was supported by the British government, who poured an estimated £20,000 into the project.¹⁸ As Babbage and Lardner’s reflections show, mathematical tables were themselves a technology of imperial modernity, one that allowed the British citizen to accurately perceive the world over which such ingenuities afforded him sovereignty; in this way, tables resembled the system of mechanical notation Babbage invented to facilitate the design and production of his engines, a system that “reduc[ed] a vast network of relationships intricately and substantially extended in space and time to the confines of one, or a few, pieces of paper.”¹⁹ By “throw[ing] the powers of thought into wheel-work”²⁰ and so processing empirical information mechanically, Babbage’s Engine made perception an abstract technological process.²¹ In addition to enhancing systems of mechanical textual production, then, the Difference Engine augmented perceptual technologies like the telescope and microscope I discussed in chapter 1, by affording its virtuoso a flawlessly calculated account of the world laid before him on the page.

¹⁷ D. Lardner, “Babbage’s Calculating Engine,” in *The Works of Charles Babbage*, ed. Martin Campbell-Kelly, vol. 2, *The Difference Engine and Table Making* (1834; London: William Pickering, 1989), 125-126.

¹⁸ Babbage, “To the Duke of Wellington,” 4.

¹⁹ Gordon L. Miller, “Charles Babbage and the Design of Intelligence: Computers and Society in 19th-Century England,” *Bulletin of Science, Technology & Society* 10, no. 2 (1990), 74, doi: 10.1177/027046769001000203.

²⁰ Lardner, “Babbage’s Calculating Engine,” 119.

²¹ The connection between mathematical computation and empirical knowledge is elaborated in Ada Lovelace’s writings on Babbage’s work, in which she contends that “this science constitutes the language through which alone we can adequately express the great facts of the natural world, and those unceasing changes of mutual relationship which, visibly or invisibly, consciously or unconsciously to our immediate physical perceptions, are interminably going on in the agencies of the creation we live amidst”; therefore “mathematical truth” is “the instrument through which the weak mind can most effectively read his Creator’s works.” See Lovelace’s “Notes by the Translator” appended to L.F. Menabrea’s “Sketch of the Analytical Engine” in *The Works of Charles Babbage*, ed. Martin Campbell-Kelly, vol. 3, *The Analytical Engine and Mechanical Notation* (1843; London: William Pickering, 1989), 121.

While Babbage's Engine demonstrates the persistence of a number of the ideas I have analysed in this dissertation, his work's implication in the continuing legacy of eighteenth-century constructions of gender difference is made clearer by the forgotten device he cited as the original object of his mechanical vision. In his memoirs, Babbage recalls his revelatory first encounter with automated objects at the "exhibitions of machinery" he and his mother visited when he was a child. "I well remember one of them in Hanover Square," he recalls, run by "a man who called himself Merlin": the young Babbage was so visibly fascinated with Merlin's collection of mechanical contrivances that the inventor "proposed to my mother to take me up to his workshop, where I should see more wonderful automata."²² Ascending to the attic, Babbage was entranced to see "two uncovered female figures of silver, about twelve inches high":

One of these walked or rather glided along a space of about four feet, when she turned round and went back to her original place. She used an eye-glass occasionally, and bowed frequently, as if recognizing her acquaintances. The motions of her limbs were singularly graceful. The other silver figure was an admirable *danseuse*, with a bird on the fore finger of her right hand, which wagged its tail, flapped its wings, and opened its beak. This lady attitudinized in a most fascinating manner. Her eyes were full of imagination, and irresistible. These silver figures were the chef-d'oeuvres of the artist: they had cost him years of unwearied labour, and were not even then finished. (17-18)

²² Babbage, *Passages from the Life of a Philosopher* (London: Longman, Roberts, and Green, 1864), 17. References are to this edition. In fact, John Joseph Merlin was the inventor's given name. He immigrated from The Netherlands to London in the 1760s, becoming "the first or principal mechanic" at Cox's Museum before leaving to independently produce mathematical and musical instruments, clocks, the first pair of roller skates, and a panoply of automata. See *Oxford Dictionary of National Biography*, s.v. "John Joseph Merlin (1735–1803)," by Charles Mould, last modified May 2013, doi: 10.1093/ref:odnb/46472. While employed at Cox's in the 1770s, Merlin constructed the famous "Silver Swan" automaton, which is still extant and functional, and is currently held at the Bowes museum: see <http://thebowesmuseum.org.uk/en-gb/collections/explorethecollection/thesilverswan.aspx>.

Gazing into the figure's irresistible eyes and taking in her fascinating attitudes, Babbage conceived what he called a "passion" for the mechanical *danseuse*, a passion that, though "boyish," was not confined to boyhood (426): 30 years later he would be reunited with the automaton that sparked his interest in mechanism when he purchased the *danseuse* from a third party after her maker's death (365). He immediately "proceeded to take to pieces the whole of the mechanism," and

found a multitude of small holes which had been stopped up as not having fulfilled their intended object. In fact, it appeared tolerably certain that scarcely any drawings could have been prepared for the automaton, but that the beautiful result arose from a system of continual trials. I myself repaired and restored all the mechanism of the Silver Lady, by which title she was afterwards known to my friends. I placed her under a glass case on a pedestal in my drawing-room, where she received, in her own silent but graceful manner, those valued friends who so frequently honoured me with their society on certain Saturday evenings. This piece of mechanism formed a striking contrast with the unfinished portion of the Difference Engine, No. 1, which was placed in the adjacent room: the whole of the latter existed in drawings upon paper before any portion of it was put together. (365)

Babbage's Silver Lady—a designation he frequently capitalizes like the name of the Difference Engine alongside which she is displayed—is yet another version of the kind of feminized machinery (and mechanized femininity) I have explored throughout this dissertation; indeed, constructed by the erstwhile principal mechanic at Cox's Museum and first encountered by Babbage around 1800, the Lady is, in some senses, a relic of the century then ending. Babbage's passionate and sustained response to the automaton, however, shows the continuing force of such constructions (and the discursive and ideological structures that animated them) into the nineteenth century.

The Lady, with her alluring nude exterior cast in silver and disguising an unexpected mechanism, exemplifies the kind of superficial “gloss’d outside Fallacies”²³ associated with both women’s embodiment and technologies of spectacular display since the Restoration. As he continues his description of the Lady, Babbage obsessively dwells on this surface, devoting pages of his memoir to the project of further ornamenting her body by “supply[ing] her with robes suitable to her station” (and covering her nakedness for public display) (366). This was accomplished “by the aid of one or two of my fair friends,” who “assisted with their own peculiar skill and taste at the *toilette* of their rival Syren”—“Sketches were made and modists of the purest water were employed,” he documents (366). Before one of the Lady’s regular appearances at Babbage’s Saturday salons, however, a new dress did not arrive, and so:

it occurred to me that there were a few remnants of beautiful Chinese crape in the silver lady’s wardrobe. Having selected two strips, one of pink and the other of light green, I hastily wound a platted band of bright auburn hair round the block on which her head-dresses were usually constructed, and then pinned the folds of coloured crape....Another larger piece of the same pink Chinese crape I wound round her person, which I thought showed it off to considerable advantage. Fortunately, I found in her wardrobe a pair of small pink satin slippers, on each of which I fixed a single silver spangle: then placing a small silver crescent in the front of her turban, I felt I had accomplished all that time and circumstances permitted. (366)

The automaton’s dishabille later affords Babbage the opportunity for a spicy joke, when he responds to his friend Lady Morgan’s whispered jibe, “My Dear Mr. Babbage, I think your Silver Lady is rather slightly clad to-night; shall I lend her a petticoat?” with a suggestive “My dear Lady Morgan, I am much indebted for your very considerate offer,

²³ Power, 18.

but I fear you have not got *one* to spare” (366). Sprucing his toy with luxurious adornments that only emphasize the erotic qualities of the gleaming silver nudity they cover, Babbage shows his passion to be libidinally as well as intellectually excited by the Lady’s mechanical attitudes. This investment in her beautiful surface is matched by his interest in scrutinizing the springs and wheels that animate her by “tak[ing] to pieces the whole of the mechanism” that lies behind that opaque facade: an analytical project that, as I demonstrated in my discussion of Richardson’s *Clarissa*, had long been characterized by the same kind of mingled sexual and scholarly drive. Whereas Lovelace’s charming broken clock frustrates his desires by stopping, Babbage repairs his favourite Lady, displaying her perfect performance of a silent, automated femininity in his drawing room. After “the romance of [his] boyish passion, the unexpected success of her acquisition, and the devoted cultivation [he] bestowed on her education,” Babbage is finally able to “set in action her fascinating and most graceful movements” (426).²⁴ His narration of the Lady’s story simultaneously positions her as the object of his desire and an invention of his creation, a dual identification pivoting on a gaze that takes in her silver skin and finally reaches past it to apprehend her interior, restoring and reauthoring it for his pleasure.

Babbage’s comparison of the Silver Lady and the Difference Engine is a juxtaposition that emphasizes the “striking contrast” between the two mechanical devices. The contrast he highlights is the manner of their design: while the Engine “existed in drawings upon paper before any portion of it was put together,” his autopsy of the Lady suggests that she was the unfinished product of “a system of continual trials” (365). This

²⁴ The *danseuse*’s performance here calls to mind that of her fictional contemporary, Hoffmann’s Olympia.

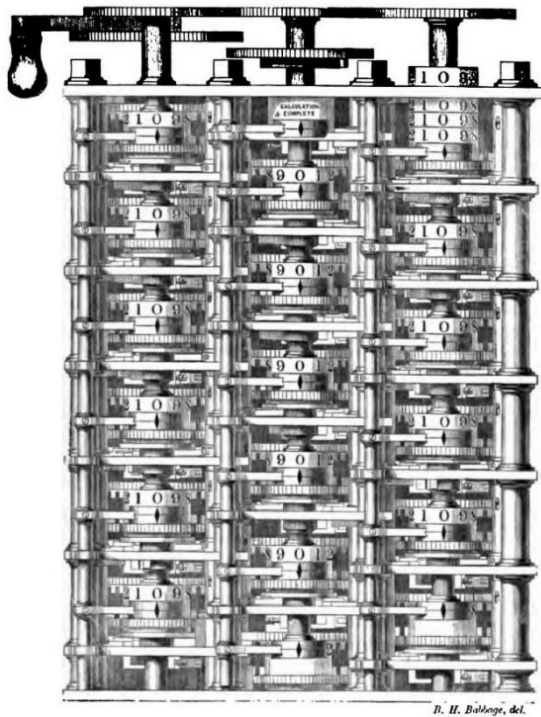


Figure 13 (left): Engraving of part the Difference Engine, from the frontispiece of Babbage's *Passages from the Life of a Philosopher* (1864).

Figure 14 (right): The same fragment of the Engine, currently held by the Science Museum in London.

distinction privileges Babbage's method of mechanical notation—his textual, technological vision—over the modes of mechanical experiment that have preceded it. Though he does not elaborate them, other contrasts strike the viewer (and reader): of the differences between an eroticized ornamental object and an ingenious mathematical engine; between a trivial toy and an instrument of scientific inquiry; between an enclosed silver exterior and an exposed mechanism (see figs. 13 and 14); between an identification with the bodily and with the intellectual, the feminine and the masculine. While these contrasts appear to divide the Lady and the Engine, their intimate relationship—both conceptual, as Babbage's original mechanical fascination and its ultimate result, and

physical, as two objects displayed in relation to each other—marks them as products of the same system. It is the system that builds the distinction between ingenuity and its object: between a female body made technological and thus able to be dominated, and a male body supplemented by technological objects and so able to dominate. As my dissertation has shown, this is the system through which, in the eighteenth century, new forms of gendered embodiment and subjectivity, and the new mechanisms that defined them, were mutually constructed: the system that thus produced both difference, and its engine.

As disparate artifacts of this system, the Silver Lady and the Difference Engine both finally became twin knacks to be admired at Babbage's parties: the fragment of the Engine he displayed in his home was the only part of it he ever successfully constructed, as financial difficulties, waning governmental interest, and "some dissatisfaction with the workmen"²⁵ stymied his efforts to realize its creation.²⁶ Besides, by the 1830s, Babbage was distracted by his plans for a still greater machine, the one for which he is now most famed. Babbage's Analytical Engine built on the premise of the Difference Engine, proposing, as its name suggests, "the construction of a machine, capable of executing not merely arithmetical calculations, but even those of analysis."²⁷ Ada Lovelace, Babbage's

²⁵ "Addition to the Memoir of M. Menabrea on the Analytical Engine," in *The Works of Charles Babbage*, ed. Martin Campbell-Kelly, vol. 3, *The Analytical Engine and Mechanical Notation* (1843; London: William Pickering, 1989), 83.

²⁶ The fragment of the engine was functional: Babbage would impress his guests by having it produce "a series of integers from unity to one million," setting the machine so that "at a certain point the machine would advance in steps of ten thousand"; an "indefinite number" of such shifts could be programmed into the machine, each one received as a "miracle" by onlookers (one of whom was Charles Darwin). See Schaffer, "Babbage's Intelligence," 225. In its obsolescence the Engine recalls Prony's tables, which, though recognized as a monumental achievement, were, in practice, barely put to use. See Daston, 184. The fragment of the Engine is now held by the Science Museum in London; the Silver Lady has been lost.

²⁷ Menabrea, 94.

colleague and collaborator, explained that the Engine was “not merely adapted for *tabulating* the results of one particular function and of no other, but for *developing* and *tabulating* any function whatever,” and that the two machines would “hold to each other the same relationship as that of analysis to arithmetic”: while “the results [the Difference Engine] can arrive at lie within a very clearly defined and restricted range,” there would be “no finite line of demarcation which limits the powers of the Analytical Engine.” The Analytical Engine’s capacities would therefore be “co-extensive with our knowledge of the laws of analysis...and need be bounded only by our acquaintance with [them]”: indeed, she suggests, the Engine could be considered “the *material and mechanical representative* of analysis.”²⁸ That is, analysis, which had been metaphorized since the seventeenth century as the act of deconstructing a machine, would now be both signified and supplemented by the building of one, as one of the constitutive activities of the natural philosopher devolved to a technological object. As an “apparatus capable of aiding human weakness,” the Engine was part of a continuing redefinition of what both “human” and “weakness” meant: the “man of genius,” whose ingenuity had previously been exercised through the embodied labour of empirical investigation, was now characterized as “discourag[ed]” by “the perspective of a long and arid computation.” Demanding “time exclusively for meditation,” he finds it “snatched from him by the material routine of operations,” the “laborious route of analysis.”²⁹ Babbage’s proposal to construct an Analytical Engine suggests that, as embodiment and subjectivity were

²⁸ Lovelace, 119-121.

²⁹ Menabrea, 113.

remade across the long eighteenth century alongside and through technological objects, it became increasingly possible to imagine machines taking on functions once thought to define human selfhood.

Like the Difference Engine, however, the Analytical Engine was never actually built, remaining instead a mental and textual machinery.³⁰ The unrealized invention has had a long afterlife, though: with the advent of electronic computers, Babbage has been lauded as the “father” or “ancestor” of the digital age for designing of a machine that shares many of the basic structures and functions of modern computing technology.³¹ Though the similarities between the Analytical Engine and modern computers are undeniable—most notably, Babbage planned to divide the function of his machine between a memory and a processor, and guide the apparatus’s calculations with removable programs—scholars have shown that there is no direct connection between the

³⁰ In the 1880s, after Babbage’s death, his son Henry Babbage constructed a portion of the Analytical Engine that was only partially functional. See Dan Halacy, *Charles Babbage: Father of the Computer* (New York: Crowell, Collier Press, 1970), 148-49. In 1889 he abandoned the project, writing that “I see no hope of any Analytical Engine, however useful it might be, bringing any profit to its constructor, and...there is little or no temptation to do more. The history of Babbage’s calculating engines is sufficient to damp the ardour of a dozen enthusiasts.” See Henry Babbage, “On the Mechanical Arrangement of the Analytical Engine,” in *The Works of Charles Babbage*, ed. Martin Campbell-Kelly, vol. 3, *The Analytical Engine and Mechanical Notation* (1889; London: William Pickering, 1989), 204-205. The fragment of the Engine constructed by Henry Babbage is currently held by the Science Museum in London.

³¹ See, for example, Halacy’s *Charles Babbage: Father of the Computer*, and Anthony Hyman, *Charles Babbage: Pioneer of the Computer* (Oxford: Oxford University Press, 1982), in which Hyman argues that “Charles Babbage stands alone: the great ancestral figure of computing” (255). Ada Lovelace has likewise been named a “prophet of the computer age” and “The World’s First Hacker”; in this case the impulse is understandable as a feminist attempt to recuperate a foremother in the still largely masculine field of computer science (an attempt that nonetheless tends to obfuscate Lovelace’s contribution by positioning it mainly in relation to contemporary technologies). See Betty Alexandra Toole, *Ada, The Enchantress of Numbers: Prophet of the Computer Age, A Pathway to the 21st Century* (Mill Valley: Strawberry Press, 1998), i.

Analytical Engine and computers invented in the twentieth century.³² As Doron Swade writes,

There is no unbroken line of development between Babbage's work in the nineteenth century and the modern computer. His Analytical Engine was a developmental cul-de-sac....the movement that led to the modern computer did not resume until the 1940s when pioneers of the electronic age of computing rediscovered many of the principles explored by Babbage, largely in ignorance of his designs...The electronic age of computing was informed by the spirit and tradition of Babbage's work rather than any deep knowledge of his designs which have attracted detailed attention only in the last few decades.³³

In my final remarks here, I will consider the ways in which it is appropriate to locate contemporary computers as part of the “spirit and tradition” of Babbage's early-nineteenth-century work, and how we might critically consider the implications of citing this invention as “Babbage's Dream Come True.”³⁴ While historians have often looked back at Babbage to explain the defining technology of modern life, looking forward from the eighteenth century towards both Babbage's Analytical Engine and the computers supposedly possessed of its “spirit” allows me to explore how early modern mechanisms of gender difference continue to haunt contemporary technologies of the self.

What interests me most about the Analytical Engine's proposed operation is how it was premised on principles adapted from systems of mechanized textile manufacture developed in the late eighteenth and early nineteenth century. The two main parts of Babbage's machine—what we now understand as the memory and processor—were

³² See Margaret Ann Boden, *Mind As Machine: A History of Cognitive Science*, Vol. 1 (Oxford: Oxford University Press, 2008), 162-167 for a detailed analysis of the relationship between Babbage's work and modern computing.

³³ Quoted in Boden, 167.

³⁴ This phrasing is the title of a 1946 review of a book written by scientists at IBM called *A Manual of Operation for the Automatic Sequence Controlled Calculator*; it is quoted in Herman H. Goldstine's *The Computer: From Pascal to von Neumann* (Princeton: Princeton University Press, 1972), 112.

named by him the “store” and the “mill.” The store or “storehouse” held numbers, while the mill “carried out numerical operations, such as addition, subtraction, multiplication, and division, using numbers brought from the store.”³⁵ Hyman explains that this framework and terminology was borrowed from “cotton mills”: the Engine’s numbers “were held in store, like materials in the storehouse, until they were required for processing in the mill or despatch to the customer” (166). The action of processing information with the Analytical Engine was thus directly linked, materially and conceptually, to the processing of raw cotton fibres into spun thread. Though the Engine’s function was understood to supplement a “man of genius[’s]” intellect by performing “reasoning labours,”³⁶ its actual operations mirror a process of “culturing” enacted through the refinement of cotton, and grounded, as I have shown, in the mechanized appropriation of female labour. The Analytical Engine is, then, an artifact of the vital late-eighteenth-century relationship between cotton processing and the cultivation of a British power at once intellectual, technological, and imperial. Like the Difference Engine, the Analytical Engine seeks to replace industrialized workers with an entirely mechanical system, thus carrying the logic of the textile industry’s mechanization to its conclusion.

The Analytical Engine’s other major component—what we would now call its programming—was likewise borrowed from the textile manufacture. The Engine’s operation was to be programmed with a series of punched cards, an idea drawn, as

³⁵ Hyman, 166.

³⁶ Menabrea, 113, 93.

Lovelace explains, from automatic looms introduced at the turn of the nineteenth century, and specifically “the principle which Jacquard devised for regulating, by means of punched cards, the most complicated patterns in the fabrication of brocaded stuffs.”³⁷ Jacquard’s punched cards provided an elegant solution to the problem of storing “large amounts of information to be read, not visually, but mechanically.”³⁸ So it was that, in Lovelace’s famous and evocative analogy, “We may say most aptly that the Analytical Engine *weaves algebraical patterns* just as the Jacquard loom weaves flowers and leaves.”³⁹ Like the mechanization of the British cotton manufacture, the invention of this automatic brocade loom in France was an endeavour premised in the appropriation and replacement of women’s labour by a technological system. Before Jacquard’s invention, women textile workers called *tireuses* (or “drawgirls”) advanced the complex brocade patterns, first “activat[ing] the warp threads” by pulling a cord, and then, after each pass of the loom’s shuttle, pulling down the semple—a “group of cords that hung alongside the loom”—thus “bringing into reach the next series of looped cords that determined the subsequent line of the pattern.”⁴⁰ When, in the second half of the eighteenth century, the silk industry sought more efficient methods, “[a]ttention focused on the invention of a brocade loom that could be worked by one weaver alone,” such that “[e]liminating the drawgirls...from the weaving process became almost an obsession among silk

³⁷ Lovelace, 121.

³⁸ Philip Morrison and Emily Morrison, “History of Punch Cards,” in *Charles Babbage and his Calculating Engines: Selected Writings by Charles Babbage and Others*, ed. Philip Morrison and Emily Morrison (London: Dover, 1961), xxxiii.

³⁹ Lovelace, 121.

⁴⁰ Daryl M. Hafter, “The Programmed Brocade Loom and the ‘Decline of the Drawgirl,’” in *Dynamos and Virgins Revisited: Women and Technological Change in History*, ed. Martha Moore Trescott (Metuchen: Scarecrow Press, 1979), 50-51.

producers.”⁴¹ With the introduction of Jacquard’s loom, this ambition was realized: drawgirls were replaced by chains of perforated cardstock, and male weavers controlled silk brocade production. This history shows us that, just as the Analytical Engine’s structure and function was grounded in systems of industrial textile production that depended on the appropriation of women workers’ embodied labour, so too was the paper punch-card programming that would allow it to “read” its orders.

Though there was little actual connection between the introduction of electronic computers in the early twentieth century and Babbage’s Analytical Engine, this (re)invention replicated the Engine’s material and conceptual relationship to embodied labour and gender difference in uncanny ways. In the United States, the Electronic Numerical Integrator and Computer (ENIAC)—“America’s first electronic computer”—was developed in the early 1940s, during another key moment of imperial nationbuilding.⁴² The ENIAC was invented to “assist with the computation of ballistics tables” during World War II: it would compute the “firing and bombing tables considered necessary during World War II to assist gunners in targeting high speed aircraft.”⁴³ Before the ENIAC’s invention, “women ‘computers’ using hand calculators” had “performed the mathematics to compile these ballistic tables,”⁴⁴ since the work of computing (devalued at least since the creation of Prony’s tables) was categorized in the

⁴¹ Hafter, 52.

⁴² Jennifer S. Light, “When Computers Were Women,” *Technology and Culture* 40, no. 3 (1999): 455, <http://www.jstor.org/stable/25147356>. Alan Turing’s Colossus was developed at the same time, and in a similar wartime context: it functioned as a “decoding machine designed to unscramble German radio transmissions.” See Ruth Perry and Lisa Greber, “Women and Computers: An Introduction,” *Signs* 16, no. 1 (1990): 83, <http://www.jstor.org/stable/3174608>.

⁴³ Perry and Greber, 84.

⁴⁴ Perry and Greber, 84.

early twentieth century as a kind of feminized clerical labour.⁴⁵ The intricate and intellectually challenging work of hand-calculated ballistics computation⁴⁶ proceeded, however, at a pace considered “too [slow] for wartime needs,” spurring the development of an electronic computer to complete the calculations. With the invention of the ENIAC, a machine took on the name previously assigned to the women workers who performed the labour it annexed: “computer.”⁴⁷ This appropriation of labour, which mirrored that undertaken with devices like the spinning jenny, was accomplished through the material technology that had facilitated the drawgirl’s extinction: the ENIAC’s digital calculations were programmed with the same kind of punched cards introduced in Jacquard’s loom and subsequently adapted by Babbage for use in his imagined Analytical Engine. And, while women performed the essential work of actually entering equations into the ENIAC, which still “required human intervention to set up mathematical problems,” this labour was made invisible as the computer’s power was attributed to its ingenious technology rather than to the “ENIAC girls” who both patterned and programmed its functions.⁴⁸ Publicity images for the ENIAC that included female programmers, for

⁴⁵ Light, 458. Herman Goldstine, one of the heads of the ballistics research project that produced the ENIAC, later said that “The men we employed were almost all men who wanted Ph.D.’s in math or physics. This [hands-on work] was a bit distasteful. I think they viewed what they were doing as something they were not going to be doing as a career” (Quoted in Light, 459n11). As Light writes, “While college-educated engineers considered the task of computing too tedious for themselves, it was not too tedious for the college-educated women who made up the majority of computers” (461).

⁴⁶ Light quotes computer Kathleen McNulty, who describes at length the painstaking and highly skilled work she and her colleagues carried out to complete the ballistics computations. See Light, 463-64.

⁴⁷ Light cites a report from February 1945 clarifying this shift, in which George Stibbitz writes that “Human agents will be referred to as ‘operators’ to distinguish them from ‘computers’ (machines)” (469n40).

⁴⁸ Light, 468, 462, 472.

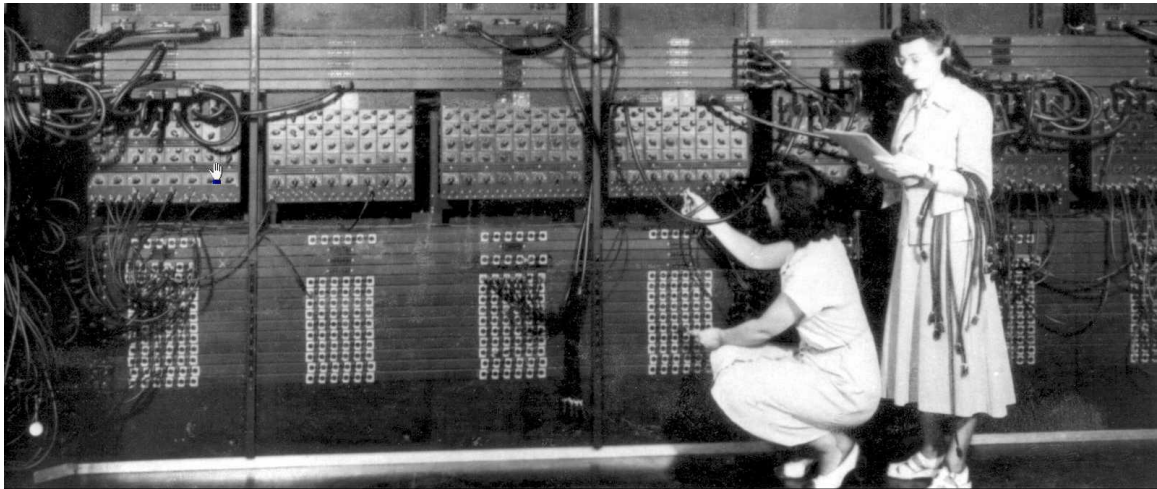


Figure 15: Gloria Ruth Gordon and Ester Gerston programming the ENIAC, 1940s, via <http://www.columbia.edu/cu/computinghistory/eniac.html>.

instance (see fig. 15), were deemed “unsuitable” for dissemination; instead, the machine was shown in isolation, or alongside its male engineers.⁴⁹

While there is certainly no teleological relationship between the late-eighteenth-century textile manufacture’s mechanization (which would inspire the form and function of Babbage’s Analytical Engine) and the invention of computers in the early twentieth century, the striking similarities between these two historical developments suggest how the systems of technological modernity textually and materially fashioned across the long eighteenth century—and the modern forms of subjectivity and embodiment produced through them—continue to structure the relationships between technology and gendered selfhood into the twentieth and twenty-first centuries. Viewed in this light, the effort by some historians of computer science to situate Babbage as the originary ancestor of a technological lineage stretching to the present day bespeaks not his personal “fatherhood”

⁴⁹ Light, 474-77.

of digital modernity but rather that modernity's continuing embeddedness in the structures that shaped Babbage's project, an embeddedness now mainly intelligible through the paradigm of male ingenuity and its products. If we look beyond such triumphal histories, we can see other consonances between modern digital functions and eighteenth-century systems of technological modernity—consonances that escape (or are erased by) these narratives.

Consider, for example, the unprecedentedly easy access to vast collections of books currently afforded by digital archives like Google Books (and its subscription-only academic counterparts, such as the Eighteenth-Century Collections Online and Early English Books Online archives I have used extensively in preparing this dissertation). The experience of using an archive like Google Books evinces many of the hallmarks of modern digital function, providing quick, intuitive access to information in a way that vastly reduces the amount of labour undertaken by the reader or researcher. And yet, as Shawn Wen has recently shown, this access relies on the hidden labour of workers who undertake the “painstaking work of scanning texts” for little compensation: workers who are largely racialized women.⁵⁰ As Wen writes,

Human hands have to individually scan the books, to open the covers and flip the pages. But when Google promotes its project—a database of “millions of books from libraries and publishers worldwide”—they put the technology, the search function and the expansive virtual library in the forefront. The laborers are erased from the narrative, even as we experience their work firsthand when we look at Google Books.

⁵⁰ Shawn Wen, “The Ladies Vanish,” *The New Inquiry*, 11 November 2014, <http://thenewinquiry.com/essays/the-ladies-vanish/>.

Wen points out that the same kind of imperceptible labour powers Amazon's "Mechanical Turk" program, which "hires people to do invisible work online—work which makes their client companies' software look flawless": things like "accurately transcribing text from audio, detecting the quality or tone in a piece of writing, identifying what's depicted in a photograph."⁵¹ This labour (performed by a poorly-paid contingent workforce that is over 70% female) is, in fact, what drives digital innovation. Learning from the information workers input, "computers have dramatically improved in recent years at facial recognition, translation, and transcription," tasks "previously thought to be impossible for computers to complete accurately": or, as Wen puts it, "mechanical turkers (mostly women) teach computers to do what engineers (mostly men) cannot on their own program computers to do."⁵² The program takes its name from an eighteenth-century chess-playing automaton, a mechanism that was secretly run by a person hidden in its interior.⁵³ The "mechanical turking" that grounds the operation of digital technologies like Google Books is linked to the eighteenth century by more, however, than its clever name. The digital archive's trick is to show us everything we want to see at the moment we want to see it, a marvel it accomplishes by making invisible the women who enable this vision. Their embodied labour is essential to the archive, but cannot be admitted by or into its technology. Such women surface only in instances marked as error, when the worker's hand reveals itself to the reader's eye, suddenly refusing erasure (See figs. 16-19). Recalling at once the mechanized cotton

⁵¹ Wen.

⁵² Wen.

⁵³ Wen.

manufacture, the calculating Engine that took its form, and the computing technologies through which the archive runs, once again a new system is founded on the disavowed bodies of women, which create technological ingenuity by being pressed into its service, then abjected from it. This example suggests that digital modernity in many ways still operates within the structures of difference forged during the long eighteenth century, when technology and selfhood were mutually defined. Considering eighteenth-century technologies of the self thus asks us to recognize our enmeshment in these artificial productions of difference, and so to ask: what do we make when we create innovation? What do we obscure when we see everything?

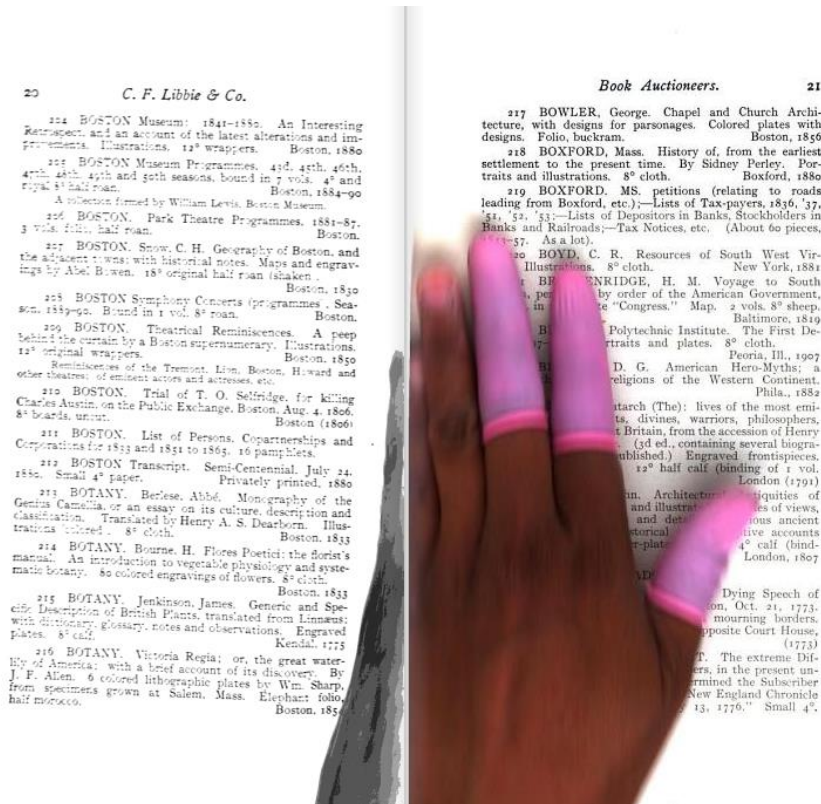


Figure 16: Worker's hand covers C.F. Libbie & Co's *Auction Catalogue, Part 2* (1750). Image via "The Art of Google Books," <http://theartofgooglebooks.tumblr.com/post/104766093100/employees-hand-covers-text-from-p-20-21-of>



Figure 17: Worker's hand covers an advertisement in James Boswell's *The Life of Samuel Johnson*, vol. 4 (London: Talboys, 1826). Image via "The Art of Google Books," <http://theartofgooglebooks.tumblr.com/post/9703063012/hand-of-employee-turning-pages-from-front>

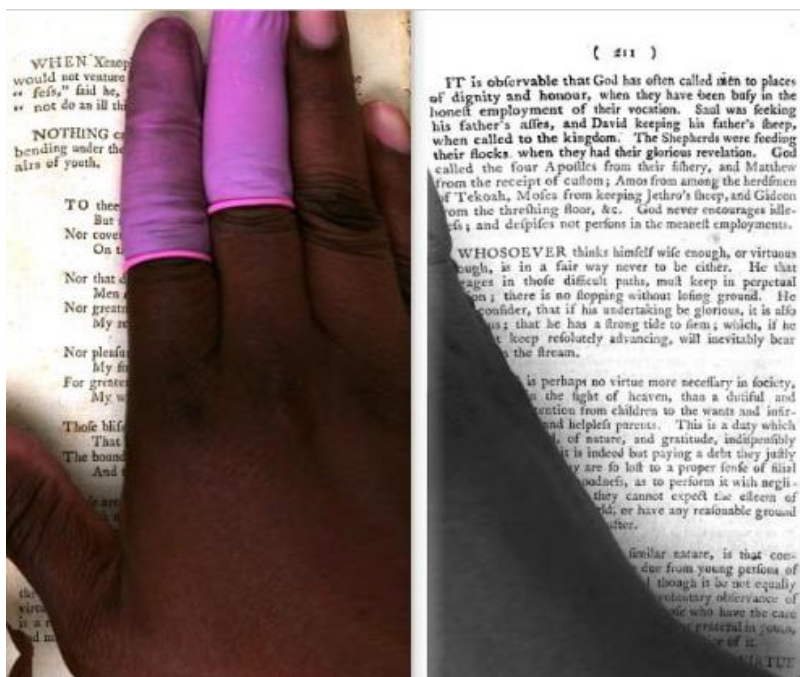


Figure 18: Worker's hand covers *Miscellanies, Moral and Instructive, in Prose and Verse* (London: J. Phillips, 1787). Image via "The Art of Google Books," <http://theartofgooglebooks.tumblr.com/post/15508917114/hand-of-employee-obscures-text-from-p-210-211>



Figure 19: Worker's hands photographed opening Charles Babbage's *Passages from the Life of a Philosopher* (1864), as digitized for Google Books. Screenshot by the author. Via <https://archive.org/stream/passagesfromlif00babbgoog#page/n2/mode/2up>.

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