

Margaret Cavendish, The Last Natural Philosopher

Justin Begley



University College
University of Oxford

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Abstract

This thesis uses the entirety of Margaret Cavendish's archive to present the first full account of her thought within its historical context. Living in France, the Netherlands, and England, Cavendish's ideas were honed and in some cases prompted by her correspondences with figures who were central to the Republic of Letters, such as Constantijn Huygens, Samuel Sorbière, and Kenelm Digby. In their turn, a wide range of Cavendish's contemporaries rigorously engaged with her publications. Bringing atomism from France to England, she encouraged Walter Charleton's translation of Pierre Gassendi's *Animadversiones*; Thomas Shadwell's critique of the Royal Society in his popular satirical play, *The Virtuoso*, was based on *The Blazing World*; Arthur Annesley heavily annotated Cavendish's *De vita ... Guilielmi ducis Novo-Castrensis* in preparing his own Latin history; Susan Du Verger wrote a folio-length response to Cavendish's reflections on monasticism; and Nehemiah Grew read her medical treatise when developing his comparative anatomy. Far from being the eccentric and isolated "Mad Madge" of common repute, I recover Cavendish as one of the most prolific and philosophically informed English writers of the seventeenth century.

When Cavendish's ideas have been studied in relation to those of other thinkers, she has usually been aligned with *novatores*, especially Thomas Hobbes and René Descartes. While these figures were "philosophers" insofar as they held undergraduate degrees, they desired to cleanse philosophy of the Aristotelian detritus of the university curriculum in which it had long been submerged. Paradoxically, I show that it was precisely because of Cavendish's *lack* of a formal education that she was more willing to align herself with the universities, and with the mainstream of seventeenth-century

thought, than Hobbes and Descartes. Pushing back on the historiographical consensus, I show that through her career-long dialogue with editions, commentaries, and translations of ancient mythology, history, and natural philosophy, Cavendish cleaved to Aristotelian principles and categories as an antidote to the intellectual and religious turmoil of her times. In doing so, I argue that she produced the first (and last) work of traditional natural philosophy composed wholly in the English vernacular. Rather than priming her to embrace a closed and dogmatic set of philosophical precepts, this thesis underscores the inherent plurality of Aristotelian natural philosophy.

The first chapter studies Cavendish's 1653 *Poems, and Fancies* in relation to the mythological publications of Francis Bacon and George Sandys, and the atomic writing of Pierre Gassendi and Thomas Harriot. Turning from her atomism, the second chapter discusses the material spirits of her 1653 *Philosophicall Fancies* and her 1655 *Philosophical and Physical Opinions*. It demonstrates that Cavendish's opposition to the mathematical and mechanical corpuscles of Descartes, and her interest in the traditions of Galenic and chymical medicine, inspired this shift in her substance theory. The third chapter moves from one higher discipline to the next by studying the theological ideas of Cavendish's 1664 *Philosophical Letters*. It argues that she developed a Reformed Anglican theology against the heterodox Platonic philosophy and cabalistic theology of Henry More and Joseph Glanvill. Shifting the target of her criticism, the fourth chapter finally studies how Cavendish manipulated Thomas Stanley's *History of Philosophy* to critique the Royal Society in her 1666 *Observations Upon Experimental Philosophy* and the *Blazing World*.

Bookended by the influences of Gassendi and Thomas Stanley, Cavendish

manipulated the more discursive and hermeneutic modes of Aristotelian thought to cultivate a continuum between literature as imaginative writing and *literae humaniores* as an embodiment of the encyclopaedia of learning. By building on methodologies not only from literary history, but also from the histories of science, philosophy, and scholarship, my work shows that Cavendish's oeuvre is one of the most powerful examples of the degree to which the seventeenth-century realms of the "new philosophy", literature, and learning were intertwined.

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Bibliography

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Abbreviations

<i>BHM</i>	<i>Bulletin of the History of Medicine</i>
<i>BJHP</i>	<i>British Journal of the History of Philosophy</i>
<i>BJHS</i>	<i>British Journal of the History of Science</i>
BL	British Library, London
Bod.	Bodleian Library, Oxford
<i>ELH</i>	<i>English Literary History</i>
<i>ESM</i>	<i>Early Science and Medicine</i>
<i>HJ</i>	<i>The Historical Journal</i>
<i>HLQ</i>	<i>Huntington Library Quarterly</i>
<i>IHR</i>	<i>Intellectual History Review</i>
<i>JHI</i>	<i>Journal of the History of Ideas</i>
<i>JWCI</i>	<i>Journal of the Warburg and Courtauld Institutes</i>
NUL	Nottingham University Library
<i>OED</i>	<i>Oxford English Dictionary</i>
<i>OFB</i>	<i>Oxford Francis Bacon (2000-)</i>
<i>ODNB</i>	<i>Oxford Dictionary of National Biography</i>
<i>RQ</i>	<i>Renaissance Quarterly</i>
<i>SEL</i>	<i>Studies in English Literature, 1500-1900</i>
<i>SHPS</i>	<i>Studies in the History and Philosophy of Science</i>
<i>SP</i>	<i>Studies in Philology</i>

Notes on Text

Quotations from manuscripts and early printed books have been supplied as they appear in the original, with the exception of normalising *u/v* and *i/j* spellings. Insertions are signalled by <chevrons>, deletions with a ~~striketrough~~, and underlining as in the original.

Bibliographical references are all repeated in the bibliography. For all secondary (post-1800) sources, what appears in the bibliography as: Feingold, Mordechai.

“‘Experimental Philosophy’: Invention and Rebirth of a Seventeenth-Century Concept”, *ESM*, 21.1 (2016), 1-28, appears first in the text as Feingold, “‘Experimental Philosophy’: Invention and Rebirth of a Seventeenth-Century Concept” (2016), and subsequently as Feingold, “‘Experimental Philosophy’”. The city and date of publication are provided in the first bibliographical reference for all primary (pre-1800) sources.

Introduction: The Singular and Plural

Most students and scholars of the early modern period who are acquainted with Margaret Cavendish know of her as singular and eccentric: “Mad Madge”. Providing historical precedence for this evaluation, Dorothy Osborne wrote to William Temple on May 7, 1653, that she had seen Cavendish’s newly published *Poems, and Fancies* and was “sattisfyed that there are many soberer People in Bedlam”.¹ Mary Evelyn took the related view that Cavendish should be “confined within four walls” in a letter to the clergyman, Fellow of New College, and tutor to the Evelyns’ son, Ralph Bohun. She expressed surprise that “both Universities court” Cavendish and that she has gained “the suffrages of y^r fellow Collegiats”.² In due course, the opinions of Osborne and Evelyn prompted Virginia Woolf’s exclamation in her 1929 *A Room of One’s Own*: “What a vision of loneliness and riot the thought of Margaret Cavendish brings to mind! as if some giant cucumber had spread itself over all the roses and carnations in the garden and choked them to death”.³ In forming a canon of women writers, much has been made of these comments. There is, however, a more interesting and complex history that looms behind Evelyn’s letter. In an attempt to unearth this little-known narrative, this dissertation uses the totality of the Cavendish archive to investigate her interactions and affinities with the mostly male intellectual world of the seventeenth century, and especially with the learned establishments of her day: the universities of Oxford and Cambridge, the Royal College of Physicians, and the Church of England.

¹ For the relevant letters, see Osborne, *The Letters of Dorothy Osborne to William Temple* (2013), 35-8 and 41-2.

² Add. MS 78539, ff. 5r. For a clean version of this letter, see *Diary and Correspondence of John Evelyn*, ed. by Bray, Vol. 4, 8-9. On Cavendish and Mary Evelyn, see Harris, “Living in the Neighbourhood of Science: Mary Evelyn, Margaret Cavendish and the Greshamites” (1997).

³ Woolf, *A Room of One’s Own* (2001), 74-5.

In her now classic essay from 1988, Catherine Gallagher crystallised the current widespread conception of Cavendish by turning what Woolf saw as a vice into a virtue, arguing that Cavendish was an “absolute female subject”.⁴ By this she meant that Cavendish’s Royalism granted her the solitude and freedom necessary to write, implying that the “conservativism” of women writers served as a precursor to the liberal values of female self-determination and individualism. The “difference feminism” that reinforced this appraisal soon went out of fashion, yet the reading of Cavendish as an outlier still persists on many fronts today.⁵ Most of the studies that foreground Cavendish’s singularity have paid little notice to her philosophy or the seventeenth-century notions of “originality” and “newness” with which she was working. Woolf’s assumption that Cavendish was a poet who made a misguided and failed foray into natural philosophy has implicitly engendered such neglect, particularly among literary critics. To bolster their narratives, scholars have concentrated on Cavendish’s 1662 *Playes* and 1666 *The Blazing World*, consistently ignoring that the latter was an appendix to *Observations Upon Experimental Natural Philosophy*.

Some of the most recent research has started to look at Cavendish’s philosophical output in relation to the publications of her contemporaries, typically aligning her with

⁴ See Gallagher, “Embracing the Absolute: The Politics of the Female Subject in Seventeenth-Century England” (1988).

⁵ On difference feminism, see the essays in *Beyond Equality and Difference: Citizenship, Feminist Politics and Female Subjectivity*, ed. by Bock and James (1992). Some works following Gallagher in emphasising Cavendish’s feminine originality and individuality are Ankers, “Margaret Cavendish and the Nature of the Individual” (2000); Trubowitz, “The Reenchantment of Utopia and the Female Monarchical Self: Margaret Cavendish’s *Blazing World*” (1992); D’Monté, “‘Making a Spectacle’: Margaret Cavendish and the Staging of the Self” (2003); Hobby, “‘Delight in a Singularity’: Margaret Cavendish, Duchess of Newcastle, in 1671” (2000); Gardiner, “‘Singularity of Self’: Cavendish’s *True Relation*, Narcissism, and the Gendering of the Individual” (1997); Green and Broad, “Fictions of a Feminine Philosophical Persona: Christine de Pizan, Margaret Cavendish, and *Philosophia Lost*” (2006). This discourse has even won Cavendish a chapter in a handbook to individualism: see Heffernan, “‘A World of My Own Creating’: Private Worlds and Social Selves in Margaret Cavendish’s *Blazing World*” (2011).

the seventeenth-century *novatores*, chiefly Thomas Hobbes.⁶ Based on the observation that Hobbes was “effectively a Cavendish household philosopher”, this discourse has sought to demonstrate that he was the principal influence on her ideas.⁷ Without seeking to deny the importance of Hobbes to the Cavendish family, we will see that when Margaret did examine Hobbes’s philosophical opinions she was often critical of them. In both the scholarship stressing her singularity and this recent work, there has been a tendency to tease political meaning out of passages that Cavendish did not shape with such import. In this regard, it is notable that Cavendish tackled the “*Natural Philosophy*” of *Leviathan* in her 1664 *Philosophical Letters*, but was “forced to stay” her pen upon realising that “he treats in his following Parts of the Politicks”. She supplies three reasons for bypassing Hobbes’s political views: “First, That a Woman is not imployed in State Affairs, unless an absolute Queen. Next, That to study the Politicks, is but loss of Time, unless a man were sure to be a Favourite to an absolute Prince. Thirdly, That it is but a deceiving Profession, and requires more Craft then Wisdom”.⁸ By simultaneously appealing to her status as a woman to justify her disregard for politics and accepting that a Queen could be a legitimate ruler, Cavendish affirmed conventional gender differences and acknowledged that these were less than absolute. Such duality has confused and disappointed those scholars who have hoped to discover in Cavendish a forerunner to

⁶ For some examples of this now sizeable body of literature, see James, “Introduction”, *Margaret Cavendish: Political Writings* (2003), ix-xxix; Barnes “Familiar Epistolary Philosophy: Margaret Cavendish’s *Philosophical Letters* (1664)” (2009); Sarasohn, “Leviathan and the Lady: Cavendish’s Critique of Hobbes in the *Philosophical Letters*” (2003); Ankers, “Paradigms and Politics: Hobbes and Cavendish Contrasted” (2003); Detlefsen, “Margaret Cavendish and Thomas Hobbes on Freedom, Education, and Women” (2012); Semler, “Margaret Cavendish’s Early Engagement with Descartes and Hobbes: Philosophical Revisitation and Poetic Selection” (2012); Lobis, *The Virtue of Sympathy: Magic, Philosophy, and Literature in Seventeenth-Century England* (2015), 69-109; Hutton, “In dialogue with Thomas Hobbes: Margaret Cavendish’s *Natural Philosophy*” (1997); O’Neill, “Introduction”, *Observations Upon Experimental Philosophy* (2001), x-xxxvi; and Green and Broad, *A History of Women’s Political Thought in Europe, 1400-1700* (2009), 199-224.

⁷ Norbrook, “Introduction”, *The Works of Lucy Hutchinson* (2012), xxxiv.

⁸ Cavendish, *Philosophical Letters* (London, 1664), 47.

twentieth-century feminism.⁹ Yet, as Ian Maclean has documented, the *querelle des femmes* did not so much undermine social conventions to establish the equality of the sexes in concrete social or political terms as it stimulated a re-evaluation of the relationship between men and women in Biblical and classical *loci*.¹⁰

An epistle to Cavendish from the Bodleian librarian, Lady Margaret Professor, and Archdeacon of Oxford, Thomas Barlow, is germane here. He writes that there is “a Manuscript Author in *Bodlies* Library, who endeavors to shew, *That Women excell Men*: your Excellency has proved what he proposed, has done what he indeavored, and given a demonstrative argument to convince the otherwise unbelieving World”. Barlow clarifies in a subsequent letter that he is referring to a manuscript treatise by the All Souls fellow, William Page, titled “Womans worth: Or a treatise proving by sundry reasons that women doe excell men” that is now MS Bodleian 1030.¹¹ Beginning with an explanation of why Adam was more sinful than Eve—before supplying many examples of women in scripture who surpassed men in piety, wisdom, and charity—Page’s treatise is a compelling piece of Biblical scholarship. His work follows a noble lineage of literature in

⁹ Along with those in footnote 7, see Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution* (1980), 268-74; Sarasohn, “A Science Turned Upside Down: Feminism and the Natural Philosophy of Margaret Cavendish” (1984); Rogers, *The Matter of Revolution: Science, Poetry, and Politics in the Age of Milton* (1996), 177-204; Miller, *Engendering the Fall: John Milton and Seventeenth-Century Women Writers* (2008), 136-67; Kegl, “‘The World I have made’: Margaret Cavendish, Feminism, and the *Blazing-World*” (1996); and Wilputte, “Margaret Cavendish’s Imaginary Voyage to *The Blazing World*: Mapping a Feminine Discourse” (1995). While playing by the same terms, a useful antidote to this discourse is Boyle, “Margaret Cavendish’s Nonfeminist Natural Philosophy” (2004). See further Vickers, “Francis Bacon, Feminist Historiography, and the Dominion of Nature” (2008).

¹⁰ Maclean, *Woman Triumphant: Feminism in French Literature, 1610-1652* (1977) and *The Renaissance Notion of Woman: A Study in the Fortunes of Scholasticism and Medical Science in European Intellectual Life* (1990); I draw on the latter freely in what follows.

¹¹ Cavendish, *A Collection of Letters and Poems* (London, 1678), 169 and 70; hereafter *Letters and Poems*. The first letter is dated 1663 and the second 1656, but his reference to the previous letter in the latter suggests that it should actually read 1666. Also see Page’s work on widowhood in Bod., MS Bodley 115. Of further interest is John Evelyn’s copy of “Womans worth” in BL, Add. MS 78415, and his display of knowledge regarding the history of women’s writing in a letter to Cavendish (see Evelyn, *The Letterbooks of John Evelyn*, ed. by Galbraith, Vol. 1 (2014), 552-5).

English that includes David Clapham's translations from the German polymath Cornelius Agrippa, his 1540 *The commendation of matrimony* and 1542 *A treatise of the nobilitie and excellencye of woman kynde*; Thomas Elyot's 1545 *The defense of good women*; and Edward More's 1560 *A lytle and bryefe treatyse, called the defense of women*. Especially with Queen Elizabeth I's accession to the throne in 1558, a mainstay of this discourse was the question: how could a woman, traditionally thought to be of an inferior sex that required marital guidance, govern a kingdom? Elizabeth's leadership met with opposition among the most conventional intellectuals. But others, such as the Oxford scholar John Case, argued that the Aristotelian commonplace that men achieved moral perfection by commanding and women through obedience was only a general dictum.¹² Due to the Aristotelian-Galenic focus on the biological basis of virtues and vices in individual tempers (which is discussed in 2.2 and 4.2), it was possible to speak of "women with manly virtues". Neither a paradox nor a monstrous oddity, this was a way to stress the psychological qualities of a particular woman while suggesting that "manliness/maleness" and "effeminacy/femaleness" were not entirely equivalent. Insofar as the preceding generation's debates surrounding an absolute female leader cleared the way for Cavendish to publish—and Elizabeth herself cultivated the image of a learned Queen—it had more to do with circumventing than cementing gender differences.¹³

Notwithstanding the widespread realisation that sex did not wholly determine gender, few mid-seventeenth-century thinkers seriously proposed that women in general

¹² See Maclean, *Renaissance Notion of Woman*, 60-2.

¹³ On Elizabeth I's learning, see Benkert, "Translation as Image-Making: Elizabeth I's Translation of Boethius's *Consolation of Philosophy*" (2001) and Shenk, *Learned Queen: The Image of Elizabeth I in Politics and Poetry* (2010). For this as a debate of continued relevance into the latter half of the seventeenth-century, see John Cotton's commonplace book: Folger Library, V.a.344, 39r-42v. He concludes a disputation over whether "women ought to be admitted to the Supreme Authority" with the rhetorical question: "what was ever more glorious then the raigne of Queen Elizabeth of blessed memory?".

could match or excel men in learning. Though the situation was slightly different elsewhere in Europe, female philosophers remained a rarity in England, with only the likes of Anne Conway and Lucy Hutchinson joining Cavendish.¹⁴ Due in part to her exceptionality, Cavendish was keen to defend the established order that enabled her to cultivate the status of a philosopher. We will see throughout this study that she routinely affirmed social norms such as the restriction of women to the household, and claimed to embody the standard feminine virtues of humility, patience, compassion, and charity. As Cavendish discerned, the expectation that women would manage the domestic sphere left her not only free but obliged to facilitate discussions in the courts and salons. To this end, influential humanists such as Agrippa, Juan Luis Vives, and Desiderius Erasmus even endorsed female learning, despite opposing their inclusion in learned institutions.¹⁵

It may be objected that Cavendish's practice of publishing deviated from the modesty that women were urged to cultivate, yet print did not have a place in classical and Biblical authorities. Women also fulfilled considerable roles in the printing press, even if they did not usually publish themselves.¹⁶ Apologies for writing pervade Cavendish's prefaces even so, and, manipulating the standard courtly mode of *sprezzatura*, she periodically brings her motivation for publishing down to the fickle

¹⁴ See Hutton, *Anne Conway: A Woman Philosopher* (2004); White, *The Legacy of Anne Conway (1631-1679): Reverberations from a Mystical Naturalism* (2008); and Norbrook, "Introduction", *The Works of Lucy Hutchinson*. On learned women in other parts of Europe, see the essays in *Beyond their Sex: Learned Women of the European Past* (1984) and Jardine, "'O Decus Italiae Virgo' or The Myth of the Learned Lady in the Renaissance" (1985).

¹⁵ See Maclean, *Renaissance Notion of Woman*, 56-7 and 64-7. Also see Vives, *The Education of a Christian Woman: A Sixteenth-Century Manual*, ed. by Fantazzi (2000) and Grafton and Jardine, *From Humanism to the Humanities: Education and the Liberal Arts in Fifteenth and Sixteenth-Century Europe* (1986), 29-57.

¹⁶ On women and the printing press, see Smith, '*Grossly material things*': *Women and Book Production in Early Modern England* (2012) and McDowell, *The Women of Grub Street: Press, Politics, and Gender in the London Literary Marketplace, 1678-1730* (1998).

womanly desire for public acknowledgement.¹⁷ In this way, she could appeal to a vice to explain (if not justify) her deviations from customary behaviour, without emboldening other women. All this is to say that a seventeenth-century discourse on sex and gender did not preclude the participation of a woman such as Cavendish in intellectual life. Nonetheless, neither a Queen nor eager to overturn moral categories, Cavendish mostly restricted herself to literary or philosophical rather than political topics.¹⁸ For this reason, what follows focuses on her ideas, and only brings in questions of gender and politics when they are directly relevant to the matter at hand.

Drawing extensively on unstudied evidence from manuscripts and early printed books—along with often-neglected pieces in Cavendish’s oeuvre—this work shows that Cavendish was far less intellectually isolated than previous accounts have implied. The Cavendishes gathered a group of thinkers around their Parisian salon from 1645-48 and frequently hosted visitors during their time at Peter Paul Rubens’ house in Antwerp from 1648-51.¹⁹ Living in France, the Netherlands, and England, Cavendish’s philosophy was honed and in some cases prompted by her correspondences with prominent figures in the Republic of Letters, such as Constantijn Huygens, Samuel Sorbière, and Kenelm Digby. In their turn, a wide range of Cavendish’s contemporaries grappled with her thought. Bringing atomic ideas from France to England, Cavendish was an inspiration behind Walter Charleton’s translation of Pierre Gassendi’s *Animadversiones*; Thomas Shadwell

¹⁷ On some of the complexities surrounding Cavendish’s discussion of fame, see Boyle, “Fame, Virtue, and Government: Margaret Cavendish on Ethics and Politics” (2006).

¹⁸ On politics, ethics, and oeconomics and their relationship to gender in early modern moral philosophy, see Kraye, “Moral Philosophy” (1988).

¹⁹ On this setting, see Weststeijn, *Margaret Cavendish in de Nederlanden: Filosofie en Schilderkunst in de Gouden Eeuw* (2008); van Beneden and de Poorter, *Royalist Refugees: William and Margaret Cavendish in the Rubens House, 1648-1660* (2006); Fitzmaurice, “Margaret Cavendish in Antwerp: The Actual and the Imaginary” (2000); and Härting, “Lord William Cavendish und Duchess Margaret Cavendish im Rubensgarten in Antwerpen” (2002).

based his critique of the Royal Society in *The Virtuoso* on *The Blazing World*; Arthur Annesley heavily annotated *De vita ... Guilielmi ducis Novo-Castrensis* when preparing his own Latin history; Susan Du Verger wrote a folio-length response to Cavendish's reflections on monasticism; and Nehemiah Grew composed a compendium to her medical treatise when developing comparative anatomy.

It is true that Cavendish was barred from the universities, and that her capacity to read Latin (though we will see that it was greater than she sometimes let on) seems to have been slight. Recognising that "classical education was for the most part confined to schoolboys", Joseph Levine states in his study of the ancients and moderns in Restoration England that it was natural "for the few women writing in the period largely to disregard a quarrel that did not concern them directly, though they must inevitably have inclined to the modern side".²⁰ For all his nuance, even David Norbrook has argued that Lucy "Hutchinson was as strong an ancient as Cavendish was a modern".²¹ But a central premise of this work is that all men and women who contributed to seventeenth-century intellectual life (including Cavendish) were in conversation with ancient poetry, history, and philosophy as it was disseminated through translations, editions, and commentaries. In both lacking a formal education and thoroughly engaging with the ancients, Cavendish was far from alone. Neither William nor Charles Cavendish attended university; figures ranging from Digby to Shadwell to George Sandys started but never finished their bachelor's degrees; and, as is well known, the likes of Hobbes and René Descartes were only educated to undergraduate standard. All of these thinkers were "amateurs" since their public occupations (or lack thereof) did not and could not relate directly to their

²⁰ Levine, *Between the Ancients and the Moderns: Baroque Culture in Restoration England* (1999), xii.

²¹ Norbrook, "Margaret Cavendish and Lucy Hutchinson: Identity, Ideology, and Politics" (2000), 185. Also see Salzman, *Reading Early Modern Women's Writing* (2006), 135-75.

research interests. Rather than accentuating her difference as a woman, Cavendish situated herself among this broad group of amateurs who developed and refined their ideas through reading, conversation, and debate in the court.

While it has been noted that there was a “convergence between scholarship and polite literary culture” in seventeenth-century France, it has usually been supposed that England was “radically inhospitable to scholarship that was capable of attracting the attention of anyone but scholars themselves”.²² Yet, between France and England, we will see that the not always polite sphere of literature and letters was of a piece with the masculine, Latinate, and canon-orientated world of scholarship for Cavendish and her courtly circles, at least until the mid-1660s.²³ The fragmentation of a more holistic approach to learning over the course of the 1660s meant that Cavendish increasingly idealised the Republic of Letters—a sizable constituency of which was based on Royalist networks and familial bonds—as having provided the proper social basis for a multiplicity of intellectual endeavours.²⁴ Following the formation of the Royal Society in 1660, however, experimentation shifted from a frivolous activity of courtiers to the predominant technique for approaching the natural world. As these circumstances unfolded, Cavendish shaped the aggrandisement of experimentation and data collection without pre-established rational frameworks as a modern departure from the wider history of philosophy. For her part, she continued to conceive of natural philosophy as a

²² Haugen, *Richard Bentley: Poetry and Enlightenment* (2011), 4-5.

²³ On women in the Republic of Letters, see Norbrook, “Women, the Republic of Letters, and the Public Sphere in the Mid-Seventeenth Century” (2004) and Pal, *Republic of Women: Rethinking the Republic of Letters in the Seventeenth Century* (2012).

²⁴ On how the ideal of the Republic of Letters deviated from the reality, the seminal account is Goldgar, *Impolite Learning: Conduct and Community in the Republic of Letters, 1680-1750* (1995). On the English setting, see Malcolm, *Aspects of Hobbes* (2002), 437-545 and “Kircher, Esotericism, and the Republic of Letters” (2004). Cf. Marshall, *John Locke, Toleration and Early Enlightenment Culture: Religious Toleration and Arguments for Religious Toleration in Early Modern and ‘Early Enlightenment’ Europe* (2009).

speculative rather than experimental endeavour. Speculative natural philosophy was always allied with the Aristotelian synthesis, and what follows demonstrates that the anti-Aristotelian rhetoric of the 1660s only strengthened this kinship.²⁵ At the very moment that it was most under siege by the Royal Society's propagandists, Cavendish not only practised but also forcefully defended the status of traditional natural philosophy. For this reason, her post-Restoration publications present one of the most palpable examples of how the traditions of Aristotelian thought endured in mid-seventeenth-century England.

Noteworthy in this respect is a short (and hitherto unnoticed) poem titled "To the Most Excellent Princess the Dutchesse of Newcastle" that was written "By H.J. of Grays-Inne, Gent" in 1667.²⁶ Grasping that Cavendish's later works relied heavily on Aristotelian doctrines, the author declares that

What cunning *Aristotle* darkly writ,
As with intent to Vizard-mask his wit;
Your Grace had drawn the Curtain, and we see
Into each crevice of his subtlety:
I dare presume he would your Grace should know
Henceforth he'l walk no more *Incognito*.

Above all, Cavendish's philosophy is here considered to shed light on the principles of Aristotle.²⁷ She is praised for seeing past the "cunning" and "subtly" of Scholastic logic with its fraught Latin terminology by exploring Aristotelian principles in discursive English. Even so, while Peripatetic ideas are by no means "incognito" in her works—as

²⁵ For an introduction to speculative natural philosophy, see Wallace, "Traditional Natural Philosophy" (1988). On speculative natural philosophy more generally, see Anstey, "Experimental versus Speculative Natural Philosophy" (2005) and Anstey and Vanzo, "The Origins of Early Modern Experimental Philosophy" (2012). For some important correctives, see Feingold, "'Experimental Philosophy': Invention and Rebirth of a Seventeenth-Century Concept" (2016).

²⁶ See BL, Luttrell Collection of Broad-sides, C.20.3, ff. 105. Having been through Joseph Foster's *The Register of Admissions to Gray's Inn, 1521-1889, together with the Register of Marriages in Gray's Inn Chapel, 1695-1754* (London, 1889), the identity of H.J. remains unclear.

²⁷ Cf. Eileen O'Neill's claims that Cavendish developed a Stoic-inspired piece of anti-Aristotelian natural philosophy: see *Observations*, "Introduction", xxi-xxxv.

the above poem intimates—Cavendish never explicitly identified as an Aristotelian. There are a number of reasons why this is the case, but the uppermost is that there was no sterile set of universally “Aristotelian” positions that she could summon. As Charles Schmitt famously argued, “the single rubric Aristotelianism is not adequate to describe the range of diverse assumptions, attitudes, approaches to knowledge, reliance on authority, utilisation of sources, and methods of analysis to be found among the Renaissance followers of Aristotle”.²⁸ In his pioneering studies, Schmitt established that undergraduates were principally acquainted with Aristotelian-Scholastic physics and metaphysics through Latin commentaries and textbooks, which often deviated from Aristotle’s initial concerns or arguments.²⁹ Advancing upon this work, Richard Serjeantson, Mordechai Feingold, and, most recently, Dmitri Levitin have indicated some ways in which a plurality of “Aristotelianisms” persisted in seventeenth-century England.³⁰ Yet scholars have largely overlooked the transmission of Aristotelian thought outside of the universities, or even in the English vernacular.

In fact, only recently have scholars begun to study the long and distinguished tradition of vernacular humanism.³¹ It is true that humanists sometimes grappled with the

²⁸ Schmitt, *Aristotle and the Renaissance* (1983), 10. More generally, see Lüthy, Leijenhorst, and Thijssen, “The Tradition of Aristotelian Natural Philosophy: Two Theses and Seventeen Answers” (2002).

²⁹ The most thorough catalogue and study of Latin Aristotle commentaries is Charles Lohr’s six-volume work: *Latin Aristotle Commentaries* (1988-2005). Also see Schmitt, “The Rise of the Philosophical Textbook” (1988); Grant, *The Nature of Natural Philosophy in the Late Middle Ages* (2010); Sorabji, *Aristotle Transformed: The Ancient Commentators and their Influence* (2016); and Reif, “The Textbook Tradition in Natural Philosophy, 1600-1650” (1969).

³⁰ See, for example, Serjeantson, “The Soul” (2011); Feingold, “Aristotle and the English Universities in the Seventeenth Century: A Re-evaluation” (1998); and Levitin, *Ancient Wisdom in the Age of the New Science: Histories of Philosophy in England, c. 1640-1700* (2015), especially 230-446.

³¹ Rather than expressing a sociological, anthropological, or even philosophical position, “humanism” will be used throughout this study to signify the *studia humanitatis*. This constituted the study of what we now think of as “arts” subjects—especially language, literature, history, and moral philosophy—with an emphasis on ancient ideas. See Mann, “The Origins of Humanism” (1996). Some useful starting points regarding vernacular humanism are Waswo, “The Rise of the Vernaculars” (1999); *The Vulgar Tongue: Medieval and Postmedieval Vernacularity*, ed. by Somerset and Watson (2003); *Dynamics of Neo-Latin*

minutiae of Greek, Hebrew, and Latin philology. But a consensus emerged over the course of the seventeenth century that if language was to fully satisfy the human need to communicate thoughts, then all languages must be capable of powerful expression and persuasion in the right hands.³² This was particularly appreciated in the courts, where ideas were frequently exchanged among figures who were required to manipulate the English language eloquently when they spoke in Parliament, the Inns of Court, or composed plays for the popular stage.³³ It was largely through courtly conversations that Cavendish fluidly derived and integrated ancient ideas in her early works.³⁴ While she increasingly read and explicitly responded to other authors after the Restoration, Cavendish continued to cultivate a continuum between the spoken word and the printed book. She transferred colloquies to print in various ways, such as integrating dialogues into her *Philosophical Letters* and *Sociable Letters*.³⁵

Even if some attention has now been paid to vernacular humanism, Aristotle's association with the universities continues to provoke the opinion that "the rise of vernacular learning resulted in a radical decline of the relative importance of Aristotle".³⁶ David Lines and Marco Sgarbi have started to study the reception of Aristotle in the Italian vernacular, yet hardly any research has been undertaken on the transmission of

and the Vernacular: *Language and Poetics, Translation and Transfer*, ed. by Deneire (2014); and *A Palace in the Wild: Essays on Vernacular Culture and Humanism in Late-Medieval and Renaissance Scotland*, ed. by Houwen, MacDonald, and Mapstone (2000).

³² Sgarbi, *The Italian Mind: Vernacular Logic in Renaissance Italy (1540-1551)* (2014), especially 10-19.

³³ The best source on the dynamic relationship between the spoken and written word in early modern England is Fox, *Oral and Literate Culture in England, 1500-1700* (2000).

³⁴ On the rhetorical opposition to bookishness in the Cavendish circle, see Condren, "Casuistry to Newcastle: 'The Prince' in the World of the Book" (1993).

³⁵ For the expansiveness of the Cavendish library, see Noel, *Bibliotheca nobilissimi principis Johannis Ducis de Novo-Castro* (London, 1719).

³⁶ Poster, "Whose Aristotle? Which Aristotelianism?: A Historical Prolegomenon to Thomas Farrell's *Norms of Rhetorical Culture*" (2008), 384.

Aristotelian thought in English during the seventeenth century.³⁷ In part, this is because Aristotle's works were less frequently translated into English than was the case with other vernaculars. Besides a number of sixteenth-century translations, it seems that the only texts of Aristotle that were rendered into English during the seventeenth century were his *Rhetoric* (twice) and *Art of Logic* (three times).³⁸ Ann Blair has demonstrated that Aristotle was readily accessible to a courtly audience through vernacular textbooks in other parts of Europe, but there were also fewer of these in England.³⁹ Moving outside the confines of the Scholastic textbooks, however, I show that the very way in which English thinkers were trained to organise knowledge and understand psychological faculties led them to see the world through Aristotelian lenses that manifest themselves in the prose treatises and the prefaces to their own publications.

Rather than seeing the mediation of English conversations and commentaries as hurdles to a full understanding of Aristotle's ideas, we will see that Cavendish considered such diffusion and plurality of interpretations to make up the very fabric of Aristotelian philosophy. As Schmitt suggested, scholars should not only conceive of Aristotle's original Greek texts or their Latin translations as "Aristotelian", but must account for the myriad of transformations that his texts underwent over the course of centuries.⁴⁰

Looking at the methodological preface to the 1653 translation of William Harvey's *De*

³⁷ See Olmos, "Humanist Aristotelianism in the Vernacular: Two Sixteenth-Century Programmes" (2011); Lines, "Rethinking Renaissance Aristotelianism: Bernardo Segni's *Ethica*, the Florentine Academy, and the Vernacular in Sixteenth-Century Italy" (2013); Sgarbi, "Benedetto Varchi on the Soul: Vernacular Aristotelianism between Reason and Faith" (2015); and Bianchi, "Volgarizzare Aristotele: per chi?" (2012). For relevant historiographical points, see Lines, "Beyond Latin in Renaissance Philosophy: A Plea for New Critical Perspectives" (2015).

³⁸ On editions and vernacular translations of Aristotle more generally, some good starting points are Crazz and Schmitt, *A Bibliography of Aristotle Editions, 1501-1600* (1984) and Riley, *Aristotle Texts and Commentaries to 1700 in the University of Pennsylvania Library: A Catalogue* (1961).

³⁹ See Blair, "La persistance du latin comme langue de science à la fin de la Renaissance" (1996).

⁴⁰ For a more theoretical discussion, see Thompson, "Reception Theory and the Interpretation of Historical Meaning" (1993).

generatione animalium succinctly underscores how this can be enacted when studying Cavendish. Even Harvey's chosen title reflects Aristotle's *De generatione et corruptione*, and the preamble is largely a continuation of the Paduan variety of the Aristotelian commentary tradition.⁴¹ Nonetheless, Harvey commences his work by writing that "Aristotle (Natures most diligent searcher) affirms that the *Male* and *Female* are the *principles* of *Generation*, and that *she* contributes the *matter*, and *he* the *form*", before proceeding to state "that these are false, and rash assertions".⁴² Here Harvey praises Aristotle only to challenge the validity of a proposition in his opus before using other ancient philosophical and physiological precepts, many of which he found in the *corpus aristotelicum*, to initiate a "new" explanation for animal generation.⁴³ We will see that Cavendish drew on Harvey's work to develop her outlook on plant and animal life, and, for this reason, it is necessary to look at how Harvey read and interpreted Aristotle to fully appreciate her innovative approaches to these topics. More generally, due to Cavendish's lack of Latin and formal education, the critic must first look at her sources, and, second, at how those assimilated ancient ideas.

As a thesis that explores the centrality of Aristotelian thought to a figure who did not explicitly identify as a follower of Aristotle, Dennis Des Chene's and Cornelis Leijenhorst's ground-breaking studies of how Aristotelian textbooks and commentaries impacted the philosophies of Descartes and Hobbes have been models for this study.⁴⁴

⁴¹ See Randall, *The School of Padua and the Emergence of Modern Science* (1961) and French, *William Harvey's Natural Philosophy* (1994), especially 18-50.

⁴² Harvey, *Anatomical Exercitationes, Concerning the Generation of Living Creatures* (London, 1653), A5r.

⁴³ The classic sources on Aristotle and the preface to *De generatione* are Schmitt, "William Harvey and Renaissance Aristotelianism: A Consideration of the Praefatio to *De generatione animalium* (1651)" (1984); Webster, "Harvey's *De generatione*: Its Origins and Relevance to the Theory of Circulation" (1967); and Wear, "William Harvey and the 'Way of the Anatomists'" (1983).

⁴⁴ Des Chene's studies are *Physiologia: Natural Philosophy in later Aristotelian and Cartesian Thought* (1996); *Life Form: Late Aristotelian Conceptions of the Soul* (2000); and *Spirits and Clocks: Machine and*

Having said that, the trajectory of Cavendish's intellectual development was in many ways opposed to these thinkers. In contrast to more highly educated lawyers, physicians, and divines, during the early modern period "philosophers" were usually those who only possessed an undergraduate degree.⁴⁵ While both Descartes and Hobbes sharpened their teeth on Scholastic Aristotelianism—and were "philosophers" for this reason—they gradually complicated the ideas from their curriculum, openly disparaging Scholastic thought in the process. This is in part because they believed that the best way to disassociate the label of "philosopher" with its implications of being lesser-educated was to diverge notably from the ideas and methods in which they had been trained. Due to the prominent place that historiography has granted the likes of Descartes and Hobbes, their intellectual trajectories have commonly been taken as paradigmatic.

Yet Cavendish's exclusion from the institutions of formal education ironically meant that she was far more disposed to align herself with the universities than many of her undergraduate-educated contemporaries. By mostly reading the vernacular exegeses of learned figures as she sought to harness support from the universities, Cavendish cultivated a more scholarly or even Scholastic understanding of the Aristotelian tradition than is evident in popular publications. It is telling in this regard that her attitude towards the natural world deviated conspicuously from the work by "Aristotle" that was most published in English during the period: the encyclopaedic *Problemata*.⁴⁶ Where the *Problemata* revels in the marvellous and fortuitous—similar to the later natural

Organism in Descartes (2001). Also see Leijenhorst, *The Mechanisation of Aristotelianism: The Late Aristotelian Setting of Thomas Hobbes's Natural Philosophy* (2002). For a useful overview of these historiographical trends, see Edwards, "Aristotelianism, Descartes, and Hobbes" (2007).

⁴⁵ On the natural philosopher, see Serjeantson, "Becoming a Philosopher in Seventeenth-Century Britain" (2013) and the essays in *The Philosopher in Early Modern Europe: The Nature of a Contested Identity*, ed. by Condren, Gaukroger, and Hunter (2006).

⁴⁶ See Blair, "Authorship in the Popular 'Problemata Aristotelis'" (1999) and *Aristotle Problemata in Different Times and Tongues*, ed. by de Leemans and Goyens (2006).

historians—we will see that Cavendish homed in on regular experience and the ordinary course of nature. Indicating the difficulty of even identifying the genitive “Aristotle” with a single individual, Aristotle’s *Problemata* is an assortment of sources from different periods, in which passages from his works are abstracted and yoked with later observations. By reading English commentaries, Cavendish thus generated a more fundamentally Aristotelian apprehension of the natural world than she would have acquired by studying vernacular translations of his work.

By fundamental, it should not be understood that Cavendish’s approach to Aristotle was simplistically “truer” than the perspective that she may have procured from reading the *Problemata*, but rather that she worked with the more basic and institutionally established view that natural philosophy is the search for the necessary and most general causes of natural effects. As opposed to Plato’s belief that individual substances were less real than the abstract and universal “Ideas” in which they participated, Aristotle and his commentators held that substance was the primary constituent of the natural world and consequently the most fundamental cause.⁴⁷ Operating from this orientation, Cavendish dedicated successive volumes to adjusting her substance theory so that it could better account for observable natural phenomena. For all the recent revisionist scholarship, it remains a commonplace that early modern thinkers succeeded from Peripatetic qualities and natures to mathematical and mechanical philosophies.⁴⁸ In more nuanced studies, this has been framed as a steady transition from *minima naturalia* to atomism.⁴⁹ But it has not

⁴⁷ See Mann, *The Discovery of Things: Aristotle’s Categories and their Context* (2000).

⁴⁸ For this commonplace, see Westfall, *The Construction of Modern Science: Mechanism and Mechanics* (1977) and Hall, *The Revolution in Science, 1500-1750* (1983). The essays from *Early Science and Medicine* 2.3 (1997) were seminal to challenging this discourse.

⁴⁹ See Clericuzio, *Elements, Principles and Corpuscles: A Study of Atomism and Chemistry in the Seventeenth Century* (2000), 9-33.

been fully recognised that Cavendish travelled an antithetical trajectory. She moved from proposing a version of the atomic hypothesis, to entertaining the notion that material spirits cause the natural world to function, before finally arriving at a theory of *minima naturalia*, in which various kinds of qualitatively different matter coexist on a material continuum. It was the conviction that mechanical atomism was reductive that led her to produce a theory of material vitalism—which will be shown to have been a defining feature of seventeenth-century Aristotelian thought—to explain animal life and natural abundance. Accepting the Aristotelian stance that only a balance between reason and observation could provide an accurate outlook on the natural world, Cavendish went so far as to ascribe the qualities of rationality and sensitivity to matter itself.

In the process of shaping her substance theory and methodology, Cavendish particularly relied on the historically-informed writing of figures in the Royal College of Physicians. The primary purpose of medicine was to recover human health. Yet, as an amateur natural philosopher rather than a trained physician, Cavendish manipulated medical ideas towards speculative, philosophical ends. In doing so, she developed a substance theory that has marked affinities with that of arguably the most scholarly and institutionally established physician of her day, Francis Glisson. Following from the medical precepts that guided her approach to the history of philosophy, Cavendish in fact considered explicit identification with Aristotle to sit uncomfortably with the Aristotelian and Galenic view that only the intermixture of pre-existing concepts could generate qualitatively new ideas. Over the course of this work, I clearly differentiate her approach to literary and philosophical composition from both Descartes' irreducible originality and

the eclecticism of thinkers such as Gassendi, which was based on the amalgamation of various ideas only to reinforce a pre-established set of principles.

Cavendish also ameliorated and protected natural philosophy by situating it in relation to the higher discipline of theology. Whereas she adapted medical themes towards philosophical ends, Cavendish actively delineated the scope of philosophy so as to situate herself as an Anglican without infringing upon the intellectual territory of divines. We will see that she followed the interpretation of Aristotle's works by scholars such as Meric Casaubon in arguing that physics or natural philosophy is a probable science that analyses natural changes, while metaphysics or theology studies the immutable and immaterial. Other than fleeting references in Katie Whitaker's popular biography, Cavendish's engagement with theologians has been almost completely neglected.⁵⁰ Even in the recent collection of essays on *God and Nature in the Thought of Margaret Cavendish* there is hardly a mention of the scholars or clergymen with whom she interacted.⁵¹ But many of those who held or later took up prestigious places in the universities and the Church joined the Cavendishes in exile during the 1650s; these included Robert Creighton, George Morley, and John Bramhall.⁵² Among such figures, Jasper Mayne—who was the Cavendishes' chaplain before and during the Interregnum, and would later become the canon of Christ Church—was an especially useful Oxford connection for Cavendish.⁵³

⁵⁰ See Whitaker, *Mad Madge: Margaret Cavendish, Duchess of Newcastle, Royalist, Writer, and Romantic* (2003).

⁵¹ See *God and Nature in the Thought of Margaret Cavendish*, ed. by Siegfried and Sarasohn (2014).

⁵² On Creighton, see Macauley, "Robert Creighton", *ODNB*. On Morley and the Royalist exiles, see Bosher, *The Making of the Restoration Settlement: The Influence of the Laudians, 1649-1662* (1951), 32-60 and Hayward, "New Directions in Studies of the Falkland Circle" (1987).

⁵³ On Mayne, see Flynn, "Jasper Mayne", *ODNB*. That Mayne was chaplain to the Cavendishes before the Interregnum has not previously been noted, but see Mayne's letter to William Cavendish from 1639, in which he thanks William for choosing him as chaplain: NUL, MS Pw 1/181.

Through such contacts, Cavendish gained access to illustrious institutional thinkers such as Barlow and William Moore during the 1650s, and continued to foster links with the universities over the course of her career.⁵⁴ Now serving as substantial sources of evidence for the immediate reception of Cavendish's ideas, she sent all of her publications between 1660 and 1666 to most Oxford and Cambridge colleges. With this torrent of gifts, Cavendish inundated these institutions with more books than any seventeenth-century writer and probably anyone since. Cavendish evidently desired to be read not only by courtiers but also the most learned men of her day. At the same time, chapter 4 shows that she was highly critical of the one university man with whom she has frequently been paired, Henry More. Because More postulated the existence of immaterial spirits in the natural world, he posed a threat to the distinction between theology and physics, without which the publication of natural philosophy by laypeople such as Cavendish could become a far more treacherous enterprise. Conversely, even as thinkers in the Royal College of Physicians and the Church inspired her thought, Cavendish recognised that publishing works of natural philosophy could lead doctors and especially divines into professional troubles, and she used this to her advantage.⁵⁵

Focusing each chapter on a single piece in Cavendish's oeuvre, this dissertation underscores the ways in which she engaged with various disciplinary categories. It starts with an exploration of how *Poems, and Fancies* manipulated ancient mythology, and then turns to her appropriation of medical ideas in her slightly later *Philosophicall Fancies* and her 1655 *Philosophical and Physical Opinions*. From there, I grapple with the

⁵⁴ See Tuck, "The Institutional Setting" (2012).

⁵⁵ On professional difficulties for doctors and divines who wrote natural philosophy, see Schmitt, "Aristotle Amongst the Physicians" (1985) and Feingold, "Science as a Calling? The Early Modern Dilemma" (2002).

theology of *Philosophical Letters*, before concluding with a discussion of the mature philosophy of *Observations Upon Experimental Natural Philosophy*, and her satirical critique of the Royal Society in *The Blazing World*. Partly due to her disciplinary and generic range, scholars have frequently alleged that Cavendish was an incoherent thinker.⁵⁶ Countering this discourse, the most recent study of Cavendish's philosophy has opted to look at it analytically, as a relatively stable whole.⁵⁷ Without seeking to iron out every dissonance in her works, most of the supposed contradictions vanish when they are situated within the historical milieu out of which Cavendish's thought evolved. By tracking the modifications that marked Cavendish's consecutive publications, she emerges as a dynamic thinker whose ideas developed in tandem with and sometimes in reaction to the intellectual trends of her day. Along with being organised in terms of works, disciplines, and chronology, each of the four chapters is further split into sections that look specifically at the ways in which Cavendish read and responded to her contemporaries, and how they engaged with her. This thesis is not so much a single author study as a challenge to the very notion that an author can be understood in even relative isolation. Not only reassessing Cavendish's thought, it casts the ideas of many of her now lesser-known peers into sharper relief.

Chapter 1, "Poetry: Early Atomic Speculations", begins by displaying that George Sandys' 1632 translation of and extended commentaries on Ovid's *Metamorphoses* exerted a profound influence on *Poems, and Fancies*. In navigating this encyclopaedic work, Cavendish was guided by Francis Bacon's *De sapientia veterum* of

⁵⁶ On Cavendish's supposed inconsistency, see Clairhout and Jung, "Cavendish's Body of Knowledge" (2011); Holmesland, "Margaret Cavendish's *The Blazing World*: Natural Art and the Body Politic" (1999); and Stevenson, "The Mechanist-Vitalist Soul of Margaret Cavendish" (1996).

⁵⁷ See Cunning, *Cavendish* (2016).

1609 (or at least Arthur Gorges's 1619 translation). She especially appreciated Bacon's belief that mythology can supply vestigial insights into the composition of the unobservable matter that underpins the natural world. The second part of the chapter turns from these more literary sources to Cavendish's assimilation of ideas from the philosophies of Gassendi and Thomas Harriot. During the 1640s and the early 1650s, Gassendi associated with the Cavendishes in Paris, and his atomism was a central topic of deliberation in the Republic of Letters. In composing *Poems, and Fancies*, Cavendish followed Gassendi by attributing vital qualities to her atoms, and dwelling on the power of inference. In contrast to Gassendi, Harriot grappled with the atomic hypothesis in his mathematical manuscripts, which Margaret's brother-in-law, Charles Cavendish, studied extensively. Synthesising these approaches, Margaret produced an atomic philosophy that negotiated between the quantitative and qualitative features of the natural world. She united the literary, historical, and mathematical aspects of atomism.

Chapter 2, "Medicine: The Spirits of Physiology", shows that Cavendish altered her substance theory notably in her slightly later *Philosophicall Fancies*. It was engaging with the medical discourse that inspired Cavendish to reject the atomic hypothesis and to postulate material "spirits" as the primary constituents of the natural world. The first section argues that Descartes' *The Passions of the Soule* alerted Cavendish to the failure of mathematics and mechanical corpuscles to explain the intricacies of animal psychology and physiology. Scholars have often supposed that Descartes' philosophy signalled an irreconcilable break with his predecessors, but the second part of the chapter stresses the vitality of Galenic medicine and the vigour of chymical developments. Pushing back against current scholarly orthodoxy, the case is made that learned and

chymical medicine fruitfully intermixed in the courtly setting, and that Cavendish was attentive to these discourses from an early stage through her interactions with Digby, Charleton, and Théodore de Mayerne. Whereas it has previously been proposed that Charleton influenced Cavendish's atomism, I argue that his translations of Jan Baptiste van Helmont were essential sources for her rehabilitation of a more sensitive outlook on animal life against Descartes' physiology. In conclusion, the chapter explores how and why Nehemiah Grew compiled a compendium to *Philosophical and Physical Opinions*.

Chapter 3, "Theology: Aristotle and Reformed Orthodoxy", demonstrates that Cavendish ceased to discuss "spirits" after the Restoration out of fear that these material principles could be mistaken for Henry More's immaterial "Spirit of Nature". Under the guise of "Cambridge Platonism", historians of literature and philosophy have prioritised the writing of More, Ralph Cudworth, and Joseph Glanvill. While this has given the impression that Cavendish's material vitalism posed a threat to religious orthodoxy, I argue in the first part of the chapter that her substance theory was in fact fully suited to the doctrines of both the Anglican Church and Reformed theology. Far from denying the existence of God, angels, or incorporeal souls, she worked with the Aristotelian distinction between physics and metaphysics to reinforce an autonomous sphere of unchanging perfection as the subject of theology. The second part of the chapter investigates how Cavendish drew on the material vitalism of the medical tradition to argue that the population of the natural world with immaterial spirits would result in the renewal of superstitious polytheism. Not merely the rhetorical pose of a dissembling libertine, I contend that Cavendish's religious orientation anchored her deep-seated belief in the need for social and political stability.

Chapter 4, “History: From Criticism to Satire”, underscores how Cavendish’s desire for social permanence and intellectual continuity led her to challenge the Royal Society’s propagandists and their rhetoric of novelty. The first section of this chapter discusses the manner in which Cavendish manipulated Thomas Stanley’s *History of Philosophy* to develop an historically-informed outlook on experience that she used to critique the notions of observation and memory propagated by prominent figures in the early Royal Society such as Robert Hooke. In confuting Hooke, Cavendish traced the germs of natural philosophy to the Greek poets and their early speculative successors. Prompted by this poetic affinity, the second part of the chapter turns to Cavendish’s satirical *Blazing World*. I reveal that this work inspired Shadwell’s *The Virtuoso*. Yet Shadwell took a more polemical approach to incite laughter in his audiences, whereas Cavendish designed *The Blazing World* to defend traditional institutions of learning and speculative natural philosophy. For this reason, her critique of the Royal Society echoes those composed by eminent institutional figures such as Robert South. Even so, the chapter concludes by suggesting that perhaps the most formidable man at the University of Oxford, John Fell, put Cavendish’s philosophical allegiances and ambitions into question at the very time that she most emphatically supported the universities.

Excluded from the institutions and defying the burgeoning disciplinary taxonomies, Cavendish increasingly found herself between worlds. Throughout her oeuvre, she had developed a continuum between literature as imaginative writing and the *literae humaniores* as an embodiment of the encyclopaedia of learning. Bookended by the influences of Gassendi and Stanley, Cavendish deployed numerous techniques to capture this fluidity: she composed works in both poetry and prose, appended a fictional

piece to her philosophical treatise, and published *Sociable Letters* as a companion to her *Philosophical Letters*. It might be a commonplace that early modern disciplinary boundaries were less finely delineated than modern university faculties, yet scholars have rarely assessed the intersections between realms of learning in practice. Two exceptions are Kristine Haugen's *Richard Bentley: Poetry and Enlightenment* and Lynn Sumida Joy's *Gassendi, the Atomist*, both of which have shaped my own manner of proceeding.⁵⁸ While Haugen has underscored the relationship between university scholarship and courtly literature in her discussion of Bentley, Joy has demonstrated how Gassendi used history in his attempt to incorporate the Epicurean natural philosophy that was *à la mode* in the courts into the universities. But there is still a dearth of research on the rapport between seventeenth-century literature and natural philosophy.

The extant studies of literature and philosophy are usually conducted along the lines of misleading categories such as "the ancients versus the moderns".⁵⁹ Concomitantly, scholars have contemplated the fictional facets of philosophical texts, or the philosophical resonances in works of fiction.⁶⁰ The latter scholarship has much to commend it for complicating C.P. Snow's "two cultures" thesis.⁶¹ The deconstruction of the two cultures is also the goal of the most thorough study of Margaret Cavendish to

⁵⁸ See Joy, *Gassendi, the Atomist: Advocate of History in the Age of Science* (1987) and Haugen, *Richard Bentley*.

⁵⁹ The classic study is Jones, *Ancients and Moderns: A Study of the Rise of the Scientific Movement in Seventeenth-Century England* (1961) and the revisionist account is Levine, *The Battle of the Books: History and Literature in the Augustan Age* (1991).

⁶⁰ See Marchitello, *The Machine in the Text: Science and Literature in the Age of Shakespeare and Galileo* (2011); Ait-Touati, *Fictions of the Cosmos: Science and Literature in the Seventeenth Century* (2011); Campbell, *Wonder & Science: Imagining Worlds in Early Modern Europe* (1999); Edwards, *Milton and the Natural World: Science and Poetry in Paradise Lost*; and Picciotto, "Reforming the Garden: The Experimentalist Eden and *Paradise Lost*" (2005).

⁶¹ See Snow, *The Two Cultures and the Scientific Revolution* (1959). For works that have their explicit goal as deconstructing these two cultures, see Levine, *One Culture: Essays in Science and Literature* (1987); Leavis, *Two Cultures?: The Significance of C.P. Snow* (1962); and *Science and Literature: Bridging the Two Cultures*, ed. by Wilson and Bowen (2001).

date: Lisa Sarasohn's *The Natural Philosophy of Margaret Cavendish: Reason and Fancy During the Scientific Revolution*.⁶² Sarasohn maps Snow's terms onto early modern psychology; she treats fanciful literature as synonymous with fictional or imaginative writing and deploys rational "science" anachronistically to signify the "new philosophy" and especially experimentation. In using such categories, the more discursive mode of speculative or traditional natural philosophy, and its complex relationship with medicine and theology, is inevitably sidelined. Classical scholarship—broadly understood as the translations of and commentaries on ancient and Patristic texts—also falls by the wayside in this model. As we will see, scholarship is the fulcrum at which the higher disciplines, traditional natural philosophy, and even the nascent experimentation intersected. Building on the findings of scholars such as Anthony Grafton, Dmitri Levitin, and Scott Mandelbrote, it is now possible to appreciate that the two cultures were actually three in one.⁶³ Not stagnant distinctions, the fault lines that punctuated disciplinary categories were continually negotiated during the seventeenth century, and Cavendish's notion that natural diversity arises from three distinctive but mutually constitutive substances provides a material correlate for examining the intersections between these early modern intellectual undertakings.

Instead of juxtaposing disciplines, this study looks at the many minor figures that made up the tightly knit fabric of early modern intellectual life, revealing that most learned endeavours of the period occurred on a small scale through gradual shifts and realignments. Cavendish is read alongside other courtly figures, such as Sandys and

⁶² See Sarasohn, *The Natural Philosophy of Margaret Cavendish: Reason and Fancy During the Scientific Revolution* (2010).

⁶³ For a bibliographical essay on these historiographical developments, see Levitin, "From Sacred History to the History of Religion: Paganism, Judaism, and Christianity in European Historiography from Reformation to 'Enlightenment'" (2012).

Stanley, who often published in the vernacular and regarded literary and philosophical studies as concomitant. While these thinkers were her intellectual allies and inspirations, Cavendish's inability to translate classical texts due to her limited Latin and Greek led her to reformulate their ideas when creating her own poetry, plays, and prose treatises. Scholars have sometimes shaped the experimentation of the Royal Society as an engine of equality, yet it was the more traditional and hierarchical sphere of the Republic of Letters that drove one of the first Englishwomen to publish. Engendered in this environment, Cavendish's works are a heady example of the degree to which the seventeenth-century realms of the "new philosophy", literature, and learning were intertwined. There is a tendency even in the acute analyses of Haugen and Lynn to argue that their chosen figures paved the ways for the modern, secular disciplines of "English Literature" or "History". Rather than offering a story of reconciliation, however, this thesis shows that the onset of experimentation meant that disciplinary categories started to separate and coagulate right around the time that Cavendish ceased to publish. Despite her best efforts to curtail this process, we will see that the more diffuse, historical, and discursive form of Aristotelian speculative natural philosophy was largely displaced even during Cavendish's lifetime.⁶⁴

⁶⁴ On related taxonomic issues and a justification for the use of "natural philosophy" rather than the anachronistic "science", see Lüthy, "What to do with Seventeenth-Century Natural Philosophy? A Taxonomic Problem" (2000).

Chapter 1. Poetry: Early Atomic Speculations

When scholars have studied the “new philosophy” and its relationship to seventeenth-century literature and letters, the focus has usually been on an “Epicurean culture” that materialised in the courts as a “modern” counterpoint to the Aristotelian philosophy of the schools.⁶⁵ Because *Poems, and Fancies* is in part a piece of natural philosophy in verse—which grew out of conversations in Paris and Antwerp during the latter half of the 1640s—it has been a touchstone in this discourse. For many scholars, the mere versification of natural philosophy is indicative of a Lucretian influence, and, what is more, thirty pages of Cavendish’s 214-page folio discuss atoms. While she quickly came to reject the atomic hypothesis, the supposed Epicurean-Lucretian atomism of Cavendish’s first publication has guided scholarly outlooks on her philosophical output.⁶⁶ But a strikingly different picture appears when manuscript evidence is adduced to reconstruct the ideas with which she engaged during this early period. Rather than simply (if indirectly) being inspired by *De rerum natura*, this chapter inspects the variety of sources from which the *émigrés* extracted atomic ideas: ancient and modern, mythological and natural philosophical, English and continental European. Whereas

⁶⁵ Some notable examples of this discourse are Mayo, *Epicurus in England: (1650–1725)* (1934); Harrison, “The Ancient Atomists and English Literature of the Seventeenth Century” (1934); Jones, *The Epicurean Tradition* (1989); Barbour, *English Epicures and Stoics* (1998); Kroll, *The Material Word: Literate Culture in the Restoration and Early Eighteenth Century* (1991); Passannante, *The Lucretian Renaissance: Philology and the Afterlife of Tradition* (2011); and Wilson, *Epicureanism at the Origins of Modernity* (2008).

⁶⁶ For an account of debates regarding whether or not Cavendish repudiated atomism, see Detlefsen, “Atomism, Monism, and Causation in the Natural Philosophy of Margaret Cavendish” (2005). For the emphasis on how Cavendish’s atomism inflected her later thought, see Battigelli, *Margaret Cavendish and the Exiles of the Mind* (1998), 39–61; Goldberg, *The Seeds of Things: Theorizing Sexuality and Materiality in Renaissance Representations* (2009), 122–78; Norbrook, “Introduction”, *The Works of Lucy Hutchinson*, xv–cxlvi; Sarasohn, *The Natural Philosophy of Margaret Cavendish*, 34–53; Walters, *Margaret Cavendish: Gender, Science and Politics* (2014), 88–99. Mistakenly considering Cavendish to have been “at the centre of an important intellectual circle in Paris in the 1630s” (Cavendish was seven years old in 1630), she is even referred to in Johnson and Wilson, “Lucretius and the History of Science” (2007), 138.

Cavendish's later volumes emphasise the medical and theological precepts of the schools, *Poems, and Fancies* pulls from works of vernacular humanism to support, promote, and subtly critique developments in the "new philosophy".⁶⁷ Far from wholly supplanting Aristotle, however, we will see that atomic discourses both manipulated and challenged the Aristotelian tradition of *minima naturalia*.⁶⁸ *Poems, and Fancies* is not so much an exercise in Epicurean-Lucretian atomism as an eclectic assimilation of principles from Cavendish's mythological and philosophical readings and conversations.

In an essay "On Translating" in *The World's Olio*, Cavendish writes that it "is not enough for Translatours to be learned in the several Languages; but there must be sympathy between the genius of the Authors, and the Translatours, which every age doth not produce", yet she proceeds to state that in her own age "*Ovid's* genius was matched by *Sans*, and *Dubartus* was matched by *Silvester*".⁶⁹ This passage refers to George Sandys' 1632 translation of and extended commentaries on Ovid's *Metamorphoses* and Joshua Sylvester's 1608 translation of Guillaume de Salluste Du Bartas's *La Sepmaine; ou, Creation du monde*. Cavendish published *The World's Olio* in 1655, but she remarks in the preface that "most of it was written five years since", suggesting that she read Sandys' and Sylvester's editions before composing *Poems, and Fancies*.⁷⁰ Revealing the extent of her admiration for these works, Cavendish repeats in her slightly later *Philosophical and Physical Opinions* that "although *Ovid* and *Dubartus* were so happy as

⁶⁷ The relationship between the new philosophy and humanism (never mind vernacular humanism) has only recently begun to receive due attention: see Grafton, "The New Science and the Traditions of Humanism" (1996); Long, "Humanism and Science" (1988); Copenhaver, "Did Science have a Renaissance?" (1992); Wolfe, *Humanism, Machinery, and Renaissance Literature* (2004); and Levitin, *Ancient Wisdom*, especially 71-83.

⁶⁸ On the complication of the distinction between humanism and Scholasticism, see Rummel, "*Et cum theologo bella poeta gerit*: The Conflict between Humanists and Scholastics Revisited" (1992).

⁶⁹ Cavendish, *The World's Olio* (London, 1655), 12.

⁷⁰ *The World's Olio*, B1v.

to meet a *Sylvester* and a *Sands*, yet very few or no other had the like good fortune in our Language”.⁷¹ Working from these hints, the first half of this chapter shows that Sandys’ *Metamorphoses* was a major “literary” source for conceptualising the atomic discourse in the period prior to the translation of *De rerum natura* into English. In keeping with Cavendish’s cultivation of a continuum between literature and speculative natural philosophy, I argue that she drew on Bacon’s *De sapientia veterum* to orientate her understanding of Sandys’ commentaries. Against the Renaissance Neo-Platonists’ literal reading of myths, Cavendish appreciated that Sandys read fables as allegorical illuminations of natural phenomena. In developing her atomism, she read and adapted concepts from his commentaries in accordance with Bacon’s notion that myths can supply vestigial traces of unobservable substances.

The second part of the chapter turns from Cavendish’s reading of mythology to the philosophical views that she discussed on the continent.⁷² In 1649, Gassendi published his Latin translation of and commentary on Book X of Diogenes Laërtius’s *Lives and Opinions of Eminent Philosophers*; this considers Epicurus. While doing so brought debates surrounding atomism to the forefront of the Republic of Letters, references to “Gassendes” and his publications appear in Charles Cavendish’s correspondences with John Pell as early as 1644.⁷³ In the following year, Margaret was

⁷¹ Cavendish, *The Philosophical and Physical Opinions* (London, 1655), A2r; hereafter *PPO*. On the popularity of Sandys’ translation, see Ogilvie, *Latin and Greek: A History of the Influence of the Classics on English Life from 1600 to 1918* (1964), 12-3.

⁷² On woman and seventeenth-century salons more generally, see Lougee, *Le Paradis des Femmes: Women, Salons, and Social Stratification in Seventeenth-Century France* (1976); Campbell, *Literary Circles and Gender in Early Modern Europe: A Cross-Cultural Approach* (2006), 5-14; and DeJean, “Rooms of their Own: Literary Salons in Seventeenth-Century France” (1999). On the Renaissance household and natural philosophy, see Algazi, “Scholars in Households: Reconfiguring the Learned Habitus, 1400–1600” (2003) and MacDonald, “The Renaissance Household as Centre of Learning” (1995).

⁷³ See Cavendish and Pell, *John Pell (1611-1685) and His Correspondence with Sir Charles Cavendish: The Mental World of an Early Modern Mathematician*, ed. by Malcolm and Stedall (2005), 457, 501, and

married to William and began an educational program under Charles.⁷⁴ From 1651 to 1653, Charles and Margaret returned to England to petition for William's rights to his estates, and she produced her first two publications during this period.⁷⁵ Cavendish makes her profound debt to her brother-in-law plain by dedicating all of the works that she wrote before Charles' death in 1655 to him.⁷⁶ Looking at *Poems, and Fancies*, we will see that Gassendi's ideas were almost certainly one of their central topics of discussion. Significant in this regard are the English translations of fragments from Gassendi's physiology in Charles' hand, now gathered in one of his manuscripts at the British Library.⁷⁷ Since he was a proficient Latinist, it is not inconceivable that Charles rendered these passages in English to facilitate his discussions with Margaret. Yet this chapter also shows that the eclectic nature of Gassendi's atomism—and Cavendish's indirect engagement with it—led her to fuse his views with those of other thinkers. She especially merged Gassendi's more qualitative atomism with the reckonings of the English mathematician, Thomas Harriot. Charles was a highly capable mathematician, and *Poems, and Fancies* is the most mathematically inclined piece in Cavendish's oeuvre. During this crucial stage of Margaret's intellectual development, Charles was conducting an in-depth study of Harriot's manuscripts, and we will see that she was captivated by his reflections on atomism and infinity. Grappling with mythology, natural philosophy, and mathematical concepts, *Poems, and Fancies* is wide-ranging and sometimes fragmentary.

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⁷⁴ On Charles Cavendish, see Jacquot, "Sir Charles Cavendish and his Learned Friends: A Contribution to the History of Scientific Relations between England and the Continent in the Earlier Part of the Seventeenth Century" (1952) and Malcolm, "Biographical Register", *The Correspondence of Thomas Hobbes*, Vol. 2 (1994), 801-5.

⁷⁵ See Whitaker, *Mad Madge*, 137-63.

⁷⁶ See Cavendish, *Poems, and Fancies* (London, 1653), A2r-v; Cavendish, *Philosophicall Fancies* (London, 1653), B4r-5r; and *The World's Olio*. A3r.

⁷⁷ See BL, Harley MS 6083, ff. 106r-v.

But its very breadth makes it an essential starting point for understanding Cavendish's thought and the intellectual atmosphere in which it unfurled.

1.1. The Substance of Myth: George Sandys and Francis Bacon

While much ink has been spilt on the description of atoms that commences *Poems, and Fancies*, it is a later poem titled “a *Dialogue* betwixt the *Poets*, and *Fame*” that intimates a cardinal source for Cavendish's atomic discourse. Rather than Epicurus or Lucretius, it is Pythagoras to whom Cavendish refers multiple times here. She writes that “*Pythagoras* his *Transmigrations* brings / *Ovid*, who seales the Bond with Severall things” and that “*Pythagoras* for *Ovid* first did speake, / And said, his *numbers* smooth, and *words* were sweet”.⁷⁸ Because of figures such as the Italian Platonist, Marsilio Ficino, seventeenth-century thinkers usually situated Pythagoras within a Platonic intellectual genealogy. Frequently lauded as a prophet or religious figure, this tradition stressed Pythagoras's numerological concerns and his ideas on immaterial souls, God, and the heavens.⁷⁹ Yet, by relating Pythagoras to Ovid, Cavendish indicates that she derived her understanding of Pythagoras from his long speech in Book XV of *Metamorphoses*.

In addition to her expressions of admiration for Sandys' translation, Cavendish reveals in numerous places that she was an enthusiastic reader of Ovid. She writes in *Sociable Letters* that she was enamoured of three men as a young woman: “the one was *Caesar*, for his Valour, the second *Ovid*, for his Wit, and the third was our Countryman

⁷⁸ *Poems, and Fancies*, 155-8.

⁷⁹ See Joost-Gaugier, *Pythagoras and Renaissance Europe: Finding Heaven* (2009); Celenza, “Pythagoras in the Renaissance: the Case of Marsilio Ficino” (1999); and Heninger, *Touces of Sweet Harmony: Pythagorean Cosmology and Renaissance Poetics* (1974).

Shakespear, for his Comical and Tragical Humour”.⁸⁰ Cavendish’s esteem for *Metamorphoses* can also be inferred from William Sampson’s dedication of a manuscript poem titled “Loves Metamorphosis: Or: Apollo and Daphne” to the “Learned Ladye her Excellencie Margrett Matchioness of Newe-Castle”.⁸¹ Since Sampson appears to have died in 1655, this poem was in all probability produced before or around the time that Cavendish wrote *Poems, and Fancies*.⁸² Sampson hoped to secure patronage, and would have considered Cavendish’s shared fondness for *Metamorphoses* to make her a suitable dedicatee. Her appreciation of Ovid from an early age should come as no surprise, for *Metamorphoses* (more than *De rerum natura*) was central to the grammar school curriculum and courtly education of the seventeenth-century. Within the English context, students consulted Sandys’ Ovid to assist them with their Latin, and his commentaries were to direct their understanding of the work itself.⁸³ But, unlike many grammar school boys, who only appear to have made it through the first few books of Ovid’s epic, Cavendish was most arrested by Book XV, the very last of *Metamorphoses*.⁸⁴

In part adapting the ideas of Pythagoras to suit his poetry, Ovid’s characterisation of him differed notably from that of his doxographers. Whereas Neo-Platonists used the transmigration of souls to point towards a principle of incorporeal unification, Ovid channelled this notion to underscore how “Hether and thether still the Spirit strays” even after death.⁸⁵ More than immaterial transformations, however, Ovid’s Pythagoras is

⁸⁰ Cavendish, *Sociable Letters* (London, 1664), 338.

⁸¹ See BL, Harley MS 6947, ff. 319r-36r.

⁸² On Sampson, see Kathman, “William Sampson”, *ODNB*.

⁸³ See Blair, “Lectures on Ovid’s *Metamorphoses*: The Class Notes of a 16th-Century Paris Schoolboy” (1989). On the English setting, see Gillespie, *Shakespeare’s Books: A Dictionary of Shakespeare Sources* (2001), 394-400 and Hoole, *A New Discovery of the Old Art of Teaching Schoole* (1969), 161-2.

⁸⁴ On grammar school boys often only reading the first books, see Bate, *Shakespeare and Ovid* (1998), 23 and Clarke, *Classical Education in Britain* (1959), 53.

⁸⁵ Sandys, *Ovid’s Metamorphosis, Englished, Mythologizd, and Represented in Figures* (Oxford, 1632),

concerned with material cycles, such as the changes of season and elemental states.⁸⁶ Engaging with the latter in *Poems, and Fancies*, Cavendish recognises that some of the ancients held that “*foure perfect Elements there bee, / Which do surmount each other by degree. / And some Opinions thinke that One is all, / The rest from that, and to that One shall fall*”.⁸⁷ As Cavendish suggests, Aristotle and many of those who followed him considered four distinct elements to be the most basic concretions of prime matter, while some of the so-called “pre-Socratics” reduced the four elements to one, such as Thales who argued that all elements were derived from water.⁸⁸ Not seeming to fit into either of these categories, Ovid’s Pythagoras explains how “Resolved Earth to Water rarifies; / To Aire extenuated Water rise; / The Aire, when it it selfe againe refines, / To elementall Fire extracted, shines”.⁸⁹ To show that there is not one fundamental element, Pythagoras proceeds to reverse this sequence, concluding that “all though the frame / Be changeable, the substance is the same”.⁹⁰ That is to say, all natural fluctuations come down to a single, non-elemental substance.

Owing to his emphasis on material variation and his non-elemental substance theory, classicists have sometimes labelled Ovid’s Pythagoras a “Lucretian” Pythagoras.⁹¹ Since Ovid declares his admiration for the *De rerum natura* in his *Amores*,

494. See Luchte, *Pythagoras and the Doctrine of Transmigration: Wandering Souls* (2009).

⁸⁶ See Ovid’s *Metamorphosis*, 495-6.

⁸⁷ *Poems, and Fancies*, 31.

⁸⁸ See Gill, *Aristotle on Substance: The Paradox of Unity* (1989), 41-77.

⁸⁹ Ovid’s *Metamorphosis*, 496.

⁹⁰ Ovid’s *Metamorphosis*, 497.

⁹¹ Segal, “Intertextuality and Immortality: Ovid, Pythagoras and Lucretius in *Metamorphoses* 15” (2001). On Lucretius’s influence on Ovid, see Schiesaro, “*Materiam superabat opus*: Lucretius Metamorphosed” (2014); Wheeler, “Ovid’s use of Lucretius in *Metamorphoses* 1.67-8” (1995); Farrell, “The Six Books of Lucretius’ *De rerum natura*: Antecedents and Influence” (2010); Lecocq “De la création du monde: les *De rerum natura* d’Ovide ou Lucrèce métamorphosé” (1999); and Fowler, “From epos to cosmos: Lucretius, Ovid, and the poetics of segmentation” (1995). Sandys was not the only Renaissance reader to note the similarities between Lucretius and Ovid: see Palmer, *Reading Lucretius in the Renaissance* (2014), 54-5.

his connection of Lucretius with Pythagoras may have even been intentional.⁹² Heeding these Lucretian resonances, Sandys repeatedly utilises lines from *De rerum natura* to elucidate Pythagoras's philosophical ideas in his commentaries. Ovid's Pythagoras describes how "winds, in caves impris'ned rave; / Justling the stones, and minerals which have / The seede of fire, inkindled with their rage: / Their furious flames the falling winds assuage".⁹³ Here Pythagoras contends that minerals are partly composed of seeds of fire. Insofar as minerals are in caves and the heat of fire allays the strength of moist air, he maintains that when wind enters a cave it becomes trapped and quickly dissipates. Pythagoras later reiterates that "fire seeds with perfumes, pure wine injects", suggesting that wine is endowed with a poignant smell due to the microparticles that take on its qualities before striking the nose.⁹⁴ In his commentaries, Sandys associates Pythagoras's seeds with the lines from *De rerum natura* VI.861-78 in which Lucretius explains how the water at the "Temple of *Jupiter Hammon*" is ice cold during the day and scalding hot at night. In his translation from Lucretius, this alteration occurs because the "sulphurous seeds of fire" in the earth are drawn out "when the morning sun erects his beames, / And rarefies the earth with peircing gleames".⁹⁵ As these passages indicate, Sandys consistently refers to "seeds" instead of "atoms" in translating and examining the substance theories of Lucretius and Pythagoras.⁹⁶

For all the attention to Epicurean-Lucretian atomism in contemporary scholarship, it is a simple but infrequently noted fact that Lucretius preferred the language of

⁹² Ovid, *Amores*, 1.15.

⁹³ Ovid's *Metamorphosis*, 498.

⁹⁴ Ovid's *Metamorphosis*, 503.

⁹⁵ Ovid's *Metamorphosis*, 516.

⁹⁶ On the tradition of Pythagoras the atomist, see Neumann, "Atome, Sonnenstäubchen, Monaden. Zum Pythagoreismus im 17. und 18. Jahrhundert" (2008).

“*semina*” to “*atomos*” in *De rerum natura*, as Sandys’ marginal citations from the Latin reveal. Sandys’ own use of the term “seeds” probably stemmed from his desire to accurately translate Ovid and passages from Lucretius, rather than from an ideological or even philosophical motivation. Be that as it may, if English natural philosophers had taken up Sandys’ language of “seeds” instead of “atoms”, it would have been trickier for the adversaries of the atomic discourse to characterise it as reductive. “*Semina*” implies that the smallest constituents of the natural world are active principles that stimulate growth and vitality, while “atoms” were increasingly associated with inert matter.⁹⁷ As we will see, it was Gassendi who promoted the discussion of “atoms”, and the gradual association of atoms with inert matter led Cavendish to reject the atomic hypothesis and to draw on the concept of “*semina*” in her subsequent works. In *Poems, and Fancies*, however, Cavendish situates herself in relation to Gassendi. Considering atomic shapes to orientate observable elements, she clarifies in a prose explanation following a poem titled “A World made by foure *Atomes*” that “the foure Principall Figures, as Sharpe, Long, Round, Square, make the foure Elements; not that they are of severall matters, but are all of one matter, onely their severall Figures do give them severall Proprieties”.⁹⁸ In regards to “fire atoms”, for instance, she holds that “The *Sharpest Atomes* do into *Fire* turne, / Which by their peircing quality they burne”.⁹⁹ Cavendish deviated from Sandys’ translation in referring to atoms; however, where we will see that Gassendi deemed “fire atoms” to be round, she followed Sandys in characterising the microparticles that give rise to fire as sharp and piercing. In this sense, Cavendish attributed the qualities of

⁹⁷ The best study of early modern “seeds” is now Hirai, *Le concept de semence dans les théories de la matière à la Renaissance de Marsile Ficin à Pierre Gassendi* (2005), especially see 439-62.

⁹⁸ *Poems, and Fancies*, 31.

⁹⁹ *Poems, and Fancies*, 6.

Sandys' seeds to her atoms.

Sandys also capture the confluence of Lucretius and Pythagoras's ideas when reviewing their opinions on the heavens in his commentary on Book 1. He first translates the line from *De rerum natura* in which Lucretius states that the earth, "this huge masse of mold / Hung in the Ayre; nor earth could earth uphold".¹⁰⁰ Subsequently, he appeals to how Pythagoras related the seven-stringed harp "to the seven Planets: and because the Sunne is placed in the midst as Lord of the rest, whose motions (according to Pythagoras) doe make an incredible harmony, he [Cupid] therefore is said to have invented Musicke. As likewise Physicks".¹⁰¹ Despite occasionally being read as an atomist regarding the astral sphere, Pythagoras held that the heavens are immaterial and that planets move in perfectly uniform circles.¹⁰² Such a position may appear to clash with Lucretius's emphasis on corporeality, yet Sandys quotes from *De rerum natura* to deny the earth a privileged place in the universe. After supplying Pythagoras's mystical and astronomical interpretation of how Cupid invented music, he refers to Lucretius's naturalistic reading of Pan and Syrinx. Lucretius writes that in pursuit of Syrinx—who was transformed into a reed—Pan first blew "on hollow canes, / Then pipes of peeeces framd; whence musicke sprung".¹⁰³ Just as Lucretius saw the world as a "masse of mold", he affiliated the invention of music with a rustic image of shepherds. As these examples indicate, Sandys followed Ovid's juxtaposition and synthesis of seemingly incongruous notions rather than reaching a preferable explanation through rigorous philosophical debate. Drawing on Sandys' layered mythological interpretations, Cavendish writes in *Poems, and Fancies*

¹⁰⁰ Ovid's *Metamorphosis*, 20. See Lucretius, *De rerum natura* II.600-4.

¹⁰¹ Ovid's *Metamorphosis*, 35.

¹⁰² On his belief in the immaterial heavens, see Heninger, *Touches of Sweet Harmony*, 146-200.

¹⁰³ Ovid's *Metamorphosis*, 37-8.

that

Atomes will dance, and measures keep just time;
And one by one will hold round circle line,
Run in and out, as we do dance the *Hay*;
Crossing about, yet keepe just time and way:
While *Motion*, as *Musicke* directs the *Time*:
Thus by consent, they altogether joyne.¹⁰⁴

In representing the musically directed circular motions of atoms, Cavendish was probably assimilating the metaphor of the “cosmic dance” that Pythagoras used to describe planetary motions. On the other hand, by having her atoms dance “the *Hay*”, she manipulates Lucretius’s more naturalistic orientation. While scholars have heard echoes of *De rerum natura* in such passages, they rather attest to a melding of Pythagorean and Lucretian discourses, primarily derived from Sandys’ edition of Ovid.¹⁰⁵

Sandys in fact suggests that many early modern thinkers engaged in a similar fusion of Lucretian and Pythagorean standpoints when developing their astronomical ideas. He notes that Copernicus and his devotees “place the Sunne in the Center” of the universe, “alleadging the Moone to be a heavy body, with risings and depressions, like our vallies and mountaines as since discovered by Galileos Glasses”.¹⁰⁶ Even as Galileo followed Lucretius in questioning heavenly immateriality, Sandys recognised that the modern proponents of heliocentrism situated themselves within the Pythagorean tradition. Cavendish also posed a challenge to geocentrism, arguing that “The *Sun* is of the *sharpest Atomes* made, / Close knit together, and exactly laid. / The *Fabricke* like a *Wheele* is just made round, / And in the midst of all, the *Planets* found”.¹⁰⁷ In this way, she geared the atomic discourse to astronomical ends to argue that the planets revolve

¹⁰⁴ *Poems, and Fancies*, 17.

¹⁰⁵ See Rees, *Margaret Cavendish: Gender, Genre, Exile* (2003), 54-80.

¹⁰⁶ *Ovid’s Metamorphosis*, 20.

¹⁰⁷ *Poems, and Fancies*, 24-5.

because of a continual stream of fire atoms. Reflecting the passage on the temple of Jupiter from Sandys' translation of *De rerum natura*, she also posited fire atoms that run from the sun to the centre of the earth, "There gathering close, and so become a *Sun*" in their own right.¹⁰⁸ It is the constant flow of fire atoms between the centre of the world, the sun, and the planets that keep them on their courses. Based on this poem, the *Oxford English Dictionary* claims that Cavendish is the first to deploy the phrase "The Attraction of the Earth" in the sense of "The phenomenon whereby any object possessing mass attracts another as a result of the action of its gravitation field".¹⁰⁹ But the belief in an affinity between fire atoms—mixed with an Aristotelian understanding of sympathy, as we will see more fully in the next part of this chapter—is a far cry from Newton's abstract notion of gravity, which the *OED* supplies as the next example.

Cavendish may not have pre-empted Newton, but she was conversant with the astronomical ideas of her near contemporaries. In *The World's Olio*, she writes that whereas "*Ptolomy* saith that the Sun moveth and the Earth stands still, *Copernicus* said that the Earth moved and the Sun stood still, & *Tichobrahe* took up the third Opinion, to which could be added no more but that they both moved".¹¹⁰ Cavendish proceeds to express a methodological partiality for Tycho Brahe's synthesis, and *Poems, and Fancies* also suggests that she was a rare individual who inclined towards the Tychonic system.¹¹¹ As Cavendish indicates, Brahe complicated Ptolemaic astronomy by arguing that the five known planets revolve around the sun. Instead of accepting the Copernican hypothesis,

¹⁰⁸ *Poems, and Fancies*, 29.

¹⁰⁹ *OED*, "attraction", n. 4e.

¹¹⁰ *The World's Olio*, 163.

¹¹¹ *Poems, and Fancies*, 24-5. On the slow reception of Copernicus in England, see Russell, "The Copernican System in Great Britain" (1972) and Grant, *In Defense of the Earth's Centrality and Immobility: Scholastic Reaction to Copernicanism in the Seventeenth Century* (1984). On Brahe, see Blair, "Tycho Brahe's Critique of Copernicus and the Copernican System" (1990).

however, he held that the sun and the moon circled the earth. For her part, Cavendish refers to the revolution of the planets around the sun, but she distinguishes the earth from the other planets, even writing at one point that “the *Sun* swiftly the *World* to round”.¹¹² She also writes in “Of the *Motion* of the *Sun*” that the sun “running fast, doth *heat* upon *Earth* cast; / And *Earth* sends *Vapours cold*, to quench his *heate*”.¹¹³

Despite considering the sun to revolve around the earth, Cavendish’s stress on fire in the process of revolution bears a Pythagorean mark. While it is a commonplace that Pythagoras forwarded a theory of heliocentrism, this was in fact based on the exegeses of Copernicus and Kepler. There is some confusion on this point in Sandys’ commentary, for he writes that Pythagoras believed that the “Sunne is placed in the midst” of the planets, yet proceeds to state that Pythagoras discussed the “seven strings, in refference to the seven Planets”. But the seven planets of classical astronomy included the Sun and Moon, along with Mercury, Venus, Mars, Jupiter, and Saturn. As this implies, the Pythagoreans posited a “central fire”, rather than placing the sun at the centre of the universe. Suggesting just how integral the deciphering of ancient texts was to developments in natural philosophy and astronomy, Kepler later construed this fire allegorically as the sun.¹¹⁴ Cavendish objected to the prioritisation of the sun in her discussion of fire, however, by holding that fire at the centre of the earth causes it to turn on its axis and fastens it to the sun. Because “The *Square flat Atomes*, as dull *Earth* appeare”, she simultaneously held that the earth itself was a heavy centre.¹¹⁵ It is accordingly Cavendish’s alignment of atoms and elements that kindled her sympathy

¹¹² *Poems, and Fancies*, A8r.

¹¹³ *Poems, and Fancies*, 36.

¹¹⁴ See Stephenson, *The Music of the Heavens: Kepler’s Harmonic Astronomy* (1994) and Casini, “The Pythagorean Myth: Copernicus to Newton” (1996).

¹¹⁵ *Poems, and Fancies*, 6.

towards the Tychonic system. Far from making the world “modern”, Cavendish’s atomic musings led her to forge affinities between various ancient astronomical perspectives.

As Cavendish’s reading of Sandys’ astronomical discussion indicates, he drew on developments in seventeenth-century natural philosophy to elucidate ancient myths. Previous studies have argued that Bacon was the driving force behind these reflections, fuelled by Sandys’ acknowledgement at the beginning of Book 1 that, out “Of moderne writers”, he has “received the greatest light from Geraldus, Pontanus, Ficinus, Vives, Comes, Scaliger, Sabinus, Pierius, and the *Crowne of the latter*, the Vicount of St. Albons”.¹¹⁶ He thus claimed that the Viscount St. Albans, Francis Bacon, had the widest-reaching impact on his work.¹¹⁷ Sandys’ identification of similarities and differences between ancient and modern ideas on the natural world is broadly in keeping with Bacon’s proposal for an *historia literaria* in his *Advancement of Learning*.¹¹⁸ But given that most of the figures that Sandys lists were chiefly concerned with mythography—as are his commentaries—he probably had Bacon’s *De sapientia veterum* at the forefront of his mind.

Yet, in practice, Sandys diverged notably from Bacon’s mythographic method, as their approaches to the myth of Cupid underscore. In discussing Cupid, Bacon states that “*Love* is the auncientest of all the Gods, and of all thinges else except *Chaos*, which they

¹¹⁶ *Ovid’s Metamorphosis*, 18. See Percy, *The Mediated Muse: English Translations of Ovid, 1560–1700* (1984), 37-70 and Hunter, “The Influence of Francis Bacon on the Commentary of Ovid’s *Metamorphoses* by George Sandys” (1940).

¹¹⁷ Along with the more specific references that follow, some classic works on *De sapientia veterum* are Lemmi, *The Classic Deities in Bacon: A Study of Mythological Symbolism* (1933); Rossi, *Francis Bacon: From Magic to Science* (1968); Anderson, *The Philosophy of Francis Bacon* (1948), 48-69; Vickers, *Francis Bacon and Renaissance Prose* (1968), 141-201; and Jardine, *Francis Bacon: Discovery and the Art of Discourse* (1974), 169-93. The most important study is now Lewis, “Francis Bacon, Allegory and the Uses of Myth” (2010).

¹¹⁸ On Bacon and the *historia literaria*, see Ligota and Quantin, “Introduction”, *History of Scholarship* (2006), 17-22.

hold to bee a contemporary with it”.¹¹⁹ For his part, Sandys writes that the earth was formed out of what the “Platonists call the undigested World, as the world the digested *Chaos*: ordered, as they say by *Love*; who raised the heavy, illuminated the obscure, quickened the dead, gave forme to the deformed, and perfection to the imperfect”.¹²⁰ While Sandys and Bacon follow a long line of Renaissance allegoresis in holding that Love created the world out of chaos, Bacon proceeds to argue that Love portrays “the appetite or desire of the first matter, or (to speake more plaine) the naturall motion of the *Atome*, which is that auncient and onely power that formes and fashions all thinges out of Matter”.¹²¹ Instead of following Bacon’s identification of Love with a material principle, Sandys reverts to the long-standing notion that Cupid is “called a boy, by reason of the diversity of affections which raigne in Lovers”, and that a “Bow and arrowes are given to Cupid; in that beauty wounds afarre off”.¹²² Sandys begins to complicate the tradition of Renaissance Neo-Platonism by de-emphasising the immaterial aspects of Pythagoras’s thought and by mapping myths onto the natural philosophy of his coevals. But his interpretation of Cupid already suggests that he harboured many conceits of “*Ficinus*, *Vives*, [and] *Comes*”.¹²³

Since Cavendish rarely supplies citations in her early works, the degree to which she was acquainted with Bacon’s opus cannot be said for certain. Yet Bacon was closely connected to Hobbes and the Cavendish family. As is well known, Hobbes was Bacon’s amanuensis, and William Cavendish, the second Earl of Devonshire, imitated and

¹¹⁹ Bacon, *The Wisdome of the Ancients*, trans. by Gorges (London, 1622), 77. Since we do not know which edition Sandys or Cavendish consulted, the more complete 1622 edition is referenced throughout.

¹²⁰ *Ovid’s Metamorphosis*, 19-20.

¹²¹ *Wisdome of the Ancients*, 78. On “Love” and “Strife” as cosmological forces in Renaissance allegoresis, see Wolfe, *Homer and the Question of Strife from Erasmus to Hobbes* (2015), especially 3-56.

¹²² *Ovid’s Metamorphosis*, 34-5.

¹²³ See Lyne, *Ovid’s Changing Worlds: English Metamorphoses, 1567-1632* (2001), 198-258.

translated Bacon's literary output into Italian, playing a crucial role in their popularisation on the continent.¹²⁴ In *Sociable Letters*, there is also a hint that Cavendish was conversant with *The Wisedome of the Ancients*.¹²⁵ Despite being published years after *Poems, and Fancies*, the discussions that occurred on the continent during the late 1640s served as fodder for the reflections and quasi-fictional dialogues in this publication.¹²⁶ Praising Bacon perhaps more highly than any other early modern writers, Cavendish lauds him as "Learned, Eloquent, Witty, and Wise, fit for State-Counsel and Advice, to Plead Causes, Decide Controversies, and the like". Proceeding to supply her "Opinion of the Lord Bs. [Bacon's] Works", she points out that his

Writings have been very Propagating and Manuring other mens Brains; the truth is, his Works have proved like as some sorts of Meats, which through Time, or mixture of some Flatuous, or Humid Substance, Corrupt, and Breed Magots or Worms; so his Writings have produced several other Books. The same have *Homer's* Works, although they were of another Sort than his. But you may say, I write more of the Transmigration than of the first Formation or Principle, more of the Effects than the Cause.¹²⁷

Here Cavendish plays on Bacon's professional roles as Lord Chancellor and Attorney General to convey her realisation that other thinkers fastened to his authority in shaping their own philosophical and mythological claims. She proceeds to metaphorically conjure "spontaneous generation" and "transmigration"—both effects far removed from their causes—to capture the respective shifts in interpretation that the works of Bacon and

¹²⁴ See Bunce, "Thomas Hobbes' relationship with Francis Bacon – an introduction" (2003). On *De sapientia veterum* more specifically, see Malcolm, *De Dominis, 1560-1642: Venetian, Anglican, Ecumenist, and Relapsed Heretic* (1984), 47-54 and *The Correspondence of Thomas Hobbes*, 193-7, 207-8, and 676-80. Right around the time *Poems, and Fancies* was published, Hobbes translated William Cavendish's letters to Fulgenzio Micanzio, which contain frequent discussion of Bacon, to English: see *Fulgenzio Micanzio, Lettere a William Cavendish (1615-1628), nella versione inglese di Thomas Hobbes*, ed. by De Mas and Ferrini (1987).

¹²⁵ While not discussing Bacon's earlier "literary" influence, Eileen O'Neill notes some continuities between Bacon's philosophical publications and Cavendish's later work in "Introduction", *Observations*, xiii-xiv.

¹²⁶ See Fitzmaurice, "Margaret Cavendish in Antwerp: The Actual and the Imaginary".

¹²⁷ *Sociable Letters*, 146.

Homer have undergone. Whereas spontaneous generation implies that Bacon's writing has been manipulated to heighten their material but preternatural facets, transmigration suggests that Homer's poetry has taken on an autonomous, immaterial life. The main exegetical issue that Cavendish held to have sullied Homer's poetry is that—not unlike Pythagoras—Neo-Platonists had turned him into a quasi-religious sage-poet.¹²⁸ To make matters worse, *De sapientia* was treated as an ancillary to this reading.

From her earliest publications, Cavendish reiterated that faulty translations and interpretations had sullied Homer's texts. After expressing admiration for Sandys, she wrote in *The World's Olio* that "*Homer is not yet matched in our Language; for though the worke was indeavoured to be translated, yet it is not like him*".¹²⁹ Her chief target in such passages is George Chapman's popular translations of the *Odyssey* and *Iliad*. In the poem that we looked at earlier, after Aeneas and Pythagoras supply short elegies for Vigil and Ovid, Ulysses presents a 64-line panegyric on how "*Homers lofty Verse doth reach the Heavens high*". Both playing with the notion that Ulysses was a skilled orator and displaying her knowledge of the Platonic love poetry that was of cultural currency in Henrietta Maria's court, Cavendish has Ulysses enact the poetic fervour of the mystical, Platonic poet.¹³⁰ Ulysses praises Homer for revealing how "*Soules do mixe of Platonick Lovers*" and concludes his speech by informing Fame that only by naming Homer as her

¹²⁸ On this tradition, see Lamberton, *Homer the Theologian: Neoplatonist Allegorical Reading and the Growth of the Epic Tradition* (1986) and Droge, *Homer or Moses?: Early Christian Interpretations of the History of Culture* (1989).

¹²⁹ *The World's Olio*, 12. That this was a more common sentiment among courtly circles is suggested by a poem at Nottingham University Library "On a wretched Translation of Homer" (Pw V 887).

¹³⁰ On William Cavendish's early Platonic love poetry for Cavendish, see *The Phanseys of William Cavendish, Marquis of Newcastle, Addressed to Margaret Lucas, and her Letters in Reply*, ed. by Grant (1956). On Cavendish and Platonism, see Rees, "Heavens Library and Natures Pictures: Platonic Paradigms and Trial by Genre" (1997) and Starr, "Cavendish, Aesthetics, and the Anti-Platonic Line" (2006).

chief poet would she be consummated “a *Goddess* that’s divine”.¹³¹ Cavendish superimposes her voice on Fame’s when she says to Ulysses that “*I*, at your word, will *Homer* take”, but cautions him that “if he proves not good, be you to blame”.¹³² The full title of this poem is “*The Purchase of Poets, or a Dialogue betwixt the Poets, and Fame, and Homers Marriage*”. By framing her ironic reflections on Chapman’s Homer as a half-hearted “marriage”, Cavendish not only critiques his translation. She also implicitly responds to his 1595 *Ovids Banquet of Sense*, in which Ovid is flippantly extolled as a counter-Plato, enslaved to bodily pleasure.¹³³ Overstating the immaterial aspects of Homer’s epics, Cavendish uses her acerbic wit to transmute the materiality of Chapman’s Ovidian banquet of gluttony into a mystical Homeric wedlock of incompatible souls.

Cavendish’s critique of Chapman’s interpretation and translation of Homer implicitly engages in a wider scholarly debate regarding mythography, since Ficino provided a *raison d’être* for Chapman’s translations of Homer.¹³⁴ Heavily indebted to Socrates’ discussion in the *Apology* and the *Ion*, Ficino argued that successful poetry sprung from a *furor poeticus*, or a heavenly madness that enabled poets to write on topics far beyond their experience.¹³⁵ Inserting Homer in this tradition, Chapman prefaced his 1614 translation of the *Odyssey* by dubbing Homer “the most wise and most divine poet”,

¹³¹ *Poems, and Fancies*, 56-7.

¹³² *Poems, and Fancies*, 57.

¹³³ While Cavendish seems to interpret Chapman as ironic, this has been a point of scholarly contention: see Kermode, “The Banquet of Sense” (1961); Waddington, “Chapman and Persius: The Epigraph to *Ovids Banquet of Sense*” (1968); and Myers, “‘This Curious Frame’: Champan’s ‘Ovid’s Banquet of Sense’” (1968).

¹³⁴ See Clucas, “‘To Rauish and Refine An Earthly Soule’: Ficino and the Poetry of George Chapman” (2002); Jacquot, *George Chapman (1559-1634): sa vie, sa poésie, son théâtre, sa pensée* (1951), 199-254; and Wilcox, “Ficino’s Commentary on Plato’s *Ion* and Chapman’s Inspired Poet in the *Odyssey*” (1985).

¹³⁵ See Plato, *Apology*, 22b-c and *Ion*, 533e-535a. On Chapman’s acceptance of this view, see Schoell, *Études sur l’humanisme continental en Angleterre à la fin de la Renaissance* (1926), 1-20.

and even recounted a visit from the spirit of Homer in his 1609 *Euthymiae Raptus*.¹³⁶ Along with considering Homer's poetry to be the result of a *furor poeticus*, Chapman held that the reader could only uncover the subtle ironies and mysteries of his epic by taking on an aspect of this poetic fury themselves.¹³⁷ Though Chapman claims to have done just this, Cavendish did not believe that he captured the "spirit" of his epics through a faithful translation. Despite lacking Greek, she would have been informed through her conversations on the continent that Chapman not only produced a loose translation of Homer's epics, but that his verbosity and sporadic episodes of ecstasy were also at odds with the ease and restraint of the original.¹³⁸ According to Cavendish, Chapman's translation was guided by his philosophical and theological presuppositions, rather than Homer's Greek.

In coupling Bacon and Homer as misinterpreted writers, Cavendish may have been thinking of Chapman's dedication "To the Most Noble Combiner of Learning, and Honour: Sr. Francis Bacon" in his 1618 translation of Hesiod's *Georgics*. Here Chapman declares that his "Translation of *Homer*" has "received right cheerfull countenance and approbation from your Lordships most grave and honoured predecessor", or *De sapientia*.¹³⁹ For all Chapman's praise, however, Bacon deviated notably from his Renaissance and Platonic predecessors such as Ficino and Comes.¹⁴⁰ He states in the preamble to *De sapientia* that "many of these Fables seeme not to be invented of those by

¹³⁶ Chapman, *Chapman's Homer: The Odyssey*, ed. by Nicoll (2000), 6 and *Euthymiae raptus; or the teares of peace* (London, 1609), B2v-r.

¹³⁷ See *Homer and the Question of Strife*, especially 266-79.

¹³⁸ See Underwood, *English Translators of Homer: From George Chapman to Christopher Logue* (1998), 24.

¹³⁹ See Chapman, *The Georgicks of Hesiod* (London, 1618), A2r-3r.

¹⁴⁰ See Garner, "Francis Bacon, Natalis Comes and the Mythological Tradition" (1970).

whom they are related and celebrated, as by Homer, Hesiod, and others”.¹⁴¹ While this may initially suggest that a *furor poeticus* overtook Homer during composition, Bacon proceeds to clarify that these allegories are “not to be accounted either the effects of the times or inventions of the Poets, but as sacret reliques or abstracted ayres of better times, which by tradition from more ancient Nations fell into the Trumpets and the Flutes of the Graecians”.¹⁴² Bacon accordingly held that the allegories were of a bygone age, now shrouded in darkness save the account laid out in Genesis. Homer’s ignorance towards the more pregnant meaning of the fables was due to the time that had elapsed between their initial formulation and his later conservation of the surviving fragments in his epic tales, rather than divine inspiration.¹⁴³

Sandys does not appear to have been a proponent of *furor poeticus*, and Cavendish appreciated his translation and interpretation of *Metamorphoses* in part because he was attuned to the Lucretian features of Pythagorean natural philosophy. Yet his commentaries do stress particular phenomena and preternatural creatures, without developing a methodological rationale that would allow the reader to gain a deeper understanding of the myths and their relationship to the natural world. In doing so, Sandys was working from the orientation of the medieval encyclopaedists, inspired as they were by Pliny’s *Natural History*, the Aristotelian *Problemata*, and the emphasis on the power of individuals to provide knowledge of universals and ultimately the divine in the tradition of Renaissance Neo-Platonism.¹⁴⁴ Recounting how the Arcadians would

¹⁴¹ *Wisdome of the Ancients*, A8r.

¹⁴² *Wisdome of the Ancients*, A8v-9r.

¹⁴³ See Lewis, “Francis Bacon, Allegory and the Uses of Myth” and A-M. Hartmann, “Light from Darkness: The Relationship between Francis Bacon’s *Prima Philosophia* and His Concept of the Greek Fable” (2011).

¹⁴⁴ On the Italian context, see Findlen, *Possessing Nature: Museums, Collecting, and Scientific Culture in Early Modern Italy* (1994). More generally, see Daston and Park, *Wonders and the Order of Nature* (1998).

choose a man to transform into a wolf, Sandys quotes Pliny as saying that it is wonderful “to consider how farre the Graecian credulity will extend”. Instead of pointing out that Pliny affirmed his fair share of improbable wonders, however, Sandys proceeds to hazard that Pliny would “retract his censure, were he now alive, and saw what is so ordinarily said to be practised by the witches of *Germany*, who take and forsake the shapes of wolves at their pleasure”.¹⁴⁵ Since it is predicated on the obfuscation of the literal and allegorical, Sandys’ focus on Plinian wonders is related to his reading of mythology. When commenting on the battle of the gods and giants in Book 1, for instance, Sandys states that, “as the former Ages have produced some of a prodigious Height, so also have the latter, *Scaliger* saw a man at *Millan*, who hardly could lie on two beds, one set at the foot of another: and *Goropeus*, a Woman in the *Netherlands*, who exceeded ten feet”.¹⁴⁶ In tension with Bacon’s endeavour to unearth lost knowledge through allegoresis, Sandys’ explanations of fables in his commentaries regularly amount to using modern examples to substantiate the existence of phenomenal beings.

In contrast to Sandys, Cavendish followed Bacon’s allegorical readings of the preternatural creatures in ancient myths. In an epistolary exchange with Joseph Glanvill that we will look at more thoroughly in 3.1, Cavendish regarded the notion that witches could “change themselves into severall formes, and then to returne into their first forme againe” to be “altogether against nature”.¹⁴⁷ Despite her appreciation of Sandys’ translation, many of Cavendish’s poems are subtle (and flippant) critiques of his claim to

¹⁴⁵ *Ovid’s Metamorphosis*, 30. On Plinian natural history, see French and Greenaway, *Science in the Early Roman Empire: Pliny the Elder, His Sources and Influence* (1986) and Beagon, *Roman Nature: The Thought of Pliny the Elder* (1992).

¹⁴⁶ *Ovid’s Metamorphosis*, 27.

¹⁴⁷ *Poems, and Fancies*, A2r. See Broad, “Margaret Cavendish and Joseph Glanvill: Science, Religion, and Witchcraft” (2007).

follow Bacon. In a poem on the “Witches of Lapland”, she writes that “*Lapland* is the place from whence all *Winds* come, / From *Witches*, not from *Caves*, as doe think some”.¹⁴⁸ Rather than defending the existence of witches, Cavendish points to a discord between Sandys’ Pythagorean explanation for how “seeds of fire” calm the winds in caves and his belief in witches. Making her engagement with Sandys more tangible, she proceeds to discuss the production of winds in a poem on “The *Windy Gyants*”. Here she writes that “The *four* chiefe *Winds* are *Gyants*, long in length, / As broad are set, and wondrous great in strength”. She then maps her description of the giants onto the diverse motions of winds that arise from the mixture of her four atoms.¹⁴⁹ Since Cavendish’s allegorical account of the giants echoes her earlier atomic explanations of winds in poems such as “Winds are Made in the Aire, not in the Earth”, “Thunder is a Wind in the middle Region”, and “Of cold *Winds*”, she points to a continuum between mythological and natural philosophical analogies.¹⁵⁰ Using the faculty of wit to make connections and judgment to forge distinctions, Cavendish deploys allegories not least because they are effective representational tools that do not indicate identity or equivalence.¹⁵¹ In this way, Cavendish endeavoured to shape fictional conceits that were free of philosophical inaccuracies.

Mythography was typically treated as an explanatory tool in works of prose such as Bacon’s *De sapientia* and Sandys’ commentaries. Yet Cavendish endeavoured to demonstrate in *Poems, and Fancies* that fables could be shaped to hint at how they rationally explain natural causes. In keeping with this aim, Cavendish commences many

¹⁴⁸ *Poems, and Fancies*, 157.

¹⁴⁹ *Poems, and Fancies*, 155.

¹⁵⁰ *Poems, and Fancies*, 33-5.

¹⁵¹ For a relevant discussion, see Vickers, “Analogy versus Identity: The Rejection of Occult Symbolism, 1580-1680” (1984).

of her poems by announcing that they will supply “the reason” why a given natural phenomenon occurs, even when she proceeds to appeal to mythological stories and characters. Inverting Sandys’ use of philosophical material to situate and elucidate allegories in the commentaries to his translation, Cavendish absorbed ideas from the history of philosophy as they were expounded in encyclopaedic commentaries to form allegorical images that abet the mind in apprehending how the natural world functions. Despite this, Walter Charleton (whom we will look at more fully in the next chapter) wrote to Cavendish in 1667 that her poetry

verified the doctrine of Plato, in which Dialogue intituled Io, y^t Poesy is not a faculty or habit proceeding from judgement, or acquired by industry & labour; but a certain Divine Fury, or Enthusiasm, w^{ch} scorning the controll of reason, transports that spirits in raptures, as Jove’s Eagle did Ganymed, or as Witches are said to be wafted on the wings of their Familiars.¹⁵²

Along with contradicting Cavendish’s critique of Chapman’s Homer and her opposition to witchcraft, Charleton gainsays her statement in *The World’s Olio* that “a good Poet hath distinguishment which is judgement, as well as similising, which is fancy; I mean, not those Poets which can only rime, but those Poets which can reason”.¹⁵³ Far from being the outcome of divine fury, Cavendish followed Bacon in holding that judgment should guide both the interpretation and composition of fables.

While Sandys’ comprehensive collection of opinions from ancient, medieval, and modern thinkers act as raw material for Cavendish to manipulate in forming her own substance theory, Bacon provides her with a method for moulding this material to

¹⁵² See Bod., MS Smith 13, ff. 51v-52r. Much of the manuscript copy of this letter is reprinted in *Letters and Poems*, 108-19. On Charleton’s continued interest in this Platonic discourse, see *Socrates Triumphans, or Plato’s Apology for Socrates; and his Phaedo or Dialogue of the Immortality of man’s Soul* (London, 1675). While the work was published anonymously, Charleton makes his authorship clear both in the post-script to his *Three Anatomical Lectures* (London, 1683), P3r-4v and his library catalogue: see MS Smith 13, ff. 146v-7r.

¹⁵³ *The World’s Olio*, 8.

elucidate natural causes. As he discloses in “Proteus, or Matter”, Bacon believed that anyone who desired to gain natural knowledge must grasp “the propertie and proceedings of Matter, should comprehend in his understanding the sum of al things, which have been, which are, or which shall bee, although no knowledge can extend so farre as to singular and individual beings”.¹⁵⁴ When interpreted in relation to the natural world, Bacon did not consider mythography to present an alternative path to insights that could be reached through systematic observation. Nor did it supply the divinely attuned reader with the transcendent knowledge after which Renaissance Neo-Platonists sought. Rather, properly deciphered, myths supply traces of the unobservable but fundamental constituents of the natural world. For this reason, Bacon’s exegeses frequently direct him to material substratums: whether in “Pan, or Nature”, “Coelum, or Beginnings”, “Proteus, or Matter”, “Cupid, or an Atom”, or “Proserpine, or Spirit”. Implied by the fact that some of these substance theories are incompatible and Bacon definitely did not embrace all of them concurrently, his interpretations are only ever of heuristic value.¹⁵⁵ Whereas we have seen that the Platonic emphasis on reading fables with an eye to the material existence of preternatural beings is supposed to establish the ubiquity of a divine presence in the natural world, the abstraction that occurs in the process of Bacon’s allegoresis ironically gestures towards universal substances. Instead of framing Bacon as the father of experimentation or fact collection, Cavendish was inspired by his stress on the primary components of the natural world about which the acute reader can procure preliminary insights through the exposition of myths.

¹⁵⁴ *Wisedome of the Ancients*, 70.

¹⁵⁵ See Rees, “Atomism and ‘Subtlety’ in Francis Bacon’s Philosophy” (1980) and Barbour, “Bacon, Atomism, and Imposture: The True and the Useful in History, Myth, and Theory” (2005). Cf. Manzo, “Francis Bacon and Atomism: A Reappraisal” (2001).

When scholars have taken any notice of the latter part of *Poems, and Fancies*, they have usually seen it as detached from the discussion of atomism. But in starting *Poems, and Fancies* by representing atoms—before constructing allegories, analogies, and vignettes of the observable world—Cavendish hoped that her reader would keep in mind the material base that sustained many of these subsequent descriptions. In forming allegories that bear the imprint of their substance, Cavendish takes on board an insight that Bacon arrived at through his interpretations of myths. She inverts his process of composition, however, by investigating what it would be like to compose fables that accord with a particular pre-established material substratum. For instance, she concludes her poem on Echo and Narcissus with the statement that “One strikes the *Eare*, *Shadow* the *Eye* presents”.¹⁵⁶ Earlier in *Poems, and Fancies*, she had written that “*Atomes hollow* which are *Long*, and *Round*, / When *they* do strike, do make the greatest *sound*”.¹⁵⁷ While she does not mention atoms, her rendering of the myth suggests that echo can be “loud, and cleere, / Whose voice is heard, but no *Body* appeare” due to the manner in which round and hollow atoms can reverberate, being structured like a cavern.

More than acoustics, optics was a subject of assiduous study among Cavendish’s circles. Hobbes engaged in a lengthy correspondence on optics with William, who requested that he translate his optical treatise into English in 1645, and the famous *Short Tract on First Principles* once attributed to Hobbes but probably composed by Robert Payne exists among Charles Cavendish’s manuscripts.¹⁵⁸ While the nuances of this discourse cannot be fully accounted for here, it should be noted that atomistic theories of

¹⁵⁶ *Poems, and Fancies*, 38.

¹⁵⁷ *Poems, and Fancies*, 28.

¹⁵⁸ See Malcolm, “Hobbes, the Latin Optical Manuscript, and the Parisian Scribe” (2005). On Payne as the author of the *Short Tract*, see Malcolm, *Aspects of Hobbes*, 80-145 and Raylor, “The Date and Script of Hobbes’s Latin Optical Manuscripts” (2005).

emission played a key role in these discussions, and out of Kepler's work there emerged the consensus that light did not exist without an individual observer.¹⁵⁹ The likes of Gassendi and Hobbes maintained that light was a fancy or image conceived in the brain, rather than an inherent trait of luminous objects. Recognising and affirming the notion that the brain is required for the production of light, Cavendish writes in "Of Light, and Sight" that "*Philosophers*, which thought to reason well, / Say, *Light*, and *Colour*, in the *Braine* do dwell".¹⁶⁰ She proceeds to state that because of this "poore *Donne* was out, when he did say, / If all the *World* were blind, 'twould still be day". Cavendish here marks her engagement with Donne, who was almost certainly another inspiration behind her transference of natural philosophy in verse from its ancient grounding in the epic to the lyric.¹⁶¹ It is significant, however, that Cavendish refutes a passage in Donne when poetically engaging with Keplerian optical ideas.¹⁶² As Cavendish would have realised, Donne was profoundly interested in astronomical and optical innovations, and he even went out of his way to visit Kepler in Linz during a trip to the continent in 1619.¹⁶³ By refuting a poet whom she believed to have disregarded his philosophical expertise for the sake of a poetic conceit, she accordingly establishes her conviction that poetry is not simply the result of an unencumbered fancy, but should rather conform to the best philosophical theories of the day. In keeping with this view, Cavendish uses an atomic

¹⁵⁹ See Guidice, "The Most Curious of Sciences: Hobbes's Optics" (2016).

¹⁶⁰ *Poems, and Fancies*, 39.

¹⁶¹ On the Cavendishes' Donne manuscripts, see Kelliher, "Donne, Jonson, Richard Andrews and the Newcastle Manuscript" (1993). For a discussion of Cavendish and Donne more generally, see Dodds, *The Literary Invention of Margaret Cavendish* (2013), 57-93.

¹⁶² Cavendish is almost certainly referring to "Come, Fates; I feare you not", in which it is written that the "Sunne would shine, though all the world were blind". While the poem was attributed to Donne in the Old Editions (1613-1669) and in the principle MS. Collections—one of which Cavendish would have read—its author was probably John Roe (see *The Poems of John Donne, Vol. 1*, ed. by Grierson, 407-10).

¹⁶³ See Applebaum, "Donne's Meeting with Kepler: A Previously Unknown Episode" (1971); Bernstein, "Heaven's Net: The Meeting of John Donne and Johannes Kepler" (1997); Hassel, "Donne's *Ignatius his Conclave* and the New Astronomy" (1971); and Jürgen, *Astronomie und Anthropozentrik: Die Copernicanische Wende Bei John Donne, John Milton und den Cambridge Platonists* (1986), 194-216.

theory of optics to construct her myth of Narcissus by writing that “*A Shadow* fell in love with the bright *Light*, / Which makes her walke perpetually in her sight”. Here she frames the myth of Narcissus to show that his obsession with his own reflection signals the constant conjunction or “love” between light and shadow. It was believed that the commingling of light and shadows yielded reflections, and Cavendish indicates that both of these are figments of the imagination that exist in relation to the spectator’s eye.

Cavendish briefly makes her atomic trace palpable in a poem titled “Of a *Garden*” in the latter half of *Poems, and Fancies*, in which she writes: “Here *Atomes* small on *Sun-beames* dance all day, / While *Zephyrus* sweet doth on the aire play: / Which *Musick* from *Apollo* beares the praise, / And *Orpheus* at the sound his Harp downe layes”.¹⁶⁴ In this passage, she again associates light with atoms to intimate that they were more sensible during a period closer to prelapsarian perfection because of the superior power of observation that had faded over time.¹⁶⁵ Yet, embedding atoms and figures from pagan mythology in her Edenic poem, Cavendish proceeds to discuss “*Censuring Satyrs*” and gardeners who have “*Nymphs*, as Hand-maids”.¹⁶⁶ In doing so, she implicitly reduces the Renaissance Neo-Platonist’s notion of *prisca sapientia* to absurdity.¹⁶⁷ Her presentation of atoms dancing alongside Zephyrus or Orpheus—presumably the quasi-mythological composers of those “sacred reliques or abstracted ayres” that reached Homer in fragments—suggests that Cavendish was even more incredulous towards the belief that

¹⁶⁴ *Poems, and Fancies*, 158.

¹⁶⁵ On the evocation of Eden with references to gardens, see Mandelbrote and Bennett, *The Garden, the Ark, the Tower, the Temple: Biblical Metaphors of Knowledge in Early Modern Europe* (1998). Also see Picciotto, *Labors of Innocence in Early Modern England* (2010), 188-254.

¹⁶⁶ *Poems, and Fancies*, 159.

¹⁶⁷ On *prisca sapientia*, see Mulsow, “Ambiguities in *Prisca Sapientia* in Late Renaissance Humanism” (2004) and Walker, *The Ancient Theology: Studies in Christian Platonism from the Fifteenth to the Eighteenth Century* (1972). For the wider context, see Ferguson, *Utter Antiquity: Perceptions of Prehistory in Renaissance England* (1993).

ancient myths were enigmatic expressions of philosophical material than Bacon.¹⁶⁸ By starting her volume by discussing atoms, she also indicates that her substance theory did not result from the interpretation of fables but rather functioned as a tool to unroll assorted allegories and natural images. All the same, while she does not always appeal to *De sapientia*, she continued to use Bacon's exposition of myths as a touchstone for the substance theories of her subsequent publications. Not simply a fountain for poetic imagery, both the mythological material of Sandys' Ovid and Bacon's interpretations operated as springboards for her evolving natural philosophy.

1.2. Adapting the Ancients: Pierre Gassendi and Thomas Harriot

To recognise why Cavendish chose to work with the atomic hypothesis in *Poems, and Fancies* rather than one of the other substance theories divulged in *De sapientia*, we must turn to her engagement with Gassendi. As we have seen, Cavendish manipulated philosophical ideas to construct allegories and analogies that aid the mind in conceptualising the possible functions of the natural world. While Gassendi's concerns were more historical than poetic or mythological, rehabilitating Epicurean atomism led him to conceive of the human mind as nearly coterminous with the imagination (or the faculty that processes images). Gassendi defended this position because he held both that Epicurus's philosophy was strictly grounded in sense perception, and that all observations were effects of imperceptible atoms.¹⁶⁹ Inspired by *De rerum natura*, he persistently used

¹⁶⁸ On Bacon's deviation from the Platonic notion of *prisca sapientia*, see Lewis, "Francis Bacon, Allegory and the Uses of Myth", 385-6. On Orpheus's place in this discourse, see Walker, "Orpheus the Theologian and Renaissance Platonism" (1953).

¹⁶⁹ See Joy, *Gassendi, the Atomist*, 167-79 and 184-90 and Fisher, *Pierre Gassendi's Philosophy and Science: Atomism for Empiricists* (2005), 234-5. On this as a problem for atomists more generally, see Meinel, "Early Seventeenth-Century Atomism: Theory, Epistemology, and the Insufficiency of Experiment" (1988).

analogies to accentuate correspondences between the observable and unobservable realms in attempts to make these stances compatible.¹⁷⁰ Resonating with Cavendish's discussion of the atomic "dance", he thus describes how the intrinsic motions of atoms lead them "to disentangle themselves, to free themselves, to leap away, to knock against other atoms, to turn them away, to move away from them, and similarly the capacity to take hold of each other, to attach themselves to each other, to join together, to bind each other fast".¹⁷¹

Gassendi's adumbration of atomic motions also has far-reaching ramifications for a crucial point of contention in Cavendish scholarship: does *Poems, and Fancies* advance a theory of mechanist or vitalist atomism? In part by concentrating on non-mechanical aspects of Gassendi's writing, scholars have begun to realise that the "mechanical philosophy" was far less mechanistic than was once supposed.¹⁷² Instead of being synonymous with Descartes' inertial mechanics, "mechanical philosophers" were simply those who applied analogies from the mechanical arts to natural bodies or their parts.¹⁷³ Because Cavendish shifted between mechanical and vital analogies to elucidate the micro-world, scholars have termed the atomism of *Poems, and Fancies* "mechanist-vitalist".¹⁷⁴ However, as the parallels between her poetic descriptions of atoms and those

¹⁷⁰ See Schrijvers, "Seeing the Invisible: A Study of Lucretius' Use of Analogy in the *De Rerum Natura*" (2007).

¹⁷¹ Gassendi, *Selected Works of Pierre Gassendi*, ed. by Bush (1972), 400. While I footnote from the translation of the selected works here—because it usefully underscores the literary quality of Gassendi's atomic representations—all subsequent citations are to the relevant Latin passages from *Animadversiones*, which has not yet been translated. Most studies of Gassendi are based on his *Syntagma Philosophicum*, but this was published posthumously in 1658, years after Cavendish wrote *Poems, and Fancies*.

¹⁷² See Osler, "How Mechanical was the Mechanical Philosophy? Non-Epicurean Aspects of Gassendi's Philosophy of Nature" (2001) and Clericuzio, "Gassendi, Charleton and Boyle on Matter and Motion" (2001).

¹⁷³ See Bennett, "'The Mechanics' Philosophy and the Mechanical Philosophy" (1986); Gabbey, "Between *Ars* and *Philosophia Naturalis*: Reflections on the Historiography of Early Modern Mechanics" (1993); and Wolfe, *Humanism, Machinery, and Renaissance Literature*.

¹⁷⁴ See Clucas, "The Duchess and the Viscountess: Negotiations between Mechanism and Vitalism in the

in Gassendi's prose commentaries suggest, such oscillation says little about the philosophical content of her poetry beyond the fact that shaping a theory of qualitative atomism required recourse to analogies.

Rather than discriminating between mechanical and vital motions, seventeenth-century philosophers worked with the Scholastic discourse of occult and manifest qualities. Significant in this regard is that Gassendi's endeavour to restore an empirical Epicurus arose out of the critique of Aristotle that he commenced in his 1624 *Exercitationes Paradoxicæ Adversus Aristoteleos*.¹⁷⁵ Drawing on Lucretius's account of magnetism and the work of William Gilbert, Gassendi thought that supplying atomic explanations for occult qualities might empower him to undermine the Aristotelian tradition and establish Epicurean atomism in its stead.¹⁷⁶ At the most basic level, occult qualities were insensible and hidden causes that could not be directly perceived, whereas manifest qualities were the causes of potentially observable phenomena.¹⁷⁷ Distinct from Epicurus's atoms and void, the Scholastics forwarded a theory of *minima naturalia* according to which all matter sits on a material continuum.¹⁷⁸ Because of this, there was no strict distinction between the macro and micro worlds, meaning that the bulk of natural phenomena could be studied as manifest qualities. While there was some debate

Natural Philosophies of Margaret Cavendish and Anne Conway" (2000); Rogers, *The Matter of Revolution*, 177-204; Stevenson, "The Mechanist-Vitalist Soul of Margaret Cavendish", 527-43; Tillery, "Margaret Cavendish, Natural Philosopher: Negotiating Between Metaphors of the Old and New Sciences" (2001); and Strauß, "Organismus versus Maschine: Margaret Cavendish' Kritik am mechanistischen Naturmodell" (1993).

¹⁷⁵ See Brundell, *Pierre Gassendi: From Aristotelianism to a New Natural Philosophy* (1987), especially 54-60 and Joy, *Gassendi, the Atomist*, 25-40. On the early modern anti-Aristotelianisms more generally, see Martin, *Subverting Aristotle: Religion, History, and Philosophy in Early Modern Science* (2014).

¹⁷⁶ See LoLordo, *Pierre Gassendi and the Birth of Early Modern Philosophy* (2007), 138-9.

¹⁷⁷ The classic studies are Hutchinson, "What Happened to Occult Qualities in the Scientific Revolution?" (1982); Millen, "The Manifestation of Occult Qualities" (1985); and Henry, "Occult Qualities and the Experimental Philosophy: Active Principles in Pre-Newtonian Matter Theory" (1986).

¹⁷⁸ The best study of *minima naturalia* is Murdoch, "The Medieval and Renaissance Tradition of Minima Naturalia" (2001).

over the few qualities that should be ascribed to sympathetic relations, most Scholastic thinkers agreed that phenomena such as the loadstone and iron were occult.¹⁷⁹ In a famous section of *Animadversiones* titled “De Qualitatibus vocatis Occultis” (“The Qualities that are Called Occult”), Gassendi condemns this discourse as a refuge for the idle.¹⁸⁰ Denying that the phenomenon of magnetism is inexplicable because insensible, Gassendi postulated that attraction and repulsion occur due to invisible hooks and cords that unite the two objects.¹⁸¹ Since he maintained that atomism allowed for the inference of a far greater range of natural causes, Gassendi insisted that he made occult qualities manifest. Yet, because he appealed to unobservable atoms to do so, there is a sense in which he did precisely the opposite: turned all manifest qualities occult.

Implicitly aligning her with Gassendi, Shadwell proclaimed in his elegy to Cavendish that “She never did to the poor Refuge fly / Of Occult Quality or Sympathy”.¹⁸² But subsequent chapters of this dissertation show that occult qualities played an increasingly prominent role in Cavendish’s natural philosophy, and already in *Poems, and Fancies* there are poems titled “Of the Sympathy of Atomes” and “Of the Sympathy of their Figures”.¹⁸³ Of perhaps most pertinence here, however, is a poem titled “It is hard to believe, that there are other *Worlds* in this *World*”, in which Cavendish asks:

What *Eye* so *cleere* is, yet did ever see
Those *little Hookes*, that in the *Load-stone* bee,
Which draw *hard Iron*? or give *Reasons*, why

¹⁷⁹ On qualities that were commonly considered occult, see Copenhaver, “A Tale of Two Fishes: Magical Objects in Natural History from Antiquity Through the Scientific Revolution” (1991).

¹⁸⁰ See Gassendi, *Animadversiones in decimum librum Diogenis Laertii* (Lyon, 1649), Book I, 347-62.

¹⁸¹ “Quippe ad quamvis attractionem, compexionemque vulgarem intercedunt uncini, chordæ, quiduis implexum impletensque: ad repulsionem verò seiunctionemque, stimuli, conti, quiduis explosum, &c. Pari autem modo ad minùs vulgarem intelligi licet uncinulos, chordulas, stimululos, contulos, & alia id genus, quæ tametsi inuisibilia, atque impalpabilia sint; non tamen nulla sint dicenda” (*Animadversiones*, Book I, 348).

¹⁸² *Letters and Poems*, 166.

¹⁸³ *Poems, and Fancies*, 12.

The *Needles point* still in the *North* will lye
 As for *Example, Atomes* in the *Aire*,
 We nere perceive, although the *Light* be *faire*.¹⁸⁴

In these lines, Cavendish underscores the inability of the human senses to perceive the atomic realm, suggesting a position that strongly resonates with the Aristotelian critique of atomism as an *ad hoc* postulation, detached from observation.¹⁸⁵ We saw in the introduction to this chapter that Cavendish coupled Sandys and Sylvester as encyclopaedic poets whom she admired, and her rhetorical question may have been transposed from a moment in Sylvester's *Divine Weekes and Workes* in which he writes:

But say (*Lucretius*) what's the hidden cause
 That toward the *North-Starre* still the Needle drawes,
 Whose point is toucht with Load-stone? lose this knot,
 And still-greene *Laurel* shall be still thy Lot:
 Yea, thee more learned will I then confesse,
 Then *Epicurus*, or *Empedocles*.¹⁸⁶

With a heavy dose of irony, the Protestant poet who was deeply indebted to the Scholastic tradition demands Lucretius to supply him with a satisfactory explanation for the relationship between the needle and the loadstone, claiming that he will crown him poet laureate if he could manage. Cavendish's recitation of Sylvester's reserve towards Lucretius's account of the loadstone indicates that her motivation for discussing the atomic hypothesis diverged from that of Gassendi.

While she may not have been a straightforward disciple of Lucretius, it is no coincidence that *Poems, and Fancies* is both the only piece in Cavendish's oeuvre that develops a theory of atomism and the only one written fully in verse. She restates

¹⁸⁴ *Poems, and Fancies*, 43.

¹⁸⁵ See Lüthy, "Atomism, Lynceus, and the Fate of Seventeenth-Century Microscopy" (1996).

¹⁸⁶ Sylvester, *Divine Weekes and Workes*, ed. by Snyder (2011), I.iii.967-72. On Lucretius in Du Bartas's original work, see Whitaker, "Du Bartas' Use of Lucretius" (1936) and Kany-Turpin, "Une Réinvention de Lucrèce par Guillaume du Bartas" (1991).

throughout her later treatises that “the opinion of atoms, is fitter for a poetical fancy, than for serious philosophy; and this is the reason that I waved it in my philosophical works”.¹⁸⁷ Cavendish of course titled her first publication *Poems, and Fancies*, and she frequently reflects on the functions of “*Fancy*, which is *Wit*” in this text.¹⁸⁸ Her juxtaposition of “poetical fancy” and “serious philosophy” in some later publications may imply a dichotomy between fiction and fact. A diffuse and shifting term during the seventeenth century, Cavendish sometimes exploited the polysemic nature of “fancy” to mock those who took her suppositions as the wild caprices of a woman. Yet, as has already been intimated, it was by no means the case that “fancy” only had negative significations. Indeed, Hobbes went so far as to declare that “whatsoever distinguisheth the civility of Europe, from the Barbarity of the American savuages, is the workemanship of Fancy, but guided by the Precepts of true Philosophy”.¹⁸⁹ He exalts fancy because of its role in creating analogies that both foster and enrich more theoretical explanations of natural phenomena by connecting raw sensory data to their unobservable causes. In this sense, Gassendi’s philosophy is perhaps even more of an apology for fancy than the imagination. By accentuating its fanciful aspects, Cavendish could both engage with the atomism that was widespread in the courts and salons, and subtly shift the signification of fancy to critique it as grounded more in poetic fancies than philosophical truths. For all the scholarly emphasis on Cavendish’s atomism, it only ever functioned as a useful representational tool. As we will see in subsequent chapters, Cavendish transferred from

¹⁸⁷ *Observations*, 129.

¹⁸⁸ *Poems, and Fancies*, 54.

¹⁸⁹ Hobbes, *Sir William Davenant's Gondibert*, ed. by Gladish (1971), 49. Margaret knew Davenant personally, and probably would have known of Hobbes’ preface, which Charles extracts from in Harley MS 6083, ff. 167. Also see Cavendish’s reference to “*W.Ds.*” poem in *Sociable Letters*, 257-60. On Hobbes and fancy, see Skinner, *Reason and Rhetoric in the Philosophy of Hobbes* (1996), 188-98.

focusing on wit or fancy to observation as she produced her more rigorously argued philosophical volumes, moving from an atomic discourse to an Aristotelian orientation in the meantime. Whereas the intervention of a potent but sometimes-deceptive fancy was necessary to traverse the void interspersed between atoms, the theory of *minima naturalia* implies a direct and continual movement from observations to reason.

Already in *Poems, and Fancies*, however, Cavendish's atoms swerved towards the traditions of *minima naturalia*. Accounting for the "*minima*" in its name, most Aristotelians held that a minimum amount of each element was needed for manifest qualities to remain what they were. For instance, a drop of wine that was plunged into a thousand gallons of water would be absorbed into the surrounding medium, because it falls short of the minimum that could resist it.¹⁹⁰ At the same time, due to the continuum, it was believed that each *minima* was dependent on the whole substance for its identity and existence. Salt water, for example, does not consist of some parts that are salt and others that are water. Rather, down to its smallest constituent part, the salt water mirrors the observable substance, with every part being both salt and water.¹⁹¹ For this reason, Aristotle maintained that atomic "mixtures" were mere heaps of unintegrated particulars.

Both Gassendi and Cavendish endeavoured to evade Aristotle's criticism by associating their atoms with elements, but Gassendi's emphasis on empirical evidence meant that he only touched on the atomic qualities of observable elements in passing.¹⁹²

Conversely, it has already been suggested that the relationship between atoms and

¹⁹⁰ For a relevant discussion, see Des Chene, "Wine and Water: Honoré Fabri on Mixtures" (2001).

¹⁹¹ Bostock, *Space, Time, Matter, and Form: Essays on Aristotle's Physics* (2006), 30-48.

¹⁹² He writes, for example, "Addo autem quatuor vulgaria, quæ admittuntur Elementa, Ignem, Aërem, Aquam, Terram, dici quidem posse Principia, sed non tamen prima: Materiam quoque, sed non primam, quippe cùm atomos priores, ex quibus & ipsa contexantur, habeant" (*Animadversiones*, Book II, appendix, cxxviii-cxxix). Also see *Animadversiones*, Book I, 185-7.

elements is central to the substance theory of *Poems, and Fancies*. Although scholars have deemed this an idiosyncratic facet of her thought, the rapport between atomic shapes and elements was not only latent in the work of Lucretius (and Gassendi following him) but was defended at length in the first textbook of natural philosophy to endorse atomism: Sebastian Basso's 1621 *Philosophia naturalis adversus Aristotelem*.¹⁹³ For a figure such as Basso—who was even more ingrained in an Aristotelian world than Gassendi—dwelling on the elemental aspects of atomism was an expedient way to make it a palatable hypothesis. While the extent of Cavendish's conversance with the traditions of Aristotelian thought in her early writing is difficult to gauge, it is notable that she wrote as early as her 1656 *Natures Pictures* that "I onely speak of him [Aristotle] as I have heard of him and his Works, not as I do learnedly know either: But by what I have heard of him, I do perceive and understand so much, that certainly he was such a Person, that Nature produced not the like in many Ages; therefore he is to be esteemed as a choyce Master-piece of Natures Works".¹⁹⁴ Her manipulation of the atomic discourse certainly underscores that Cavendish was already in conversation with Aristotelian ideas on matter, form, and motion in *Poems, and Fancies*.

In justifying their deviations from theories of *minima*, both Cavendish and Gassendi contended that the diversity of atomic shapes could account for otherwise inexplicable mixtures.¹⁹⁵ In doing so, Cavendish writes that "*Aiery Atomes* made are like a *Pipe*, / And *watry Atomes*, *Round*, and *Cimball* like", suggesting that atoms are not

¹⁹³ For the view that this is idiosyncratic, see Kargon, *Atomism in England from Harriot to Newton* (1966), 73-4. On Lucretius, see *De rerum natura*, II.455-8 and Furley, "Variations on Themes from Empedocles in Lucretius' Proem" (1970). Regarding Basso, see Lüthy, "Thoughts and Circumstances of Sébastien Basson: Analysis, Micro-History, Questions" (1997).

¹⁹⁴ Cavendish, *Natures Pictures* (London, 1656), 401.

¹⁹⁵ "Primum est, *Esse Atomos Diversimodè figuratas*. Non profectò quòd ipsarum figuræ discerni visu magis valeant, quàm de Magnitudine postmodum dicetur; sed quòd ea figuratio rationibus variis comprobari possit" (*Animadversiones*, Book I, 203).

simply made of air and water, but that these elements consist of a critical mass of “airy” or “watery” atoms.¹⁹⁶ By turning elements into watered down atomic accidents—instead of unified substances—Cavendish could discuss salty water or watery salt. Since atoms are particular shapes by degrees, she could also account for changes in elemental states. She writes that because it appears as if “*water* turns into *Aire*, / And *Aire* often runs into *water* faire”, it must be the case that airy and watery atoms are of similar shapes. When reified water turns into vapour, for example, the roundest watery atoms contract as the longer airy atoms dilate.¹⁹⁷ While Gassendi postulated geometric continuity between the atoms that formed air and fire (rather than water), he also used the degrees of atomic shapes to account for how continuities between microparticles produced the remarkable diversity observed in the natural world.¹⁹⁸

Stephen Clucas has brought considerable attention to the relationship between atoms and elements in Gassendi’s opus.¹⁹⁹ Juxtaposing Gassendi’s notion of “fire atoms” against the atomic shapes posited by some of the English exiles, he argues that Gassendi failed to exert any significant influence on Cavendish or her circles. In shaping this assessment, he opposed Robert Kargon’s view that the “powerful plausibility and systematic coherence” of Descartes’ and Gassendi’s ideas spurred on English atomism.²⁰⁰ Instead of seizing on a particular quality of Gassendi’s atoms, however, it is necessary to

¹⁹⁶ *Poems, and Fancies*, 7.

¹⁹⁷ *Poems, and Fancies*, 24.

¹⁹⁸ “Ac ut præteream illos, qui id docent, Inane non admittere, sine quo tamen neque rarefactio, neque condensatio potest fieri; ij animadvertere non videntur, non posse dici ignem mutari extinctione in aliquid aliud; quoniam illud, quod simplex est, nisi in nihilum abeundo, mutari non potest; aut certè, si admittant aliquid commune manere, quod priùs Ignis, postea sit aër, cùm illud quidem prima sit, communisque materies; primam ipsam materiem non esse ex se neque ignem, neque aërem, sed ipsas potiùs atomos, quæ certâ ratione constitutæ, Ignem; certâ, aërem conficere possint” (*Animadversiones*, Book II, appendix, cxxix).

¹⁹⁹ See Clucas, “The Atomism of the Cavendish Circle: A Reappraisal” (1994).

²⁰⁰ Kargon, *Atomism in England*, 63.

query the extent to which he was a system-builder. It is in fact the kaleidoscopic range of sources that Gassendi amassed to validate the atomic hypothesis that has led scholars to regard him as a less influential thinker than Descartes. As Richard Westfall once framed it in a witty conceit, “Gassendi was the original scissors and paste man, and his book contains all the inconsistencies of eclectic compilations”.²⁰¹ In a more positive light, the breadth of Gassendi’s knowledge led the classical scholar and divine, Meric Casaubon, to pronounce him “the most accomplished general scholar we have had of late”, despite being alarmed at his resuscitation of Epicurus.²⁰²

Strictly speaking, eclectics followed the sect founded by Potamo of Alexandria, which was paradoxically premised on the doctrine that philosophers should not follow a particular sect but rather incorporate the most penetrating insights from each school.²⁰³ Michael Albrecht has shown, however, that the term “eclectic” was often used to broadly indicate a method by which one rationally extracts concepts from numerous philosophies to augment the claims of a particular thinker or school.²⁰⁴ While the latter sort of “eclecticism” was commonplace during the seventeenth century, it was in many ways epitomised by Gassendi’s manner of identifying, differentiating, and assimilating positions from a wide range of sects to fortify Epicurus’s philosophy. Not simply a coincidence, there is a strong affinity between Gassendi’s substance theory and his manner of composition. Gassendi considered atoms of sundry shapes to join in the

²⁰¹ Westfall, *The Construction of Modern Science*, 39.

²⁰² Casaubon, *Generall Learning: A Seventeenth-Century Treatise on the Formation of the General Scholar*, ed. by Serjeantson (1999), 149.

²⁰³ On Potamo’s eclecticism, see Hatzimichali, *Potamo of Alexandria and the Emergence of Eclecticism in Late Hellenistic Philosophy* (2011).

²⁰⁴ See Albrecht, *Eklektik: eine Begriffsgeschichte mit Hinweisen auf die Philosophie- und Wissenschaftsgeschichte* (1994), especially 259-87 and, the review essay, Schneider, “Eclecticism Rediscovered” (1998). Also see Schneider, “Eclecticism and the History of Philosophy” (1997); Kelley, “Eclecticism and the History of Ideas” (2001); and Donini, “The History of the Concept of Eclecticism” (1988).

creation of bodies or mixtures, but to retain their figure as individual particles, just as he derived ideas from a multiplicity of thinkers to ratify his postulation of atoms, though the force of his assimilation was contingent on each source preserving its character as a piece that could be studied in its own right. If a single system erased his various reference points, then Gassendi would be unable to convince his reader both that Epicurean atomism could incorporate the very best philosophical concepts, and that he possessed the judgment required to identify and arrange these principles. From a critical standpoint, however, it is notable that Aristotle's critique that atoms could only form heaps echoes the modern reproach that Gassendi did not so much develop a unique philosophical position as gather heterogeneous notions that loosely relate to Epicurean philosophy. We will see more fully in subsequent chapters that problems relating to mixtures and literary composition were not lost on Cavendish.

As Clucas points out, Gassendi's proposal that fire atoms are circular was derived from Philoponus's commentary on Aristotle's *Physics*, which again displays his manipulation of principles from the *corpus aristotelicum* to restore Epicurus.²⁰⁵ Precisely because Gassendi conglomerated disparate sources to strengthen Epicurus's philosophy, his thought was ripe for figures in the Cavendish circle to reconcile with that of other thinkers. Since Cavendish was primarily acquainted with Gassendi's philosophy through conversation, she may not even have been familiar with his specific postulates, such as the shape of his atoms. For Cavendish, it was not so much the particulars of his atomism as the way in which Gassendi approached his recuperation of Epicurus—who had usually been dismissed as closed and dogmatic philosopher—that encouraged her to work with the atomic hypothesis in *Poems, and Fancies*. Applying Gassendi's synthetic approach to

²⁰⁵ Clucas, "The Atomism of the Cavendish Circle", 254.

the poems, commentaries, and prose treatises that she had read but not fully digested in all cases, Cavendish probably derived the shape of her “fire atoms” from Sandys’ overlaying of Lucretian and Pythagorean ideas.

Indeed, Gassendi believed that ideas rooted in historical precedence—instead of strictly empirical evidence—could only ever reach the threshold of probability.²⁰⁶ For this reason, the precise figures that he imputed to particular atoms were simply estimations summoned to strengthen his general claim that atoms are of diverse shapes.²⁰⁷ With this latter and more fundamental notion Gassendi was a response to Aristotle’s position, most forcefully expounded in *De generatione et corruptione*, that all of the ancient atomists considered atoms to be mathematical points.²⁰⁸ Because a point (or an entity without parts) is not a dimension, according to Aristotle, it cannot be likened to sensible magnitudes, much less serve as their fundamental constituents. Recognising that the relationship between mathematical entities and physical objects was by no means self-evident, Gassendi agreed with Aristotle that points are fictions or hypotheses contrived by the intellect. As he writes in a letter to Mersenne, “the points, lines, and surfaces defined by the mathematicians are nothing more than hypotheses, since every one of them could be made about non-existent things”.²⁰⁹ Gassendi used the language of “atoms” instead of “*semina*” in his discussion of microparticles to argue against Aristotle

²⁰⁶ See Joy, *Gassendi, the Atomist*, especially 66-82.

²⁰⁷ “Rationes habet Lucretius; sed priusquàm illas commemoremus, Adnotandum est nihil repugnare, quo minùs Atomì, quantumvis exiles, variè inter se sigurentur. Siquidem ex quo retinent aliquam magnitudinem, superficies in ipsis planas, orbiculareis, angulosas, regulareis, irregulareis concipere nusquam repugnat” (*Animadversiones*, Book I, 203).

²⁰⁸ On the background to debates surrounding point atomism, see Murdoch, “Aristotle on Democritus’s Argument Against Infinite Divisibility in *De generatione et corruptione*, book 1, Chapter 2” (1999) and “Infinity and Continuity” (1982). On Gassendi’s opposition to point atomism, see Joy, *Gassendi, the Atomist*, 83-105.

²⁰⁹ *Correspondance du P. Marin Mersenne, religieux minime*, Vol. 5, ed. by de Waard (1933), 533-4. On Gassendi and mathematics, see Magnard “La mathématique mystique de Pierre Gassendi” (1997) and Osler, “Volonté divine et vérité mathématique: le conflit entre Descartes et Gassendi sur le statut des vérités éternelles” (1997).

on his terms. By shaping his argument historically, Gassendi sought to both discredit Aristotle's authority and reinvigorate the qualitative atomism that Epicurus actually expounded.

But the flexibility of Gassendi's atomism meant that it could be corralled to accommodate aspects of the point atomism that some English thinkers had already developed. Clucas in fact downplayed Gassendi's impact on the *émigrés* in hopes of turning attention to the influence of the so-called Northumberland circle—or the thinkers loosely affiliated with Henry Percy, ninth Earl of Northumberland—on their atomic reflections.²¹⁰ Rather than polarising English and continental traditions of atomism, however, the Cavendish circle underscores how they could productively interact. Out of the exiles, Charles Cavendish was the most involved with the Northumberland circle, both engaging in a brief correspondence with Walter Warner, to whom he was connected through John Pell, and transcribing Thomas Harriot's manuscripts. Given the mathematical bent of these thinkers, Charles' interest in their ideas should come as no surprise. While the atomism of *Poems, and Fancies* is closer to that of Gassendi than Harriot, many of Margaret's departures from Gassendi can be explained by looking at what Charles may have conveyed to her from his study of Harriot, and especially his transcription of *De infinitis*.²¹¹

²¹⁰ On the Northumberland circle, see Clucas, "Corpuscular Matter Theory in the Northumberland Circle" (2001); Batho, "Thomas Harriot and the Northumberland Household" (2000); and Jacquot, "Harriot, Hill, Warner and the New Philosophy" (1974).

²¹¹ On Harriot's atomism, see Kargon, *Atomism in England*, 18-42; North, "Stars and Atoms" (2000); Gatti, "Minimum and Maximum, Finite and Infinite, Bruno and the Northumberland Circle" (1985); and Gatti, *The Renaissance Drama of Knowledge: Giordano Bruno in England* (1989), 49-68. For some necessary correctives, see Henry, "Thomas Harriot and Atomism: A Reappraisal" (1982). Concerning Cavendish and infinity, see Sokol, "Margaret Cavendish's *Poems, and Fancies* and Thomas Harriot's *Treatise on Infinity*" (2003).

In a letter to John Pell dispatched soon after the publication of *Animadversiones*, Charles wrote that “as far as I can guess my worthie friend Gassendes hath both maintained and opposed Epicurus where he ought most excellentlie”.²¹² As Charles intimates here, Gassendi’s revival of atomism for a Christian audience required him to emend and critique Epicurus’s ideas (as related by Diogenes Laërtius) on numerous fronts. Among his theological revisions, Gassendi argued for the existence of immaterial souls, angels, and of course a single and transcendent God.²¹³ In baptising Epicurus, he also denied the existence of an infinite quantity of atoms and worlds. Gassendi reasoned that if there are other worlds, then scripture would mention them, and since it does not, they must not exist.²¹⁴ Despite Charles’ valorisation of Gassendi’s adaptations, Harriot stimulated Charles interest in (if not necessarily his sanction of) some of Epicurus’s original ideas. Charles explores the concept of an infinite quantity of atoms when he transcribes Harriot’s argument from *De infinitis* that

in decreasing progressions wee must needs understand a quantitie absolutelie indivisible; but multiplicable infinitelie infinite till a quantitie absolutelie inmultiplicable be produced, which I may call universallie infinite. And in increasing progressions wee must needes understand that for a last there must be a quantitie inmultiplicable absolute but divisible infinitelie till that quantitie be issued, that is absolutely indivisible.²¹⁵

In this passage, Charles explicates a concurrent macro and micro movement towards the infinite, suggesting that an infinite quantity of infinitesimally small atoms exist in an unlimited expanse. After his speculations on the infinitely large and small, Charles makes

²¹² John Pell and His Correspondence, 562.

²¹³ The most important source on this topic is Osler, *Divine Will and the Mechanical Philosophy: Gassendi and Descartes on Contingency and Necessity in the Created World* (1994). Also see Michael and Michael, “Gassendi on Sensation and Reflection: A Non-Cartesian Dualism” (1988).

²¹⁴ “Iam, ne rationes alias consector, quæ Epicuri propriæ non sunt; dicendum solùm eius sententiam non repugnare modò sacris Literis, in quibus nunquam mentio Mundi multitudinis numero habetur; & quæcumque in iis traduntur de rerum origine, de providentia, de conditione hominis, de felicitate, deque mysteriis omnibus, singularem indicant Mundum” (*Animadversiones*, Book I, 233).

²¹⁵ BL, Harley MS 6002, ff. 6r.

his engagement with mixed mathematics unmistakable by writing that these are not mere mathematical hypotheses but refer to “reall” figures that have “perfect actuall being, or [are] in time, passed by motion both finite & infinite”.²¹⁶ He further explains that these infinitesimal bodies are “atomis”, and that “that everie line is compounded of ex atomis & therefore the peripherie of a circle one atomus is succeeding one an other infinitelie in such manner as that the peripherie is at last compounded of & made”.²¹⁷ In making the case for the existence of an infinite quantity of infinitesimal atoms, Harriot explicitly countered Aristotle’s discussion of extension and divisibility in Book 6 of his *Physics*. Instead of opposing Aristotle’s characterisation of ancient atomism on historical grounds—as Gassendi did—Harriot’s mathematical orientation led him to work through the implications of the atomic hypothesis as Aristotle fashioned it.²¹⁸ Charles’ notes (reflecting those of Harriot) are piecemeal, and he certainly did not produce a solution to Aristotle’s problem that material bodies could not consist of infinitely small atoms. But the salient point is that Charles engaged with both quantitative and qualitative approaches to atomism, and that he was especially concerned with questions of infinity.

For her part, Cavendish approved of Gassendi’s view that atoms are of a range of shapes, but she deviated from his belief that they are full, solid, and hard particles.²¹⁹ Instead, she held that “*Atomes* are some soft, others more knit, / According as each *Atome’s Figured; / Round and Long Atomes* hollow are, more slacke / Then *Flat*, or *Sharpe*, for they are more compact”.²²⁰ Rather than defining atoms in terms of Gassendi’s qualities, Cavendish established a strict atomic minimum by positing that each atom is of

²¹⁶ Harley MS 6002, ff. 6r.

²¹⁷ Harley MS 6002, ff. 9r.

²¹⁸ On Harriot’s point atomism, see Henry, “Thomas Harriot and Atomism”, especially 281-9.

²¹⁹ See A. LoLordo, *Pierre Gassendi*, 138-9.

²²⁰ *Poems, and Fancies*, 8.

the same magnitude and weight. Clarifying this point, she states that “When I say *Atomes* small, as small can bee; / I mean *Quantity, quality, and Weight* agree”.²²¹ Despite her inability to fully comprehend the more specialised mathematical issues that confronted point atomists, she was inspired by Charles’ engagement with Harriot to bring quantitative considerations to bear on Gassendi’s physical atoms. Gassendi held that God imbued atoms with innate motion at the beginning of time and that He could have created them to move at any speed, yet he continued to follow Epicurus in aligning atomic *vis motrix* (or internal inclination towards motion) and *gravitas* (or weight).²²² Because he postulated an array of atomic magnitudes and weights, he thought that atoms moved at various speeds, though the total quantity of atomic motion in the universe is constant.²²³ By contrast, Cavendish asserts that “severall *Figures* make all *Change / By Motions* helpe, which orders, as they range”.²²⁴ That is, atoms head in different directions due to their shapes (accounting for diversity and variance) but the consistency in size and weight means that all atoms move at the same speed (explaining order and stability).

While positing a quantitatively defined minimum, Cavendish agreed with Harriot that there is an infinite quantity of atoms and that there is no material maximum. As she writes in a poem titled “*The Infinites of Matter*”: “if that *Matter*, with which the World’s made, / Be *Infinite*, then more *Worlds* may be said; / Then *Infinites* of *Worlds* may we

²²¹ *Poems, and Fancies*, 8.

²²² The fullest account of Gassendi on atomic motion is Messeri, *Causa e spiegazione: La fisica di Pierre Gassendi* (1985), 74-93.

²²³ “Ac non dico quidem, ut aliqui purant, huiusmodi corpuscular esse Atomos (quipped cū in minimo eorum multæ contineantur Atomorum myriads) utor dumtaxat eorum similitudine, ut cū tota Atomorum quasi nation uisui quantumlibet acuto imperuia, & quasi cæca sit, intelligamus illam radiis rationis ita illustrari, ut & Atomī mente peruideantur, & compatere ipsis concipiamus magnitudinum varietatem” (*Animaversiones*, Book II, Appendix, cxxiv-cxxv). Also see LoLordo, *Pierre Gassendi*, 142-3.

²²⁴ *Poems, and Fancies*, 10.

agree, / As well, as *Infinities* of *Matters* bee”.²²⁵ In these lines, Cavendish uses “infinite” as a temporal marker and “infinities” quantitatively; the temporal application of “infinite” (as synonymous with eternal) was a common practice during the seventeenth century. Going through the potential relationship between infinite and finite space and time in his transcription from Harriot, for instance, Charles wrote that “a finite space given cannot be moved in a finite time but in an infinite time. Allso that an infinite space may be moved in a finite time. Allso that an infinite space given, may be moved not in a finite time”, and so forth.²²⁶ At this point in his manuscript, Charles participates in the very Gassendian practice of identifying all of the logical possibilities, but he abstains from declaring his preference or teasing out their ramifications for occurrences in the natural world. More strongly, Cavendish strays from Gassendi in postulating that an infinite quantity of atoms has always existed. If this is the case, she reasons that there must be and always have been an infinite quantity of worlds, for an infinite cannot give rise to a finite.²²⁷ Embracing one of the speculative possibilities in Charles’ manuscript, she thus argues that there is an infinite quantity of finite worlds.

Cavendish grapples with the relationship between infinite and eternal space and finite and closed worlds when she argues that “In *Infinities* no *Center* can be laid, / But if the *World* has *Limits*, *Centre*’s made. / For whatsoe’re’s with *Circumference* fac’d, / A *Center* in the midst must needs be plac’d”.²²⁸ A centre cannot exist in the infinite void, averred Cavendish, for only finite and corporeal things (such as the earth) possess the limits that allow for centrality. Having said that, Cavendish follows Brahe in contending

²²⁵ *Poems, and Fancies*, 30.

²²⁶ Harley MS 6002, ff. 5v. See *OED*, “infinite”, adj.1c and 2.

²²⁷ On the plurality of worlds, see Warren, “Ancient Atomists on the Plurality of Worlds” (2004) and McColley, “The Seventeenth-Century Doctrine of a Plurality of Worlds” (1936).

²²⁸ *Poems, and Fancies*, 29.

that earth and the seven classical planets are kept on their course even within this world-system by multiple interconnected centres. Expanding this conjecture to account for planetary order at large, she comments in the margin that if “there be Infinites of Worlds; then there may be infinites of Centers, although not a Center in Infinites”, or a centre in the void that contains an infinite quantity of world-systems.

Led by religious considerations, Gassendi held the antithetical opinion that this earth is a single world engulfed in infinite space, implying just such a centre.²²⁹ In part because Gassendi rejected the Epicurean (and Pythagorean) notion of an infinite quantity of worlds, it has been argued that Cavendish’s affirmation of this position is indicative of her heterodoxy.²³⁰ Engaging with Aristotle’s *De caelo*, however, many Scholastic thinkers (including Aquinas) proposed that a plurality of world-systems might actually be most commensurate with God’s omnipotence.²³¹ Of pertinence in this regard is “A Copie of Phylosophycall Verses by the Marquese of Newcastle that Meere Nature teacheth Man kind both to Acknowledge A God and Religion” in one of William Cavendish’s manuscripts. While these manuscripts are hardly concerned with philosophical topics—mostly containing love songs and cavalier poetry—he writes in this poem that “The Fixed Starres all fiery Sunes their Light / Millions of worldes bout them as Plannets bright / Hange in the Ayre and all their stations so / Not jostling one another as they goe”.²³² He proceeds to declare that these worlds point to the power and glory of God, for “none but weake Braynes can thinke this by Chance”. The way that William’s poem frames the

²²⁹ See LoLordo, *Pierre Gassendi*, 127-9.

²³⁰ See Cottagnies, “Brilliant Heterodoxy: The Plurality of Worlds in Margaret Cavendish’s *Blazing World* (1666) and Cyrano de Bergerac’s *Estats et Empires de la lune* (1657)” (2014).

²³¹ See Dick, *Plurality of Worlds: The Origins of the Extraterrestrial Life Debate from Democritus to Kant* (1982), especially 23-43.

²³² NUL, MS Pw V 25, ff. 60v.

discussion of innumerable worlds attests to the fact that thinkers in the Cavendish circle were engaging with the Scholastic tradition as much as the atomic discourse when developing these ideas. Cavendish grapples with these theological issues in her later works, but she was more concerned with mathematical and logical problems in *Poems, and Fancies*.

At the same time, as was suggested in the first part of this chapter, Cavendish brings atomic qualities to bear on astronomical questions in a way that reveals an implicit engagement with the traditions of Aristotelian thought. She maintains that “the *Aire* each *World* doth inclose / Them all about, then like to *Water* flowes; Keeping them *equall*, and in *order* right”.²³³ Whereas airy atoms make each world orderly and self-contained spheres, we have seen that Cavendish considered fire atoms to bond planets to their suns, working with the common notion that fire’s subtlety enabled it to pass through bodies. But Cavendish also held that a cluster of atoms are “wreath’d so hard about that *point*, / As they become a *Circle* without *joynt*”.²³⁴ In other words, a mass of fire atoms not only form the centre of the sun but also the earth and planets. Gassendi may have prompted Cavendish to develop these ideas, since Charles expressed his hope in a 1650 letter to Pell that Gassendi would “yet publish more of his excellent pieces, especiallie of *Astronomie*”, chiefly thinking of his 1647 *Institutio astronomica iuxta hypotheses tam veterum quam Copernici et Tychonis Brahei*.²³⁵ In any case, borrowing from the genealogy of Platonic-Pythagorean thought—and especially Kepler—Gassendi

²³³ *Poems, and Fancies*, 30. The classic work on these issues is Koyré, *From the Closed World to the Infinite Universe* (1968).

²³⁴ *Poems, and Fancies*, 30.

²³⁵ *John Pell and His Correspondence*, 152.

postulated that a “soul” caused the planets to rotate on their axes.²³⁶ Rather than deeming this soul incorporeal, Gassendi synthesised Pythagorean and Lucretian ideas to argue that the world-soul was comprised of a dense constellation of circular atoms. According to Gassendi, the motion inherent in one atom is transmitted to its neighbour, which passes the received propulsion to the third, and so forth. The process of atomic transmission due to the circular arrangement of atoms causes the planets and the sun to rotate endlessly. It was probably this notion that led Gassendi to propose that fire atoms are circular.

Cavendish’s fire atoms at the centre of the earth resemble those of Gassendi, but hers are even more tightly interwoven. Whereas the watery atoms that make the world a self-contained sphere disperse after many years, the “points” of fire at the centre of the planets remain eternally. As Cavendish puts it: “*fixed Stars*, which give a twinkling *Light*, / *Are Center Worlds of Fire*, that shineth bright”.²³⁷ Playing with the Aristotelian notion of the fixed stars, Cavendish substitutes unassailable points of fire for the well-entrenched concept of heavenly immateriality to account for the fixity of the firmament. Based on the equivalence between “atoms” and “points” in the atomic discourse, she puns on the latter term throughout *Poems, and Fancies*, such as when she writes that “The *Long streight Atomes* like to Arrowes fly, / Mount next the points, and make the *Aiery Skie*”.²³⁸ Along with using the qualitative features of Gassendi’s atomism to posit unchangeable points that reflect Harriot’s discourse, Cavendish here engages with Lucretius and Pythagoras. While Sandys bypasses this in his discussion of the seeds of

²³⁶ See Sakomoto, “The German Hercules’s Heir: Pierre Gassendi’s Reception of Keplerian Ideas” (2009). On Gassendi’s changing attitudes towards Copernican cosmology, see Brundell, *Pierre Gassendi*, 30-47 and LoLordo, *Pierre Gassendi*, 24-33.

²³⁷ *Poems, and Fancies*, 29.

²³⁸ *Poems, and Fancies*, 6.

fire, Pythagoras seems to have held that atoms are mathematical points.²³⁹ In line with his belief that numbers are the ultimate constituents of reality, this permitted Pythagoras to advance the notion that the earth moves in a perfect circle, despite its materiality.

Cavendish uses the shape of fire atoms that Sandys presents in his discussion of Lucretius to argue that a concatenation of pointed atoms at the centre of the earth form an immutable “point” that causes the earth to rotate on its axis, eventually turning into a sun.

In the traditional categorisation of university disciplines, mathematics was detached from physics, which was chiefly a linguistic and hermeneutic undertaking, as was all philosophy.²⁴⁰ Suggested by the affinities between Aristotle’s *Categories* and *Physics*, the predication of accidents to substances was inextricable from the discussion of actual matter, and in this sense natural (rather than mathematical) language could only apply to material things. In coming to terms with how mathematics could be squared with the traditional understanding of philosophy, Cavendish’s engagement with ancient and modern astronomical ideas is integral, since astronomy was usually regarded as an intermediary between mathematics and physics. The notion of a “point” was an especially convenient way to play with the categorisation of astronomy as a mathematical art that was part of the quadrivium, while engaging with the realisation that the distinction between physics and astronomy had all but collapsed with the discussion of particles that fall outside of the scope of observation and the materialisation of the heavens. Identifying parallels between the hardly observable heavenly bodies and unobservable microparticles, Cavendish splices the ideas of Gassendi and Harriot to

²³⁹ On the changes to the notion of an atom, see van Melsen, *From Atomos to Atom: The History of the Concept of Atom* (1960). On Pythagoras in particular, see Heninger, *Touches of Sweet Harmony*, 71-145.

²⁴⁰ On the categorisation of mathematics in the universities, see Feingold, “The Mathematical Sciences and New Philosophies” (1997).

highlight the hypothetical qualities of astronomical and atomic postulates. While she stressed the power of representation in the process of comprehending natural causes, the very materialisation of the heavens meant that any application of mathematics to the natural world necessarily yielded probable rather than apodictic knowledge.

Cavendish's treatment of mathematics as a speculative and hypothetical wellspring teeming with astronomical and philosophical material is at odds with its later instantiations: as either the lowly mechanical art of the experimentalists or the certain mathematical laws of Newtonian physics. In the process of shifting mathematics towards physics, Cavendish found poetry to be a suitable medium, since its use of measured lines to capture the qualities of the natural world mediates between the quantitative and qualitative aspects of atomic and astronomical discourses. In this regard, she can be seen as following not only the Epicureans but also the Pythagoreans, who held that the mathematical make-up of the natural world endowed poetic expression with its potency.²⁴¹ Instead of seeing quantification as steering natural philosophy in the direction of an exact science, Cavendish underscores how mathematical concepts can be deployed to speculate on substances within a distinctly poetic framework.

1.3. Atomism, Eclecticism, and the New Philosophy

While Gassendi sought to ground his Epicurean philosophy in empirical data, the fact that his atoms eluded even the most acute microscopes left other thinkers to speculate on their qualities and functions. More than his stress on the empirical, it was Gassendi's historically-informed and synthetic approach to Epicurus's philosophy, which had traditionally been deemed dogmatic, that led those in the Cavendish circle to appreciate

²⁴¹ See Heninger, *Touces of Sweet Harmony*, 287-400.

his ideas. The influence of Gassendi led even Hobbes—who is usually thought of as a proponent of plenism due to his 1655 *De corpore*—to write to Mersenne in 1648 that “to sum up my opinion about the vacuum, I still think what I told you before: that there are certain minimal spaces here and there, in which there is no body”.²⁴² Far from triggering a linear progression towards a “modern” atomic discourse, however, Gassendi’s atomism was slowly superseded over the course of the 1650s. As Levitin has cogently argued, Charleton was the only notable proponent of Gassendi’s Epicurean atomism in the early Royal Society.²⁴³ Levitin does not dwell on the reasons for this change of fate, but it seems that Gassendi’s attack on the speculative aspects of Aristotle’s natural philosophy and his emphasis on empirical evidence in fact contributed to the marginalisation of Epicurean philosophy. As Boyle wrote in his *Certain Physiological Essays* of 1661, already the experimenters had “produc’d Inventions of greater use to Mankind, than were ever made by *Leucippus*, or *Epicurus*, or *Aristotle*, or *Telesius*, or *Campanella*, or perhaps any of the speculative Devisers of new Hypotheses”.²⁴⁴ Probably with Gassendi in mind, Boyle places Epicurus alongside Aristotle in his list of speculative thinkers who were overly reliant on experimentally unhinged hypotheses.

Figures in the Cavendish circle considered Gassendi to strike the right balance between observation and speculation, but there was a movement away from simple empiricism and towards experimentation during the 1660s. Despite his periodic recourse to optical experiments, Gassendi was primarily a historian, and his Epicurean atomism did not straightforwardly fit into the incipient separation of experimental and speculative natural philosophy. Because this distinction will have significant implications for

²⁴² *The Correspondence of Thomas Hobbes*, 167.

²⁴³ Levitin, *Ancient Wisdom*, 329–68.

²⁴⁴ Boyle, *Certain Physiological Essays and Other Tracts Written at Distant Times* (London, 1661), 25.

subsequent chapters, it is worth dwelling on for a moment. The uncoupling of speculation and experimentation largely transpired along institutional lines after the Interregnum. Figures in the so-called “Oxford Experimental Club” undertook experiments during the 1650s, but it was not nearly so ubiquitous as it later became under the auspices of the Royal Society.²⁴⁵ In reaction to this development, most figures within the universities (and especially Oxford) attempted to shield their institutions by sticking closer to the traditional Aristotelian philosophy than was previously the case.²⁴⁶ The rare thinker who was on the continent with the Cavendishes during the Interregnum later became an active member of the Royal Society, such as Pell and William Petty, the latter of whom also congregated with the Oxford Experimental Club from 1649-52. But, on the whole, those affiliated with the Cavendishes were of an older generation, and their ideas were only of minor interest to the later experimentalists.

The Royal Society’s core rather consisted of figures that were part of the Oxford Experimental Club and Gresham College in London. Under these circumstances, most experimental philosophers considered Gassendi’s atomism to be overly speculative and reductive, whereas figures in the schools found his opposition to Aristotelian thought unpalatable, despite his use of scholarly commentaries.²⁴⁷ Drawing on both of these discourses, we will see that Cavendish came to interpret Gassendi’s atomism as reductive, and to believe that his anti-Aristotelianism was rhetorically crude and

²⁴⁵ On the period prior to the founding of the Royal Society, see Feingold, *The Mathematicians’ Apprenticeship: Science, Universities and Society in England, 1560-1640* (1984); Hunter, *Science and Society in Restoration England* (1981); and Webster, *The Great Instauration: Science, Medicine and Reform, 1626-1660* (2002).

²⁴⁶ On this division, see Anstey, “Experimental versus Speculative Natural Philosophy” (2005) and especially Feingold, “‘Experimental Philosophy’: Invention and Rebirth of a Seventeenth-Century Concept” (2016).

²⁴⁷ On atomism as reductive, see Lüthy, “The Fourfold Democritus on the Stage of Early Modern Science”, 449-50.

historically misleading. Yet, at the cost of his atomism becoming peripheral, Gassendi's characterisation of Aristotle as overindulging in speculations was so successful among figures in the Royal Society that it made speculative natural philosophy nearly synonymous with the traditions of Aristotelian thought. Speculation moved from having a critical role in the "new philosophy" with figures among the Cavendish circle to being scorned by the Royal Society's propagandist and many practising experimentalists.²⁴⁸ The principal point here is that it was not so much the "new philosophy" as experimentation that precipitated natural philosophy's estrangement from the world of literature and letters, which is a process in which Gassendi incidentally performed a substantial role.

More than a mere homage to Lucretius, Cavendish's discussion of philosophical topics in her poetic work was the beginning of a career-long campaign to show that literary amateurs could capably grapple with speculative philosophical questions. After the Restoration—when speculative natural philosophy increasingly became associated with Aristotelian-Scholastic thought—Cavendish proffered her books to all Oxford and Cambridge colleges immediately after they were printed. Yet she did not distribute her early works amongst the universities, but rather sent them to individual scholars that she respected and from whom she hoped to receive feedback. In part, this is because she was still making inroads with the librarians of Oxford and Cambridge. In March 1655, Cavendish received a letter from Barlow thanking for her newly published *Philosophical and Physical Opinions*.²⁴⁹ We know from a copy of *Philosophicall Fancies* in the Bodleian, however, that Cavendish sent a personal copy of this work to Barlow in 1653.

²⁴⁸ See Rees, "Bacon's Speculative Philosophy" (1996).

²⁴⁹ *Letters and Poems*, 66.

Since *Philosophical and Physical Opinions* is an extension of *Philosophical Fancies*, Cavendish was evidently seeking approval from Barlow with an eye to republishing it for a wider audience.²⁵⁰ On the slightly later date of 22 October 1656, William Moore—who was elected University of Cambridge librarian in 1653—also wrote his first letter to Cavendish in which he affirms the successful delivery of “two Books (lately composed by your Excellency) to be sent to *Cambridge*, one to be placed in the Publick Library there, and the other to be bestowed upon my self”.²⁵¹ But it also seems that she saw the courts as a sphere in which this sort of literary and speculative natural philosophy could be undertaken during the late 1640s and early 1650s. One thinker to whom Cavendish sent her early works directly after their publication was Constantijn Huygens.²⁵² In this regard, the copy of *The World’s Olio* at the Princeton University Library is telling. Here the title page has the inscription “Constanter”, with the record of presentation showing Cavendish putting her little Latin to good use: “Antverpiae 17 jul. 1655 dono March. Newcastle mariti autoris”.²⁵³ Suggesting that Constantijn held this gift in high esteem, he adorned its title page with his own portrait, done by Christiaan Huygens. While the first known epistle from the elder Huygens to Cavendish is from 1657, this gift copy implies that they were in contact during an earlier period. Regarding *Poems, and Fancies*, Huygens also penned a letter to the talented musician and lady-in-waiting to the Princess

²⁵⁰ See Bod., *Philosophicall Fancies*, 8° N 2 Art.BS. Along with the date of 1653, this copy is marked “T.B.” on the verso, meaning it belonged to Thomas Barlow’s personal library before it was bequeathed to the Bodleian. In Greek on the recto is also “αἰὲν ἀριστεύειν” or “always strive to be best” from Homer’s *Iliad* 6.208. This motto commonly appears in Barlow’s own books and less frequently in those he handled at Queen’s College: see, for example, Hobbes, *Leviathan*, OQ FF.g.514. On Barlow’s bequests to the Bodleian, see Poole, “Thomas Barlow’s Books at Queen’s” (2013).

²⁵¹ *Letters and Poems*, 67. On William More, see Roberts, “William Moore”, *ODNB*.

²⁵² On Cavendish and Huygens’ correspondence, see Akkerman and Cornoraal, “Mad Science Beyond Flattery: The Correspondence of Margaret Cavendish and Constantijn Huygens” (2004).

²⁵³ See Princeton University Library, *The World’s Olio*, RHT 17th-753. Thanks to Rhodri Lewis for this reference.

of Orange, Ultricia Swann, in September 1653. In this epistle, he relayed that Cavendish's "wonderfull Booke" with its "extravagant attomes kept me from sleeping a great part of last night, in this my little solitude".²⁵⁴

It has been argued that "Huygens was in particular interested in Cavendish's written works on science", but we know from Huygens' library catalogue that he owned all of Cavendish's publications, and some of them in multiple editions.²⁵⁵ As intimated in his comment to Swann, Huygens seems to have rather appreciated the breadth and literary quality of her philosophical output. It is true that Huygens still recalled in 1671 "the many favours she [Cavendish] hath been pleased to bestow upon me ~~beyond sea~~ in former times, ~~even~~ especially of those favours Madam w^{ch} I remember did cost y^e ~~Grace~~ many a white petticoat a week".²⁵⁶ That is, Cavendish would conduct weekly experiments, and discuss her findings with Huygens. But this was in a period before experimentation had become a rhetorically charged practise, and it was perfectly congruous for a figure to experiment and be a humanist who was cynical towards the neoteric's endeavour to unhinge natural philosophy from poetic concerns.²⁵⁷ While Cavendish did not have the classical training of Huygens, he was part of the same world. As we have seen, Bacon was another such figure, and it is almost certainly no coincidence that, in a book of essays, Cavendish states that what makes "a good *Poet*, is that which makes a good Privie Councillor, which is, observation, and experience, got by time and company".²⁵⁸ Due to figures such as Bacon, Gassendi, and Huygens, Cavendish

²⁵⁴ Koninklijke Bibliotheek, KA 48, ff.46r. On Ultricia Swann, see *John Pell and His Correspondence*, 29-30.

²⁵⁵ See *Catalogus der Bibliotheek van Constantyn Huygens Verkocht op de Groote Zaal van het Hofte's Gravenhage, 1688*, ed. by Stockum (1903), 21, 23-5, and 48.

²⁵⁶ Koninklijke Bibliotheek, KA 48, ff. 16r.

²⁵⁷ Grafton, "The New Science and the Traditions of Humanism", 203-5.

²⁵⁸ *The World's Olio*, 5. The classic revisionist account of Bacon and humanism is Vickers, "The Myth of

saw the courtly sphere as an ideal place to practise the “new philosophy” prior to the Restoration.

Given the evidence presented in this chapter, it will come as no surprise that Cavendish sought to align herself with these savants. But such a conclusion stands in tension with the scholarly assumption that Cavendish was a simple champion of novelty. Following a large body of scholarship, a recent study of Cavendish’s early works has gone so far as to claim that the “extreme anti-humanism and aggressive modernity sometimes attributed to Bacon, or Hobbes, or Sprat must therefore be qualified. Margaret Cavendish’s model of literary creativity, however, exemplifies how certain writers did take anti-humanism to an extreme degree”.²⁵⁹ Yet we have seen that *Poems, and Fancies* is an eclectic compilation, and that any original insights arise from Cavendish’s manipulation of a wide range of ancient and modern ideas. Less keen to support the claims of a particular school than Gassendi, Cavendish assimilated an assortment of atomic approaches: whether those of Pythagoras and Lucretius (through her reading of Sandys’ commentaries) or Gassendi and Harriot. What is more, already in *Poems, and Fancies* she strove to mediate between atomism and a theory of *minima* with her emphasis on the union of atoms and elements.

Even so, there is a sense in which such an eclectic collation serves Gassendi’s rhetorical purposes better than Cavendish’s. While Gassendi’s philosophy was appreciated and manipulated within the Republic of Letters, he held consecutive university posts and used his rehabilitation of Epicurus as a chance to exhibit his

Bacon’s Anti-Humanism” (1999). Also see Grafton, “Where was Salomon’s House? Ecclesiastical History and the Intellectual Origins of Bacon’s *New Atlantis*” (2001), 21-38 and Sargent, “Francis Bacon and the Humanistic Aspects of Modernity” (2002). On Huygens’ appreciation of Bacon, see Alpers, *The Art of Describing: Dutch Art in the Seventeenth Century* (1983), especially 4-10.

²⁵⁹ Scott-Baumann, *Forms of Engagement: Women, Poetry and Culture, 1640-1680* (2013), 38.

humanist training. By contrast, Cavendish strove to make her learning seem natural by producing a piece of natural philosophy in verse, unfettered by scholarly footnotes and quotations. Doing so was commensurate with the expectation that courtiers would enact the graceful simulation and dissimulation of *sprezzatura*, famously codified by Baldassare Castiglione.²⁶⁰ Adapting this principle towards philosophical ends, Bacon had intoned that “no author should be cited save in matters of doubt”, since ostentatious displays of learning were at odds with those effortless expressions that formed the book of nature.²⁶¹ In subsequent chapters we will see how Cavendish moves towards an Aristotelian orientation, in part because she believes that Aristotle’s substance theory and methodology is more congenial to courtly mores, despite its increased localisation in the schools.

²⁶⁰ See Castiglione, *The Book of Courtier*, ed. by Javitch (2002), 32.

²⁶¹ *OFB*, Vol. 11: *The Instauration Magna Part II*, 456–7. Also see his essay on “Simulation and Dissimulation”, *OFB*, Vol. 15: *The Essayes*, 20–22. On *sprezzatura* and natural philosophy, see Wolfe, *Humanism, Machinery, and Renaissance Literature*, especially 68–73 and 133–37 and Briggs, *Francis Bacon and the Rhetoric of Nature* (1989), 118–31.

Chapter 2. Medicine: The Spirits of Physiology

Cavendish wrote *Philosophicall Fancies* in haste after sending *Poems, and Fancies* to the press, “out of a desire to have it joyned to my *Booke of Poems*”. Although she supposedly churned out most of *Philosophicall Fancies* in less than a month, “it came a weeke too short of the Presse”.²⁶² For this reason, Cavendish’s second publication appeared in May 1653, two months after *Poems, and Fancies*. Because *Philosophicall Fancies* is the shortest piece in Cavendish’s oeuvre (published in octavo), and there are fewer extant copies than any of her other works, scholars have mostly overlooked it. When it has been noticed, *Philosophicall Fancies* has usually been read as a continuation of her earlier atomism.²⁶³ But a pronounced shift in Cavendish’s substance theory in fact occurred between the publications of her first two works. “Atoms” are only mentioned once in *Philosophicall Fancies*, and this comes as the conditional statement that there is “*Matter* that is thinnest or thickest, softest or hardest, yet it is but *one Matter*; for if it were divided by *degrees*, until it came to an *Atome*, that *Atome* would still be the same *Matter*, as well as the greatest bulk”.²⁶⁴ Instead of reworking the atomic hypothesis, Cavendish appeals to “spirits”. The implication throughout *Philosophicall Fancies* is that atomism is reductive and incapable of accounting for the complexities of animal psychology and physiology. Cavendish’s discourse on spirits accordingly marks her transition from a concern with elements and astronomy to an emphasis on explaining the sentience and intelligence of animal life. While Bacon’s discussion of the spirits of natural bodies in

²⁶² *Philosophicall Fancies*, C1r.

²⁶³ For the notion that *Philosophicall Fancies* is a continuation of her earlier atomism, see Kargon, *Atomism in England*, 73 and Sharp, “Walter Charleton’s Early Life (1620-1659), and Relationship to Natural Philosophy in Mid-Seventeenth Century England” (1973), 329-30.

²⁶⁴ *Philosophicall Fancies*, 2-3.

“Proserpine, or Spirit” no doubt provided a mythological basis for the shift in Cavendish’s substance theory, this chapter shows that the Galenic and chymical ideas circulating in the courts were the most immediate inspirations behind her revision.

The first section of this chapter reveals that Cavendish was responding to Descartes’ physiology in *Philosophicall Fancies*, well before previous scholarly accounts have proposed.²⁶⁵ In *Philosophical and Physical Opinions*—the revised and supplemented edition of *Philosophicall Fancies*—Cavendish remarks that she had “never read more of Mounsieur *Des-Cartes* then half his book of passion”.²⁶⁶ Extant manuscript and epistolary evidence corroborate the claim that her early publications were engaging with Descartes’ last published work, his *Les passions de l’âme* of 1649.²⁶⁷ As we saw in the last chapter, Charles Cavendish tutored Margaret during the early 1650s, and there are extensive notes on Descartes’ work in his manuscripts, including transcriptions from *Les passions de l’âme*.²⁶⁸ Two letters from the Bishop and one-time Regius Professor of Greek at Cambridge, Robert Creighton, to William and Margaret in December 1653 also paired *The Passions of the Soule* with *Philosophicall Fancies*. Cavendish returned to the Royalist *émigrés* in Antwerp after publishing *Philosophicall Fancies* in England in 1653. Following a visit to the Cavendishes in this year, Creighton wrote to them that “When I last had the honour to kiss your Excellencies Hands at Antwerp, you were pleased to

²⁶⁵ See Broad, *Women Philosophers of the Seventeenth Century* (2002), 40-55; Sarasohn, *The Natural Philosophy of Margaret Cavendish*, 129-35; and O’Neill, “Women Cartesians, ‘Feminine Philosophy’, and Historical Exclusion” (1999), 237-8. Erin Webster has looked at Cavendish’s critique of Descartes from a socio-political perspective: see “Margaret Cavendish’s Socio-Political Interventions into Descartes’ Philosophy” (2011).

²⁶⁶ *PPO*, B3v.

²⁶⁷ On Descartes’ reception in England, see Rogers, “Descartes and the English” (1985) and Harrison, “The Influence of Cartesian Cosmology in England” (2002). On *Les passions de l’âme* in particular, see Tilmouth, “Generosity and the Utility of the Passions: Cartesian Ethics in Restoration England” (2007).

²⁶⁸ See Harley MS 6083, ff. 106r-v. Also see Charles’ comparison of the views on the passions from Aristotle, Hobbes, Descartes, and Digby in Harley MS 6083, 159r-v and the transcription from Descartes’ discussion of spirits in Harley MS 6083, ff. 166r-v and 177r-v.

bestow on me, *The Passions of the Soul*, Written by the Noble *Du Cartes*, in Token of your singular Love and Respect”.²⁶⁹ Shortly after this, upon returning to Utrecht, Creighton was sent copies of both *Poems, and Fancies* and *Philosophicall Fancies* by way of George Morley. We know that Creighton received the latter work because he thanks Margaret for multiple “Books”, and she had only published *Poems, and Fancies* and *Philosophicall Fancies* by the end of 1653. He also refers to the books being “both in Verse and Prose”, and *Poems, and Fancies* is almost entirely in verse. We cannot be sure whether Cavendish’s quick succession of gifts was intentional, yet Creighton couples them by writing that he felt “some of *Du Cartes* Passions, transferred from your first gift to your second”, or from *The Passions of the Soule* to *Philosophicall Fancies*.²⁷⁰ I underscore that this casual comment has substantial ramifications, as Cavendish transferred the spirits of Descartes’ *Passions* to produce the probabilistic “fictions” of *Philosophicall Fancies*. While she has sometimes been aligned with Descartes, this chapter argues that Cavendish recuperated a fuller and more sensitive notion of animal life against Descartes’ mechanical physiology.²⁷¹

The second part of the chapter shows that the likes of Théodore de Mayerne and Kenelm Digby motivated Cavendish’s critique of Descartes. Mayerne treated Cavendish from 1648 onwards, and she must have also interacted with Digby during this period, for he expressed his pleasure that she retained “so obliging a memory” of him in 1657. He hailed her as an ornament of his age, and predicted that she “will be the Envy of all future

²⁶⁹ *Letters and Poems*, 88.

²⁷⁰ On reading and the passions, see Johns, *The Nature of the Book: Print and Knowledge in the Making* (1998), 380-443.

²⁷¹ See Semler, “Early Engagement”. While he pays more attention to the ways in which Cavendish critiqued Descartes, she is also aligned with Cartesian rationalism throughout Cuning, *Cavendish*.

ones”.²⁷² Cavendish’s engagement with Mayerne and Digby—who were friends, and undertook chymical experiments together—is evident in an unstudied medical book at the University of Nottingham in which William and Margaret thoroughly documented and supplemented the advice and recipes that they received between 1648 and 1654.²⁷³ The fact that the scribe (most of the book is in the hand of Thomas Farr) mentions the names of William and Margaret alternatively attests to their mutual composition.²⁷⁴ A list of “Receipts given to my Lord Maquesse of Newcastle”, for instance, immediately follows a note on “My Lady Marquesse of Newcastelle Receipt to Cure a Fluxe or Dissentorye”.²⁷⁵ Revealing the importance of the vernacular to medical humanism, the entire book is in English.²⁷⁶ The Cavendishes evidently entreated their doctors to compose their epistles of advice and instruction in English, since Mayerne wrote to William that “you set mee too greate a taske in desiring my counsell for your infirmity in English of which language I dare not brag, and I doe not love to doe any thing that I cannot doe de bonne grace”.²⁷⁷ They would have requested these letters to be sent in their native tongue, however, so that Margaret could better delegate the composition of medicines to the family servants, since the keeping of medical books and the compounding of recipes typically fell under the umbrella of the woman’s domestic oeconomy.²⁷⁸ In any event, their medical book

²⁷² *Letters and Poems*, 65.

²⁷³ See Trevor-Roper, *Europe’s Physician: The Various Life of Sir Theodore de Mayerne* (2006), 343, 356-7, and 418-9.

²⁷⁴ For another case of a husband and wife collaborating on a medical book, see Mary and John Evelyn’s book in BL, Add. MS 78337. Some of this manuscript has been printed in *John Evelyn, Cook: the Manuscript Receipt Book of John Evelyn*, ed. by Driver (1997). Also see Hunter, *Science and the Shape of Orthodoxy: Intellectual Change in Late Seventeenth-Century Britain* (1989), 72-4.

²⁷⁵ See NUL, MS Pw V 90, ff. 63r-64v.

²⁷⁶ On medicine and the vernacular, see Slack, “Mirrors of Health and Treasures of Poor Men: The Uses of the Vernacular Medical Literature of Tudor England” (1979) and Fissel, “Readers, Texts, and Contexts: Vernacular Medical Works in Early Modern England” (1992).

²⁷⁷ NUL, Pw V 90, ff. 109v.

²⁷⁸ On the division of moral philosophy along gendered lines, see Maclean, *Renaissance Notion of Woman*, 47-67. On medicine and the household in particular, see Wear, *Knowledge and Practice in English*

includes many epistles of advice from Mayerne to both William and Margaret together with the transcription of a correspondence between William and Digby on the recipes of the Duke of Northumberland.²⁷⁹ Along with attesting to how Cavendish came to mix chymical and Galenic medicine in *Philosophicall Fancies*, this book highlights the centrality of medical discussions to seventeenth-century courtly life.²⁸⁰

While Cavendish's engagement with the likes of Mayerne and Digby provided the foundation for her understanding of the medical traditions, it was her conversations with Charleton that spurred her to publish *Philosophicall Fancies*. Returning to England from Antwerp in November 1651, she first consulted Charleton due to poor health. As rehearsed in a letter to Cavendish from 1655, Charleton had the "Honour and Pleasure of sometimes attending you, and hearing your more than ingenious Discourses" from late 1651 onwards.²⁸¹ Charleton's medical activities in the period preceding his treatment of Cavendish enable us to infer the content of these discussions. Even as a pupil of John Wilkins at Magdalen Hall, Oxford, Charleton associated with the Harveian circle at Merton College.²⁸² Striving daily "to confirm and advance that incomparable invention of

Medicine, 1550-1680 (2000), 49-55; Hunter, "Women and Domestic Medicine: Lady Experimenters, 1570-1620" (1997); Pollock, *With Faith and Physic: The Life of Tudor Gentlewoman Lady Grace Mildmay, 1552-1620* (1993); Cooper, "Homes and Households" (2006); and Spiller, *Seventeenth-Century English Recipe Books: Cooking, Physic, and Chirurgery in the Works of W.M. and Queen Henrietta Maria, and of Mary Tillinghast* (2008).

²⁷⁹ For Mayerne's advice, especially see NUL, Pw V 90, ff. 14r-21r, ff. 25r-28v, and 29r-31r. For that of Digby, see NUL, Pw V 90, ff. 46r-53r. On Digby and chymistry, see Betty Dobbs' three-part study: "Studies in the Natural Philosophy of Sir Kenelm Digby. Part I" (1971); "Studies in the Natural Philosophy of Sir Kenelm Digby. Part II. Digby and Alchemy" (1973); and "Studies in the Natural Philosophy of Sir Kenelm Digby. Part III. Digby's Experimental Alchemy – The Book of *Secrets*" (1974). On Digby more generally, see Henry, "Sir Kenelm Digby, Recusant Philosopher" (2010) and Moshenska, *A Stain in the Blood: The Remarkable Voyage of Sir Kenelm Digby, Pirate and Poet, Courtier and Cook, King's Servant and Traitor's Son* (2016).

²⁸⁰ I will use "chymistry" with a "y" throughout rather than "alchemy" or "chemistry". For an explanation of this practice, see Newman and Principe, "Alchemy vs. Chemistry: the Etymological Origins of a Historiographic Mistake" (1998).

²⁸¹ *Letters and Poems*, 145.

²⁸² Webster, "The College of Physicians: 'Solomon's House' in Commonwealth England" (1967).

Doctor *Harvey*, the *Circulation of the Blood*’, Charleton was one of the physicians who garnished support for Havey’s hypothesis amongst the medical community.²⁸³

Immediately before treating Cavendish, Charleton was also engaging with the works of Jan Baptista van Helmont, and in 1650 this concern yielded three publications. The first was *Spiritus Gorgonicus*, which provides Helmontian explanations for the causes and cures of “the stone”, appealing to the universal stone-forming spirit. He then published two translations: *A Ternary of Paradoxes* and *Deliramenta Catarrhi*. Since these were the first English translations of van Helmont’s works, they drew attention to Charleton as his English spokesman.²⁸⁴ Cavendish’s later *Philosophical Letters* critiques van Helmont directly, extensively quoting from and footnoting John Chandler’s 1662 translation of *Ortus medicinae. Philosophicall Fancies*, however, sits somewhere between the poetic natural philosophy of *Poems, and Fancies* and her later, overtly critical philosophical pieces. Written in verse and prose, the generic fluidity of *Philosophicall Fancies* allows Cavendish to extract from, compound, and “naturalise” the ideas of various thinkers before critiquing many of the same figures in her subsequent publications. As Charleton put it in a later letter to Cavendish: “Your Collections by the improvement they receive from your fertile Brain, become your own Production: and those obscure Hints delivered to you in the Discourses of others, by passing through your lightsome Imagination, are

²⁸³ Charleton, *The Immortality of the Human Soul, demonstrated by the light of nature: in two dialogues* (London, 1657), 35. On Harvey and his followers, see Frank, *Harvey and the Oxford physiologists: A Study of Scientific Ideas* (1980) and French, *William Harvey’s Natural Philosophy*, 114-49.

²⁸⁴ See the Latin poem by Clement Barksdale that prefaces Charleton’s *Darknes of Atheism*: “*Charltonus is, qui Helmontium pridem dedit, / Nuperque nobis reddidit Helmontium*” (*The Darknes of Atheism Dispelled by the Light of Nature: A Physico-Theologicall Treatise* (London, 1652), D1v). More generally, see Clericuzio, “From van Helmont to Boyle: A study of the transmission of Helmontian chemical and medical theories in seventeenth-century England” (1993) and Gelbart, “The Intellectual Development of Walter Charleton” (1971).

turned into bright and full Discoveries”.²⁸⁵ Through her collection and extraction from Harvey and van Helmont, we will see that Cavendish developed a notion of vital spirits and animal life that has deep affinities with Francis Glisson’s so-called “hylozoism”. In conclusion, this chapter turns to an unstudied commonplace book by Nehemiah Grew that reveals an interest in Cavendish’s medical reflections into the eighteenth century.

2.1. Transference and Transformation: René Descartes

In *Philosophical and Physical Opinions*, Cavendish demarcates the discourse in which she has been working by writing that the “matter I call the rational and sensitive spirits, [is that] which others call the animal, and vital spirits”.²⁸⁶ While she was probably not reading Galen in Latin, this suggests that Cavendish’s substance theory was rooted in the Galenic physiology that was taught in all European universities and practised by most learned physicians during the mid-seventeenth century.²⁸⁷ By this time, numerous works by Galen had been translated into English—ranging from Thomas Gale’s 1585 *Certaine workes of Galens called methodus medendi* to Nicholas Culpeper’s 1652 *Galen’s art of physick*—but we will see throughout this study that Galenic ideas were also disseminated through private medical treatment, conversations, and texts that were not explicitly translations of Galen. In an epistle defending Margaret against claims that she could not have written her early publications because she lacked a formal education, William Cavendish thus writes that “the termes of Physicians” she deploys “are so plain and so

²⁸⁵ *Letters and Poems*, 92.

²⁸⁶ *PPO*, 138.

²⁸⁷ See Frank, “Medicine” (1997) and Webster, *The Great Instauration*, especially 15-22 and 308-14. Cf. Temkin, *Galenism: The Rise and Decline of a Medical Philosophy* (1973) and O’Malley, “Medical Education During the Renaissance” (1970).

common, as none needs to construe Greek in *Hippocrates* or *Galen* for them”.²⁸⁸

According to Galen, *spiritus vitales* or vital spirits, carry heat and vitality through the body, and *pneuma psychikon*, or animal spirits, transfer this vitality into the psychic activity that transmits the higher functions of the soul through the nerves.²⁸⁹ Suiting them to her English discourse, Cavendish calls *spiritus vitales* “sensitive spirits” and *pneuma psychikon* “rational spirits”. As we will see, Cavendish considered the usual language of “vital” and “animal” spirits to be misleading, since she held that all spirits are vital and not restricted to animal bodies.

For his part, Descartes declares at the outset of *The Passions of the Soule* that he has been “forced to write in such a sort, as if I treated of a matter never before handled”, for “nothing more clearly evinces the Learning which we receive from the Ancients to be defective, than what they have written concerning the Passions”.²⁹⁰ Despite his censure, “animal spirits” also figure prominently in Descartes’ physiology.²⁹¹ Both Cavendish and Descartes modified Galenic spirits to address a difficulty that Aristotle’s tripartite soul faced. For Aristotle, the vegetative soul accounts for the nutrition and reproduction of plants, the sensitive soul enables animals to perceive and respond to their environments, and the rational soul gives rise to human intellection.²⁹² But neither Descartes nor Cavendish could grasp how the various parts of the soul interact within animals and

²⁸⁸ *PPO*, A2r.

²⁸⁹ See Galen, *On the Natural Faculties*, trans. by Brock (1916), II.vi.98 and “Introduction”, xxxiv-v. Also see Temkin, *Double Face of Janus and Other Essays in the History of Medicine* (1977), 154-61.

²⁹⁰ Descartes, *The Passions of the Soule* (London, 1650), 1. This chapter cites the 1650 version of *Passions*, but Descartes’ other works are cited in the modern English translation: *The Philosophical Writings of Descartes*, Vol. 1-3, trans. by Cottingham, Stoothoff, and Murdoch (1984). This is because the specific terminology of the text Cavendish read is significant, whereas her early knowledge of Descartes’ other works is largely oral.

²⁹¹ In addition to Des Chene’s *Physiologia*, *Life Form*, and *Spirits and Clocks*, see Ariew, *Descartes and the Last Scholastics* (1999) and *The Rise of Modern Philosophy: The Tension Between the New and Traditional Philosophies from Machiavelli to Leibniz*, ed. by Sorell (1993), especially chapters 7, 8, and 13.

²⁹² See Serjeantson, “The Soul”; Park, “The Organic Soul” (1988); Nussbaum and Rorty, *Essays on Aristotle’s De Anima* (1992); and Johansen, *The Power of Aristotle’s Soul* (2012).

humans. Descartes famously approached this impasse by reducing Aristotle's tripartite soul to a single, immaterial soul or mind that was restricted to humankind.²⁹³ In marked contrast to Descartes' recourse to incorporeal singularity, Cavendish accounted for all mental and physical processes by referring to the interactions between material spirits. Distancing herself from the notion in *Poems, and Fancies* that "All pointed *Atomes* to *Life* do tend", she argues in *Philosophicall Fancies* that "*Life* is the *Extract*, or *Spirit* of *Common Matter*: This *Extract* is Agile, being alwayes in motion".²⁹⁴ Cavendish's emphasis on the intricate manoeuvres of material spirits could be juxtaposed against Descartes' early dualistic distinction between the immateriality of the thinking, human mind and the body's mechanical functions. Yet, after Elisabeth of Bohemia underscored his inability to explain the relationship between the body and mind, he revised his physiology in *Les passions de l'âme*.²⁹⁵ In a section of *Passions* on "How the Soul and the Body act one against another", Descartes writes that

the Soul holds her principall seat in that little kernell in the midst of the brain, from whence she diffuseth her becomings into all the rest of the body by intercourse of the spirits, nerves, yea and the very blood, which participating the Impressions of the spirits, may convey them through the arteries into all the members.²⁹⁶

Animal spirits, then, carry information from the immaterial soul in the pineal gland, through the blood and nerves, to the body. In this way, they perform a crucial role in Descartes' union of the active incorporeal soul with inert bodily matter.²⁹⁷

While both Cavendish and Descartes conferred upon their spirits a cardinal role in

²⁹³ For a useful overview, see Fowler, *Descartes on the Human Soul: Philosophy and the Demands of Christian Doctrine* (1999), 161-86.

²⁹⁴ *Poems, and Fancies*, 14 and *Philosophicall Fancies*, 15.

²⁹⁵ On Elisabeth of Bohemia and Descartes, see Shapiro, "Princess Elizabeth and Descartes: The Union of Soul and Body and the Practice of Philosophy" (1999) and Hutton, "Women Philosophers and the Early Reception of Descartes: Anne Conway and Princess Elisabeth" (2005).

²⁹⁶ *The Passions of the Soule*, 28.

²⁹⁷ See Smith, "Spirits as Intermediary in Post-Cartesian Natural Philosophy" (2008).

animal psychology and physiology, the specific functions they ascribed to them differ notably. According to Descartes, the soul is located in the pineal gland because this is the only singular part of the brain. The body (with its doubled eyes and ears) can be duplicitous, and animal spirits deliver numerous messages simultaneously, but the soul's singularity counteracts the faults arising from the body's material multiplicity.²⁹⁸

Responding to Descartes, Cavendish expresses her inability to “apprehend that the Mind's or Soul's seat should be in the Glandula or kernel of the Brain, and there sit like a Spider in a Cobweb, to whom the least motion of the Cobweb gives intelligence of a Flye”.²⁹⁹ She rather held that no principle beyond their materiality unifies her spirits, meaning that rationality and sensitivity are diffused throughout the body. In

Philosophicall Fancies, Cavendish maintained that there is one substance in the natural world that was subdivided into rational, sensitive, and dull matter. Relaying the functions of her spirits, she contends that “Spirits of Sense, move of themselves: for the dull part of Matter moves not, but as it is moved thereby”.³⁰⁰ Cavendish accordingly conceived of dull matter as a base from which spirits proceed, and, in turn, use their vitality to move.

We saw in the last chapter that the atomic philosophy commonly mediated between vital and mechanical metaphors, but in *Philosophicall Fancies* Cavendish explicitly appeals to dull matter. In doing so, she engages with Descartes' famous “first law of nature” in *Principia Philosophiæ* that “each and every thing, in so far as it can, always continues in the same state; and thus what is once in motion always continues to move”.³⁰¹ With this formulation of the law of inertia, Descartes rejected the Scholastic

²⁹⁸ Gobert, *The Mind/body Stage: Passion and Interaction in the Cartesian Theatre* (2013), 24.

²⁹⁹ *Philosophical Letters*, 111.

³⁰⁰ *Philosophicall Fancies*, 16.

³⁰¹ Vol. 1, 240.

view that motion is the process of passing from one state to another instead of a state itself.³⁰² Translating Galenic physiology into a mechanistic idiom, Descartes explained that “the machine of our body is so composed, that all the changes befalling the motion of the spirits may so worke as to open some pores of the braine more than others”.³⁰³ By distinguishing between sensitive and dull matter, Cavendish also created a dichotomy between motion and rest. Yet she applied this notion to dissimilar ends by claiming that sensitive matter incessantly moves inert matter, since “Idlenesse is against the *Nature of Life*, being a perpetuall *Motion*”.³⁰⁴ Rather than arguing that dull matter is in constant motion because it is unable to change states, she held that sensitive spirits alter the states of dull matter incessantly. Against Descartes’ belief that the mechanical motions of the body propel passive spirits, Cavendish contended that vital spirits are the sole source of bodily activity. She disregarded Aristotle’s organic soul only to assign similar active “qualities”, “natures”, and “principles” to matter itself by accentuating the energetic qualities of Galenic spirits.³⁰⁵

Although inert animal spirits connect the body and soul, Descartes retained a difference in kind between sensation and rationality. By contrast, Cavendish aligned sensitive and rational spirits by referring to them both as “subtle” or “innated” matter. In doing so, she again used Descartes’ ideas against him, since he identified “subtle matter” with animal spirits.³⁰⁶ What is more, Cavendish delineated the functions of innated matter on surprisingly Cartesian lines. She writes that rationality emerges from the motion of

³⁰² Garber, “Descartes’ Physics” (1992), 315.

³⁰³ *The Passions of the Soule*, 15. Also see Hatfield, “Descartes’ Physiology and its Relation to his Psychology” (1992), 341.

³⁰⁴ *Philosophicall Fancies*, 23.

³⁰⁵ On Aristotle and the soul’s vital heat, see Freudenthal, *Aristotle’s Theory of Material Substance: Heat and Pneuma, Form and Soul* (1999), especially 7-73.

³⁰⁶ Vol. 1, 330.

“*Rationall Spirits*, as I may call them, [that] worke not upon *dull Matter*, as the *Sensitive Spirits* do; but only move in measure, and number, which make *Figures*; which *Figures* are *Thoughts*, as *Memory*, *Understanding*, *Imaginations*, or *Fancy*, and *Remembrance* and *Will*”.³⁰⁷ Whereas sensitive spirits move dull matter in the creation of bodies and perform the preponderant role in providing external sensory information, rational spirits are associated with cognition. As a result of this, “All the *Externall Motion* in a *Figure*, is, by the *Sensitive Spirits*; and all the *Internall*, by the *Rationall Spirits*”.³⁰⁸ Grounded in an external/internal distinction, Cavendish adheres to a body/mind duality of sorts.

Far from establishing a strict hierarchy, however, Cavendish’s spirits create a fluid and dynamic relationship between bodily and mental operations. Accounting for their interaction, she writes that “the *Rational Spirits* intermix” as the sensitive spirits move “through the Organs of the *Body*, especially the *Eyes*, and *Eares*, which are the common doors, which let the *Spirits* out, and in”.³⁰⁹ It is this kinship that allows for the manipulation and rational ordering of images that are necessary for imagination and recollection. Moving from these speculations to more exact physiological explanations, Cavendish postulates that sensitive spirits and rational spirits both “seem most to delight in Spungy, Soft, and liquid Matter; as in the Blood, Brain, Nerves”.³¹⁰ She also reckons that rational spirits enter the body externally, arguing that “If the rationall Spirits should enter into a Figure newly created, altogether, and not by degrees, a Childe (for example) would have as much *understanding* and *knowledge* in the *Womb*, or when it is *new-borne*,

³⁰⁷ *Philosophicall Fancies*, 30.

³⁰⁸ *Philosophicall Fancies*, 37. On this distinction, see Michaelian, “Margaret Cavendish’s Epistemology” (2009).

³⁰⁹ *Philosophicall Fancies*, 35.

³¹⁰ *Philosophicall Fancies*, 49.

as when it is enlarged and fully grown”.³¹¹ A critical mass of rational spirits exist in each human being at the time of birth—which creates continuity in reason and behaviour—but more spirits enter humans over time. Cavendish’s material duality and her transformation of animal spirits and inert matter enabled her to respond to Descartes’ substance dualism on its own terms. But, despite the plethora of literature following Gallagher’s reading of Cavendish as an absolute female subject, her physiology plainly resists the idea of a stable and self-sufficient *cogito*.³¹² Just as Cavendish constantly altered her thought and stamped her wide-ranging works with an individual character through a process of compilation, she saw human beings as historical subjects that change over time due to a multiplicity of unstable spirits.³¹³

The disparate ways that Cavendish and Descartes complicated Aristotle’s tripartite soul also led them to notably diverge in their notions of the relationship between human beings and other animals.³¹⁴ The pertinent concept here is the *scala naturae* (or the great chain of being), which Plato initially devised as a hierarchical ordering of reality that moved from God to the Forms to man and down through the lower animals until it eventually arrived at matter itself.³¹⁵ Inverting this Platonic structure, Aristotle argued in

³¹¹ *Philosophicall Fancies*, 47.

³¹² See Gallagher, “Embracing the Absolute” and footnote 7 in the introduction. Susan Sherman has challenged the discourse of Cavendish’s singularity from a very different angle: see “Trembling Texts: Margaret Cavendish and the Dialectic of Authorship” (1994).

³¹³ On the passions and the fluidity of the self, see Tilmouth, “Passion and Intersubjectivity in Early Modern Literature” (2013) and Reiss, *Mirages of the Self: Patterns of Personhood in Ancient and Early Modern Europe* (2003), especially 469-518.

³¹⁴ There is now a large body of literature on early modern animals, but emphasis remains on social, cultural, and political attitudes rather than ideas: see Boas, *The Happy Beast in French Thought of the Seventeenth Century* (1933); Thomas, *Man and the Natural World: Changing Attitudes in England, 1500-1800* (1983); Fudge, *Perceiving Animals: Humans and Beasts in Early Modern English Culture* (2000); Shannon, *The Accommodated Animals: Cosmopolity in Shakespearean Locales* (2013); Raber, *Animal Bodies, Renaissance Culture* (2013); and Boehrer, *Nonhuman Beings in Early Modern Literature* (2010).

³¹⁵ The classic source on the *scala naturae* is Lovejoy, *The Great Chain of Being: A Study of the History of an Idea* (1936). Also see Wolff, *Die goldene Kette: Die Aurea Catena Homeri in der englischen Literatur von Chaucer bis Wordsworth* (1947); Kuntz and Kuntz, *Jacob’s Ladder and the Tree of Life: Concepts of*

his *History of Animals* that “Nature proceeds little by little from things lifeless to animal life in such a way that it is impossible to determine the exact line of demarcation”.³¹⁶ As we will see in the next chapter, the material realm of physics and the immaterial sphere of metaphysics were segregated in the Aristotelian tradition upon which Cavendish increasingly relied. This empowered Aristotle to formulate a truly “natural” *scala naturae*, rather than heightening humankind’s rapport with the divine. In holding that all animals are composed of inert matter—yet furnishing humans with an incorporeal and rational soul—Descartes accentuated the split between physics and metaphysics. But he placed humans on the other side of Aristotle’s divide, with the immaterial.³¹⁷

That Cavendish was aware of Descartes’ ideas on animals from an early period can be inferred from a letter that Descartes penned for William Cavendish during November 1647, in which he states that he “cannot share the opinion of Montaigne and others who attribute understanding or thought to animals”. Providing the master horseman with a protracted justification, he goes on to write regarding

the movements of our passions, even though in us they are accompanied by thought because we have the faculty of thinking, it is nevertheless very clear that they do not depend on thought, because they often occur in spite of us. Consequently they can also occur in animals, even more violently than they do in human beings, without our being able to conclude from that that animals have thoughts.³¹⁸

In *Passions* he revises and parses out this position in more explicitly physiological terms, explaining that although animals “have no reason, nor it may be any thought, all the

Hierarchy and the Great Chain of Being (1987); Wolfe, “Spenser, Homer, and the Mythography of Strife” (2005); and Lewis, “Introduction”, *William Petty on the Order of Nature: An Unpublished Manuscript Treatise* (2012).

³¹⁶ Aristotle, *History of Animals*, 558b.

³¹⁷ See Harrison, “Descartes on Animals” (1992); Snider, “Cartesian Bodies” (2000); Cottingham, “A Brute to the Brutes?: Descartes’ Treatment of Animals” (1978); and Gontier, *De l’homme à l’animal: Montaigne et Descartes, ou, Les paradoxes de la philosophie moderne sur la nature des animaux* (1998), especially 232-45.

³¹⁸ Vol. 3, 302-4.

motions of the spirits and the kernell, which excite Passions in us, yet are in them, and serve to foment and fortifie (not as in us the Passions, but) the motions of the nerves, and muscles their concomitants”.³¹⁹ In this passage, Descartes escalates a line of ancient thought that deemed animals incapable of language or rationality but endorsed their expression of passions.³²⁰ Considering passions to be apprehensions and emotions that overtake animals, he had to distinguish the animal spirits that goaded them from the intellectual activities of humans in order to circumvent the possibility that the spirits producing the sometimes-unruly passions could hinder the attainment of certain knowledge.³²¹ By contrast, arguing that all plants, animals, and minerals are composed of the same matter, Cavendish challenged the very prospect of differentiating between “things lifeless” and “animal life”. As she puts it, “all things have sense, because all things have of these *Spirits* in them; and if *Sensitive Spirits*, why not *rationall Spirits*?”.³²² While she deploys a rhetorical question here, Cavendish makes it plain over the course of *Philosophicall Fancies* that all animals are endowed with sentience and intelligence, though all species may not feel and reason in precisely the same manner.

Cavendish’s physiological discussion of animals in *Philosophicall Fancies* grew out of her literary representations in *Poems, and Fancies*. In this respect, her satirisation of classical hunting myths (such as that of Orion) in “The Hunting of the Hare” and “The Hunting of the Stag” is especially significant. Scholars have previously read these poems as political allegories, but there is good reason to believe that Cavendish was chiefly

³¹⁹ *The Passions of the Soule*, 44.

³²⁰ See Serjeantson, “The Passions and Animal Language, 1540-1700” (2001); Harrison “Reading the Passions: The Fall, The Passions, and Dominion over Nature” (1998); and Demonet, *Les Voix du signe: Nature et origine du langage à la Renaissance (1480-1580)* (2008).

³²¹ See *The Passions of the Soule*, 16.

³²² *Philosophicall Fancies*, 54.

concerned with their manifest content.³²³ We saw in the last chapter that she drew many ideas from Book XV of Ovid's *Metamorphoses*, and in these poems she synthesises Ovid's hunting myths with the ethical orientation of Pythagoras, who "exclaimed against the killing, much more detested the eating of any" animal.³²⁴ Echoing Pythagoras's indignity "That entrails bleeding entrails should intomb", Cavendish decries men who make "their *Stomacks, Graves*, which full they fill / With *Murther'd Bodios*, that in sport they kill".³²⁵ Reaching the crescendo of her disdain for human self-elevation in the last lines of "The Hunting of the Hare", she writes:

Yet *Man* doth think himselfe so gentle, mild,
When *he* of *Creatures* is most cruell wild.
And is so Proud, think onely he shall live,
That *God* a *God-like Nature* did him give.
And that all *Creatures* for his sake alone,
Was made for him, to Tyrannize upon.³²⁶

Cavendish increasingly grappled with theological questions, but this is a rare reference to a single, creator God in her early works. We can make sense of this appeal, however, if she is responding to Descartes' dualistic belief that humans, as essentially immaterial souls, are closer to God than other animals, or that God gave humans a God-like nature.

In her sympathetic representation of Wat, the hare, Cavendish asserts that he "Thinkes" and describes him as "wise": "His *Head* he alwaies sets against the *Wind*; / If turne his *Taile* his *Haires* blow up behind: / Which *he* too cold will grow, but *he* is wise, / And keepes his *Coat* still downe, so warm *he* lies".³²⁷ Seventeenth-century thinkers commonly saw wisdom as a tool that enables humans to adapt their actions to fit different

³²³ *Poems, and Fancies*, 110. See Carson, "The Hunted Stag and the Beheaded King" (2005) and Suzuki, "Animals and the Political in Lucy Hutchinson and Margaret Cavendish" (2015).

³²⁴ *Ovid's Metamorphosis*, 513.

³²⁵ *Ovid's Metamorphosis*, 493 and *Poems, and Fancies*, 112.

³²⁶ *Poems, and Fancies*, 112-13.

³²⁷ *Poems, and Fancies*, 110.

environments and situations, and here Cavendish amplifies the ancient view that human shared this faculty with other animals.³²⁸ Affiliated with wisdom, the passions were conceived of as emotional states that allowed all animals to assess their present risks and opportunities. Cavendish's language of "thought" and "wisdom" when discussing Wat intimates that animals have the capacity to channel their passions towards useful ends.³²⁹ Using Galenic humoral language to supply a physiological explanation in an essay titled "Of Passions", she thus writes that "The Passions of the Mind, are like the Humours of the Body; for all Bodies have Choler, Melancholy, and Flegm, nor could it be nourished without them; so the Mind hath many Passions, which without would be like a Stone".³³⁰

It is Cavendish's sympathy towards Wat in *Poems, and Fancies* that guides her to form a physiological outlook that accounts for what she perceives as the capacity of animals to direct their passions.³³¹ We saw in the last chapter that the concept of "sympathy" was traditionally conceived of as an "occult quality", rooted in the ideas of Aristotle and Galen. Already in *Poems, and Fancies*, Cavendish doubted that size, shape, and weight could adequately explain all occult qualities. Developing her substance theory in *Philosophicall Fancies*, she argues that "All things in the World have an *Operative power*; which *Operation* is made by *Sympatheticall Motions*, and *Antipathetical Motions*, in severall *Figures*".³³² Largely due to the gradual dissipation of traditional ideas regarding occult qualities, "sympathy" shifted from a physiological to a moral discourse over the course of the seventeenth century. By the mid-seventeenth century, the term

³²⁸ On this as a general intellectual movement, see James, *Passion and Action: The Emotions in Seventeenth-Century Philosophy* (1997).

³²⁹ Tilmouth, "Passion and Intersubjectivity", 29.

³³⁰ *The World's Olio*, 144.

³³¹ *Poems, and Fancies*, 12.

³³² *Philosophicall Fancies*, 13.

sympathy frequently designated “the quality or state of being affected by the condition of another with a feeling similar or corresponding to that of the other”, normally with reference to being affected by another’s suffering.³³³ In *Philosophical Letters*, Cavendish describes sympathetic relations in observable terms, as “nothing else but ordinary Passions and Appetites amongst several Creatures, which Passions are made by the rational animate Matter, and the Appetites by the sensitive”.³³⁴ Interestingly overlaid with the motion of rational spirits, here “sympathy” is closely related to the passions and interactions between “several Creatures”.

Humans not only experience sympathy towards animals, but “Antipathy, or Sympathies” exist between “all Animals”.³³⁵ Not using sympathy in a straightforwardly moral sense in her discussion of animals, Cavendish even surmised that sympathetic relations lead different species to kill each other for subsistence, writing that “when some *Figures* destroy others, it is for the maintenance or security of themselves: and when the *Destruction* is, for Food, it is *Sympatheticall Motion*, which makes a particular Appetite, or nourishment from some *Creatures* to others; but an *Antipatheticall Motion*, that makes the *Destruction*”.³³⁶ Sympathetic spirits accordingly tend towards life, but, for precisely this reason, their equal and opposite motions compel them to kill. For Cavendish, only humans outstrip natural sympathy by killing animals for sport and gluttony rather than survival. Grounding her philosophy in the sympathetic relations between material spirits, she used linguistic entanglements to draw out the physiological basis of moral

³³³ *OED*, “Sympathy”, n. 3b and c. See Lobis, *The Virtue of Sympathy*, especially 69-109. But the interpretation offered here diverges from Lobis’ notion of Cavendish’s “egoistic sociability”, based on his socio-political reading of *Sociable Letters*. For some important correctives to Lobis’s account, see Moyer, “Sympathy in the Renaissance” (2015).

³³⁴ *Philosophical Letters*, 70.

³³⁵ *PPO*, 40.

³³⁶ *Philosophicall Fancies*, 14.

philosophy. In keeping with her moral orientation, Cavendish argued that animals experience thoughts and emotions, while also discussing the physiological role that the sympathetic relations of material spirits perform in animal bodies.³³⁷

Because Cavendish determined that sensitive and rational material spirits put animals into motions, she did not even denounce the passions as entirely irrational forces. Far from it, she maintains that “Whatsoever hath an *innate motion*, hath *Knowledge*; and what *matter* soever hath this *innate motion*, is *knowing*: But according to the severall motions, are severall knowledges made; for *Knowledge* lives in *motion*, as motion lives in *matter*”.³³⁸ Cavendish reasons that if matter can move, it must know how to move, creating a matter-motion-knowledge triad. Whereas Descartes’ immaterial soul supplies an ontological grounding for his epistemology, Cavendish collapses this distinction. Since the same matter both begets thoughts and allows for the natural world to function, studying the motion of spirits supplies insights into the cognitive processes of humans, and understanding thought processes allows for a richer vision of the natural world. Cavendish frequently expresses the symbiotic relationship between existence and knowledge with antimetaboles, using “the *Spirits of life*, or *lively Spirits*” and the “*Spirits of Knowledge*, or the *Knowledge of Spirits*” interchangeably.³³⁹ In tension with the Cartesian notion that there is no knowledge without self-knowledge, Cavendish argued that human intelligence emerges from the non-conscious knowledge of the material spirits that pervade the natural world.

Regarding the general motions of spirits, Cavendish relied on the four auxiliary capacities of Galen’s *facultas naturalis* to claim that sensitive spirits move in attractive,

³³⁷ *Philosophicall Fancies*, 36.

³³⁸ *Philosophicall Fancies*, 52.

³³⁹ *Philosophicall Fancies*, 19 and 44.

retentive, digestive, and expulsive motions.³⁴⁰ Mapping these onto the language of observable phenomena, she writes that “*Attractive* is that which we call *Growth*, or *Youth*. *Retentive*, is that we call *Strength*. *Digestive* is that we call *Health*, that is an equall distribution of Parts to Parts, and agreeing of those Spirits. *Expulsive* is that which we call *Death*, or *Decay*”.³⁴¹ The knowledge of sensitive spirits is confined to a spectrum, making a limited apprehension of how the natural world functions possible. Yet she proceeds to write that there “can be no *absolute Knowledge*, if *infinite degrees of Knowledge*; nor no *absolute power*, if there be *infinite degrees of strength*: nor *present*, if infinite degrees of *Motion*”.³⁴² The infinite quantity of particular motions and Cavendish’s anti-anthropocentric belief that rationality is inscribed in matter itself led her to advance the position that knowledge is infinite and suffused throughout the natural world. Power is inseparable from the natural knowledge of matter, which is infinite, and, for this reason, does not allow for the outer limit that absolutes require. Not only does Cavendish deny the existence of stable subjects, but she also repudiates the notion that there is absolute knowledge or power, at least in nature.

Cavendish’s conviction that there are no absolutes in the natural world led her to develop a probabilistic natural philosophy and physiology.³⁴³ This accords with the emphasis on probability rather than demonstration in the Galenic tradition, based as it

³⁴⁰ Debru, “Physiology” (2008), 274.

³⁴¹ *Philosophicall Fancies*, 16.

³⁴² *Philosophicall Fancies*, 5.

³⁴³ See Clucas, “Variation, Irregularity and Probabilism: Margaret Cavendish and Natural Philosophy as Rhetoric” (2003) and Boyle, “Margaret Cavendish on Perception, Self-Knowledge, and Probable Opinion” (2015). On early modern probability more generally, the most important study is Serjeantson, “Testimony and Proof in Early-Modern England” (1999). Also see Shapiro, *Probability and Certainty in Seventeenth-Century England: A Study of the Relationships between Natural Science, Religion, History, Law and Literature* (1983); van Leeuwen, *The Problem of Certainty in English Thought, 1630-1690* (1970); Hacking, *The Emergence of Probability: A Philosophical Study of Early Ideas about Probability, Induction and Statistical Inference* (1975); and Wiley, *The Subtle Knot: Creative Scepticism in Seventeenth-Century England* (1952).

was on the humours of individual patients.³⁴⁴ Moving away from the atomic figures and measured motions of *Poems, and Fancies*, Cavendish held in *Philosophicall Fancies* that the natural world undergoes continual changes because of the qualitative properties and motions of matter alone, some of which are volatile chymical elements. By contrast, Descartes argued that laws organise nature, and the material that sustains these laws is ultimately irrelevant.³⁴⁵ The former leaves space for variation and probability, whereas the latter is compatible with the postulation of universals and the corresponding mathematisation of the natural world. Considering matter to be infinite, Cavendish writes explicitly that in “*Nature* there is no such things, as *Number*, or *Quantity*; for *Number*, & *Quantity* have only reference to *division*”, and the infinite and eternal cannot be subject to such separations.³⁴⁶ In an ironic turn, Cavendish’s mathematical speculations on infinity in *Poems, and Fancies* led her to renounce quantities in the natural world. This stands in stark contrast to Descartes’ belief that extension and quantity are the only material things that exist definitely, enabling him to arrive at certain knowledge through the application of geometrical principles to the natural world.³⁴⁷

Of particular interest in this regard are Cavendish’s two sections on the void in *Philosophicall Fancies*: one titled “*There is no Vacuity*”, in which she denies the existence of a void, and another titled “*Of Vacuum*” that affirms its existence. A marginal note states that “The Readers may take either Opinion”.³⁴⁸ Such a presentation of competing positions foregrounds Cavendish’s readiness to countenance uncertainty even

³⁴⁴ See Maclean, *Logic, Signs, and Nature in the Renaissance: The Case of Learned Medicine* (2002), 290-330 and Boudon, “Art, science et conjecture chez Galien” (2003).

³⁴⁵ See Henry, “Metaphysics and the Origins of Modern Science: Descartes and the Importance of Laws of Nature” (2004).

³⁴⁶ *Philosophicall Fancies*, 4.

³⁴⁷ Vol. 2, 226-7. Also see Garber, *Descartes’ Metaphysical Physics* (1992), especially 263-306.

³⁴⁸ *Philosophicall Fancies*, 8-9.

regarding the basic constituents of the universe. What is more, Cavendish concedes that “because the Figures and motions of the infinite Spirits which they move, and make, are infinite, I cannot give a finall description”.³⁴⁹ While it is possible to identify the gamut of material motions, she believed that to account for the particular actions of spirits is an inexhaustible task. As her ambivalence towards the existence of the void implies, Cavendish’s spirits bridge her earlier atomism and her later theory of *minima naturalia*, which we will look at in the next chapter. Already in *Philosophicall Fancies*, Cavendish intimates that these are not her final words. Ending her work with a list of questions that deserve further attention, she determines that “*Fancy*, which is the effect of *Motion*, is as infinite as *Motion*; which made me despaire of a finall Conclusion of my *Booke*”.³⁵⁰ Not mere listlessness, this despair is an active passion that should further stimulate the reader’s curiosity regarding Cavendish’s unsettled fancies.

In reading Descartes, Cavendish was orientated by her open-ended approach to the book of nature. Supplying an insight into her reading practice in *Philosophical Letters*, Cavendish admits that when she read “the works of that Famous and most Renowned Author, Des Cartes”, she would “pick out onely those discourses which I like best, and not to examine his opinions, as they go along from the beginning to the end of his books”. She also records in a proem that those “Authors whose opinions I mention, I have read, as I found them printed, in my native Language, except *Des Cartes*, who being in Latine, I had some few places translated to me out of his works”.³⁵¹ Not only was her reading intermittent and non-linear, but *Philosophical Letters* chiefly critiques *Principia Philosophiæ*, which had not yet been translated into English. While she was surely aware

³⁴⁹ *Philosophicall Fancies*, 40.

³⁵⁰ *Philosophicall Fancies*, 72-7.

³⁵¹ *Philosophical Letters*, 97 and B2v.

of Descartes' laws, Cavendish refrained from following the analytic deductions of *Principia* systematically. The other piece that she criticises, Descartes' *Meditationes*, progresses synthetically. Even then, Descartes claimed that his readers would only arrive at his apodictic conclusions if they followed his linear, sceptical journey.

For Cavendish, Descartes' systematic scepticism was apt "to strangle, not onely all opinions, but all knowledge".³⁵² Similarly, his scepticism served to establish absolutes that discouraged him from making meaningful revisions to his outlook on the natural world. In the next part of this chapter, we will see that Cavendish considered the compounding of past ideas from numerous intellectual traditions to generate conclusions of greater probability. But the continuous concentration that is required to fully comprehend Descartes' deductions deters the reader from challenging the fundamentals of his thought by situating his ideas historically or comparing them with other texts. Cavendish's piecemeal reading paradoxically empowered her to better challenge Descartes than those who engage with him more attentively, entangling themselves in his laws or self-contained narratives. Unlike the laws of *Principia Philosophiæ* or the journey to certainty in *Meditationes*, *Passions* is loosely organised under broad headings, similar to *Philosophicall Fancies*. This is not surprising inasmuch as *Passions* presents a changing discourse with fewer foundations and a larger degree of ambiguity than his prior publications. *Passions* is a text that Cavendish need not labour through from front to back, but can pick up and derive ideas from as she sees fit. Akin to the way she read Descartes' other texts, the half of the book she read was most probably neither the beginning nor end but the scattered bits throughout that took her fancy. Whereas

³⁵² *The World's Olio*, 4. The standard study of Renaissance scepticism is Popkin, *The History of Scepticism from Erasmus to Descartes* (1960). For some necessary challenges, see Maclean, "The 'Sceptical Crisis' Reconsidered: Galen, Rational Medicine and the *Libertas Philosophandi*" (2006).

Cavendish explicitly critiques Descartes' earlier output in her later work, in *Philosophicall Fancies* she subtly manipulated his more multilayered *Passions*.

In the final appraisal, it may be objected that Cavendish's critique of Descartes must not be taken too seriously on the grounds that *Poems, and Fancies* and *Philosophicall Fancies*—as marked by their titles—are more fanciful than Descartes' systematic and mathematical works. Yet we saw in the last chapter that “fancy” was by no means a simple term of disparagement, and many of Descartes' early readers considered him to espouse a novel form of literary fiction. Recalling his youthful infatuation with Descartes, Christiaan Huygens recorded that

M. des Cartes had found the means of getting his conjectures and fictions accepted as truths. And to those who read his Principles of Philosophy much the same happened as to those who read novels that please and create the impression of being true stories. The novelty of the shapes of his little particles and of his vortices were a great attraction.³⁵³

Huygens—a probabilist who designed innovative approaches to games of chance—did not wholly reject the value of Descartes' ideas but rather resisted the notion that his seductive explanations of natural causes are indubitably true.³⁵⁴ Just as fictional tales or “novels” can have an internal logic that does not reflect reality, Huygens challenges the notion that Descartes' philosophy truly applies to the natural world.

³⁵³ Huygens, *Oeuvres complètes, publiées par la Société hollandaise des sciences*, Vol. 5 (1950), 403. Also see Rogers, “Descartes and the English”, 291–4. We saw last chapter that Cavendish and Constantijn Huygens were friends, and her acquaintance with Christiaan is suggested in a letter from 1660 in which she asks Constantijn to send “my sarvices to your daughter and your suns espeshally to your sun archimedes” (this letter is in a private collection but a photocopy exists in BL, RP 7617/1 and it is transcribed in N. Akkerman and M. Corporaal, “Mad Science Beyond Flattery”). Christiaan Huygens was a famous mathematician, and Cavendish is undoubtedly alluding to his mathematical abilities by comparing him to the famous Greek mathematician, Archimedes.

³⁵⁴ On Descartes and fiction, see Binoche and Dumouchel, *Passages par la Fiction: Expériences de Pensée et autres dispositifs fictionnels de Descartes à Madame de Staël* (2013); Leyenberger, “Métaphore, fiction et vérité chez Descartes” (1998); and Fichant, *Science et métaphysique dans Descartes et Leibniz* (1998).

A similar critique of Descartes is implicit in English and Latin letters that the Master and Fellows of St. John's College, Cambridge, wrote to thank Cavendish for her gift copies of "Epistles and Poems". Regarding Cavendish's philosophy, they state that it reveals "a clear and searching acuteness of Judgement, nothing forced, or Mysterious: All is plain and genuine, meer and natural Nature". They contrast this with those who "imagine her [Nature] to be in Whirlpools and Quick-sands, like another *Scylla* or *Charybdis*, and they find Her so now and then, in their shipwreck Credit and Reputation".³⁵⁵ Although St. John's did not receive *Philosophical Fancies*, this letter usefully elucidates the relationship between the fancies of Cavendish and Descartes.³⁵⁶ Here "whirlpools" alludes to the end of Descartes' second meditation, in which he feels as if he has "fallen unexpectedly into a deep whirlpool which tumbles me around so that I can neither stand on the bottom nor swim up to the top".³⁵⁷ This "whirlpool" is a metaphor for the feeling of being torn between Pyrrhonian doubt and a dawning certainty. But the later *Principia* uses "whirlpools" (or vortices) non-metaphorically to represent the motions that he supposedly knew to occur at the microcosmic level.³⁵⁸ As the fellows of St. John's suggest, Descartes' notions are products of the imagination, yet they are not probable fancies. For all his alleged novelty, these whirlpools recall the imaginative but extravagant and unnatural monsters of ancient mythology, "like another *Scylla* or *Charybdis*". Descartes' cosmology requires one to blindly assent to fancies that cannot be observed, based on "credit" and "reputation".³⁵⁹ In terms of their content, Cavendish's

³⁵⁵ *Letters and Poems*, 19.

³⁵⁶ On the reception of Descartes at Cambridge during the early 1650s, see Stewart, "'Fleshy books': Isaac Barrow and the orational critique of Cartesian natural philosophy" (2000). Barrow also brings forth "probable arguments or conjectures" against Descartes' "fictitious worlds" (72-3).

³⁵⁷ Vol. 2, 16.

³⁵⁸ Vol. 1, 260-1.

³⁵⁹ For a relevant discussion, see Serjeantson, "Testimony and Proof" and Dear, "*Totius in Verba*: Rhetoric

physiological and philosophical conjectures are mostly as plausible as Descartes' whirlpools and vortexes.

Because Cavendish held that both reason and fancy arose from the motions of material spirits and were fuelled by the passions, she could better handle probable fictions from an epistemic standpoint. While there is a tendency in Cavendish scholarship to polarise reason and fancy (often on gendered lines), this follows from Descartes' belief that intellection and volition, rather than sensation or imagination, are "pure" and incorporeal properties of the mind.³⁶⁰ Even in *Passions*, Descartes continues to consider the *fantasie* or the "corporeal imagination" that creates metaphors to function like a machine. His insistence on the limitations of mere machines, then, is incongruous with his emphasis on the power of the mechanical explanations that the imagination conjures. Descartes' metaphysics may be rooted in an immaterial reason, but his mechanical ideas are built upon the corporeal imagination. For this reason, many of Descartes' readers interpreted his laws as no less fictional than the devices that bring them to life.³⁶¹

Christiaan Huygens may refer to Descartes' fictions somewhat condescendingly, believing he had been coaxed by the ideas of his father's close friend as a youth. Yet fables played a substantial role in the development of Descartes' cosmology. In his *Meditationes* he relays an on-going project to describe, in an unlimited "imaginary" space, a "new world" that developed out of "a chaos as confused as any the poets could invent".³⁶² Descartes thus briefly situates his novel world within the discourse of ancient

and Authority in the Early Royal Society" (1985).

³⁶⁰ Cottingham, "Cartesian Dualism: Theology, Metaphysics, and Science" (1992), 241. For a relevant discussion, see Sawday, *Engines of the Imagination: Renaissance Culture and the Rise of the Machine* (2007).

³⁶¹ See Torero-Ibad, "Fictions of the World in Descartes' and Gassendi's Physics" (2011).

³⁶² Vol. 1, 132.

cosmological poetry that we looked at in the last chapter. Reticent towards presenting a Copernican creation after Galileo's condemnation, Descartes did not publish the companion pieces that were posthumously titled *Le Monde* and *L'Homme*. As their titles indicate, in these works Descartes represents the creation of a fictitious world according to his philosophical principles and describes the bodily functions of imaginary human beings. In a passage that reflects Cavendish's open-ended conclusion to *Philosophicall Fancies*, Descartes writes at end of his fifth chapter of in *Le Monde* that

Many other things remain for me to explain here, and I would myself be happy to add here several arguments to make my opinions more plausible. In order, however, to make the length of this discourse less boring for you, I want to wrap part of it in the cloak of a fable, in the course of which I hope that the truth will not fail to come out sufficiently.³⁶³

Descartes spends the remainder of the text developing this fable, and writes in a letter to Mersenne from 1630 that it gave him great delight and was constructed to please his reader.³⁶⁴ Because Descartes' regularly brought his philosophical ideas to life by packaging them as fictions, it can prove difficult to extricate his supposedly certain philosophical and physiological conclusions from his fictional musings. The hypothetical men that he develops in *L'Homme* are almost indistinguishable from the physiological explanation of actual bodies in the *Passions*, meaning there is little reason to differentiate the former fictions from the latter truths.

In her own piece of prose fiction, *The Blazing World*, Cavendish enacts a thought experiment in which she strives "to make a World according to *Des Cartes* Opinion". But in her attempt to fathom his "Aethereal Globules, and set them a moving by a strong and lively imagination, her mind became so dizzie with their extraordinary swift turning

³⁶³ Vol. 1, 90.

³⁶⁴ Vol. 3, 28.

round, that it almost put her into a swoon; for her thoughts, by their constant tottering, did so stagger, as if they had all been drunk”.³⁶⁵ As Cavendish’s imaginative (and satirical) endeavour to replicate Descartes’ unobservable world in her fictional text suggests, Cavendish and Descartes equally engaged with the fictive. But they approached their fictions from divergent orientations. Cavendish’s stress on the interplay between imagination and reason placed her in a hypothetical realm, where she was not compelled to label particular ideas whimsical “fictions” or certain “facts”. Conversely, Descartes designated every idea that fell short of his benchmarks for clarity and distinctness as fabulous, denying intermediaries between certain truths and downright fictions. Many seventeenth-century thinkers (including Cavendish) challenged Descartes’ principles by reading his “truths” as probable fictions. These could complicate and interact with the ideas of other thinkers in the process of producing a unique vision of the natural world and animal life.

2.2. Chymical Extractions: Walter Charleton, William Harvey, and Francis Glisson

When *Philosophicall Fancies* was reprinted as the first half of *Philosophical and Physical Opinions* in 1655, the part of the work that followed “An Epistle to All Learned Physicians” was principally intended as a practical companion to Cavendish’s more hypothetical and philosophical discussion of spirits.³⁶⁶ Discussing her plans to publish this addition in *The World’s Olio*, Cavendish writes:

³⁶⁵ Cavendish, *The Description of a New World, Called The Blazing World* (1666), 100. Unless otherwise stated, all references for *The Blazing World* will be from the 1666 edition that was appended to *Observations Upon Experimental Philosophy*, which underscores the close relationship between literature and natural philosophy in Cavendish’s work.

³⁶⁶ *PPO*, 100.

I am about to publish an Additional Part, to joyn with my Book of Philosophical Fancies, which, by reason some part treats of Diseases, I recommend to Physicians; I mean not Empiricks, or Mountebanks, such as take the Name, and never studied the Science, whose Practice is rather to kill than to cure, which disgraceth that Noble Profession: But I mean those that are Studious and Learned, such as have been bred in the Famous Universities, and have received the Honour of Learning, as Batchellers and Masters of Art, or Doctors, by which Honourable Title they are allow'd to practice, as having arrived to the height of that Science.³⁶⁷

This passage is an unabashed apology for the learned physicians who were educated in Galenic medicine, and, as we will see more fully in later chapters, it follows from Cavendish's tenacious defence of the universities.³⁶⁸ Yet her praise of the medical profession also served a more specific rhetorical purpose: she wanted educated physicians to take her physiological reflections seriously, despite her lack of a university education. Obviously, it was not uncommon for amateurs, including Cavendish and Descartes, to discuss medical topics and even to disseminate their advice. Wanting William to know that he was keeping apace of philosophical and physiological trends on the continent, even the eloquent and highly educated Mayerne wrote on May 1649 (immediately after Descartes' publication of *Les passions de l'âme*) to tell William that his melancholia arose "accordinge as the Passions of the Soule (whereof the tymes furnish yo^u wth subject Enough) doe move yo^r Speritts, and Humours".³⁶⁹ Generally speaking, in the Cavendishes' medical book advice from the likes of Mayerne and Digby is placed adjacently. Mayerne's chief remedy is "The Salt of Steele or Anima Hepatis", while Digby dwells on the virtues of "the Powder of Vipers" at length, which he claims to make

³⁶⁷ *The World's Olio*, 200. Despite their interests in chymistry, this seems to have been a common sentiment among the Cavendish circle. In one of William's manuscripts there is an essay titled "Of Docter Emprick alias Mountebank" that reads: "Your art is Unsertyne, what then is your Skill? / Tis ~~for~~ to Gett Moneye; for your Medicins kill", (MS Pw V 25, ff. 142).

³⁶⁸ The best accounts of early modern medicine and its institutions are Siraisi, *History, Medicine, and the Traditions of Renaissance Learning* (2008); Cook, *The Decline of the Old Medical Regime in Stuart London* (1986); and Maclean, *Learned Medicine*.

³⁶⁹ MS Pw V 90, ff. 14r.

“y^e ouwarde semblance of People returne to a kinde of youthfulness”. As long as such chymical cures were circulating through spoken word, epistles, and manuscripts amongst courtly figures, rather than being sold in London for profit, amateurs were not seen as jeopardising the medical profession. But, as a woman publishing her medical reflections in English, Cavendish was toeing a fine line.³⁷⁰

In view of this fact, it was essential that she made inroads with learned medics. One such relationship that she sought to cultivate was with Charleton. It happens that Charleton was Mayerne’s junior assistant until 1650—or immediately prior to Cavendish’s return to England—and in all probability Mayerne recommended Cavendish to him.³⁷¹ In historiography, Charleton is not so much renowned for his medical contributions as his 1654 *Physiologia*, in which he translates and extends a part of Gassendi’s *Animadversiones*. Because of this, it has been argued that the atomism of *Poems, and Fancies* primarily depended on *Physiologia*.³⁷² But Charleton did not publish *Physiologia* until September 1654—over a year and a half after *Poems, and Fancies* appeared in print—and there is no evidence that a manuscript of *Physiologia* was in circulation.³⁷³ On the contrary, Charleton documents in his *Darknes of Atheism* of 1652 that “the late *Epidemick Dysentery*” confined him to the sickbed for much of the period directly before its publications, which means that he probably did not start *Physiologia*

³⁷⁰ On women acting as unlicensed physicians in the city, see Harkness, “A View from the Streets: Women and Medical Work in Elizabethan London” (2008).

³⁷¹ Sharp, “Walter Charleton’s Early Life”, 318-9.

³⁷² See Semler, “The Magnetic Attraction of Margaret Cavendish and Walter Charleton” (2011); Sarasohn, *The Natural Philosophy of Margaret Cavendish*, 46-49 and 57-75; Cottagnies, “Le ‘renouveau’ de l’épicurisme en Angleterre au milieu du dix-septième siècle de Walter Charleton à Margaret Cavendish – une Histoire Franco-britannique” (2008); Lewis, “The Legacy of Margaret Cavendish” (2002); and James, “The Philosophical Innovations of Margaret Cavendish” (1999).

³⁷³ The only manuscript copy of *Physiologia* that I have discovered is in Bod., MS Rawl D 257, ff. 1-129. But the title page says it was “compiled” in 1660, meaning that it was a later transcription from an already published book.

until late 1652.³⁷⁴ For her own part, Cavendish returned to England in November 1651 and supposedly produced *Poems, and Fancies* during her first “nine Months in” England, meaning that it was probably in manuscript by mid-1652, or right around the time that Charleton would have commenced his composition of *Physiologia*.³⁷⁵

Rather than reading Charleton, we saw in 1.2 that atomism was a principal point of deliberation in the Cavendishes’ salon, and it was in this milieu that Margaret became fascinated by the topic. If anything, there is more evidence to indicate that Cavendish stimulated Charleton’s engagement with Gassendi’s atomism upon her return to England.³⁷⁶ A letter from 1655 that Charleton despatched to Cavendish—thanking her for a gift copy of *The World’s Olio*—suggests that Charleton not only conversed with Cavendish but that he was also another reader of her early publications. He asserts that her “*Philosophical Phancies* have furnished me with variety of such Novel Conceits, concerning sundry the most difficult Problems in Nature” and describes the “Fayeries in the Brain” that Cavendish discusses in *Poems, and Fancies*.³⁷⁷ Cavendish’s rejection of the atomic hypothesis seems to have grown out of her belief that it inadequately accounted for the intricacies of animal life.³⁷⁸ But Charleton’s decision to translate and expand upon Gassendi’s commentaries—making it widely available to an English audience—may have been another incentive for Cavendish to distance herself from the atomic hypothesis and to discover a new philosophical niche.

³⁷⁴ *Darknes of Atheism*, C3r.

³⁷⁵ *Poems, and Fancies*, A7r.

³⁷⁶ See Kargon, *Atomism in England*, 84.

³⁷⁷ *Letters and Poems*, 142-3. See Fleitmann, *Walter Charleton (1620-1707), “Virtuoso”: Leben und Werk* (1986), 70-2.

³⁷⁸ For an example of early critical engagement with *Physiologia*, see the copy annotated by William Brouncker, the first president of the Royal Society, in Cambridge University Library, Adv.a.27.7.

While we will see that Cavendish deviated from van Helmont in many ways, there is a sense in which she exchanged substance theories with Charleton. Instead of discussing atoms, Charleton's early translations dwell on the nature and functions of spirits. Arguably equipping his spirits with even more power than Cavendish's, Charleton wrote in his *Ternary of Paradoxes*, for instance, that the "*Vitall Spirit* in the throne of *flesh and blood*, that is the outward man, sits Viceroy to the *Soule*, and acts by her commission: and is the same *plastick spirit*, which in the seed comprehends, contrives, and models the whole figure of man", affirming that the spirit "understands the praedestinate ends of all its designes and undertakings".³⁷⁹ Because such views are a far cry from Gassendi's atomic size, shape, and weight, they proved a source of embarrassment for Charleton. In a rather mercurial manner, he derided the whimsies of "Hair-brain'd and Contentious Helmont" in *Physiologia*, only four years after translating his works.³⁸⁰ Charleton's exclusion of *A Ternary of Paradoxes* and *Deliramenta Catarrhi* from the post-script to his 1683 *Three Anatomic Lectures* that lists his previous publications indicates the extent of his spurn these erstwhile Helmontian works.³⁸¹ Seemingly desiring to forget that he undertook these translations at all, Charleton's manuscript catalogue of his publications jumps directly from his *Spiritus Gorgonicus* of 1650 to his *Darknes of Atheism* of 1652, despite including numerous other translations and anonymously published volumes.³⁸²

In part because he was keen to distance himself from his earlier Helmontian discourse, Charleton habitually misconstrued and expressed a calculated reticence

³⁷⁹ Charleton, *A Ternary of Paradoxes* (London, 1650), 58.

³⁸⁰ Charleton, *Physiologia Epicuro-Gassendo-Charltoniana* (London, 1654), 58.

³⁸¹ See *Three Anatomic Lectures*, P3r-4v.

³⁸² See MS Smith 13, ff. 146v-7r.

towards Cavendish's ideas. This is perhaps most apparent in a manuscript draft of a letter to Cavendish in which he wrote that "For Your Natural Philosophy; I ask leave likewise to confess, Madam, I have not yet bin so happy, as therein to discover much, wherein I think myself obliged to acquiesce".³⁸³ Softening the sentiment, Charleton notes in the epistle that he actually sent that her natural philosophy is still "ingenious and free, and may be, for ought I know, Excellent".³⁸⁴ In tension with the account presented here, which usually amounts to the recognition that chymical ideas occasionally coloured his atomism.³⁸⁵ It is true that Charleton appeals to spirits at intervals in *Physiologia* such as when he rhetorically asks what the faculties of animals are if not "*Identical* with the *Spirits* of it, i.e. the most subtile, most free, and most moveable or active part of its materials?".³⁸⁶ Yet we saw in the last chapter that such eclecticism was commonplace during the seventeenth century and is just as prominent in Gassendi's original commentaries. Further, Charleton's natural philosophy was far more sympathetic with Descartes' brand of mechanical philosophy than was Gassendi's before him.

How Cavendish and Charleton departed can be plainly seen by looking at their approaches to the circulation of the blood. Charleton was inducted into Harvey's theory early on, but he increasingly deviated from the insights of his physiological mentor. In his 1657 discussion of the blood's circulation, Charleton makes it clear that he sought to reduce the maxims of the circulation of the blood "from obscure and conjectural, to evident and demonstrative" through the "principles of Mechanicks".³⁸⁷ In his slightly

³⁸³ MS Smith 13, ff. 47.

³⁸⁴ *Letters and Poems*, 111.

³⁸⁵ See Booth, '*A Subtle and Mysterious Machine*': *The Medical World of Walter Charleton* (2005); Lewis, "Walter Charleton and Early Modern Eclecticism" (2001); and Fleitmann, *Walter Charleton*, 109-19.

³⁸⁶ *Physiologia*, 272.

³⁸⁷ *The Immortality of the Human Soul*, 36.

earlier *Physiologia*, Charleton extolled Descartes as the force driving this endeavour:

“Gratitude it self doth oblige us to account the Heroical *Tycho Brahe*, the subtle *Kepler*, the most acute *Galilaeus*, the profound *Scheinerus*, the miraculous because universally learned *Kircherus*, the most perspicacious *Harvey*, and the Epitome of all, *Des Cartes*”.³⁸⁸ It may be noted that Charleton mentions both Harvey and Descartes here.

Indeed, Descartes himself claims to affirm “the opinion of *Harvy*, concerning the circulation of the blood” in the *Passions*, shaping his as a fellow innovator. But such passages must not be taken at face value.³⁸⁹ Especially for those who were disciples of Harvey, Descartes was his physiological adversary. Probably the most famous early proponent of Harvey’s works, Francis Glisson, even gave a lecture titled “Sententia Cartesij de motu cordi non est veritati consentanea” [“Descartes’ idea regarding the motion of the heart is not consonant with the truth”].³⁹⁰ This is because Descartes emphasised how the natural heat implanted in the heart by God caused it to function as a pump that pushed blood through the veins. Despite arguing that blood moved through the body due to a single system of arteries and veins, Harvey had a far less centralised notion of its circulation.³⁹¹ Identifying the blood’s heat with vital spirits from his 1628 *De motu cordis* onwards, Harvey plainly stated in his *De circulatione sanguinis* of 1649 that the circulation of the blood is not primarily caused by the contraction of “the *heart*, but by the meer impulsion of the blood”, which is “the first efficient cause of the pulse, as likewise to be the common instrument of all operations” in the body.³⁹² By inscribing the

³⁸⁸ *Physiologia*, 3.

³⁸⁹ *The Passions of the Soule*, 6.

³⁹⁰ BL, Sloane MS 3309, 141r-5v.

³⁹¹ See Fuchs, *The Mechanization of the Heart: Harvey and Descartes*, trans. by Grene (2001) and French, *William Harvey’s Natural Philosophy*, 179-226.

³⁹² Harvey, *Two Anatomical Exercitations Concerning the Circulation of the Blood* (London, 1653), 75 and 88.

heat and vitality of Galenic spirits into the blood—which he saw as the primary cause of its circulation—Harvey mitigated the unorthodox implications of his hypothesis.³⁹³

It has previously been argued that Cavendish drew chiefly upon Descartes' discourse on the blood's circulation in developing her own ideas.³⁹⁴ Cavendish would have undoubtedly been conversant with Descartes' discussion of the circulation, since Charles took an intense interest in Descartes' medical ideas, and even noted in his manuscript that there are “Veines in the liver, large enough, by which the chylus may pass from the gate veyne into the hollowe weyne & from thence to the hearte”, citing his source as a “Mons^r des Cartes [^ page] 138 of the Passions”.³⁹⁵ Yet, in *The World's Olio*, Margaret invokes Harvey rather than Descartes, writing that the

most Renowned and most Learned Physician, Doctor *Harvey*, hath found out the Circulation of the Blood, by his industrious study, so methinks it should be very beneficial towards the health of Man, to find out the Motion of the Blood, as it runs, whether it hath one intermixing Motion as it runs; or whether the Blood doth not do as the Water seems to do, which going in a swift source, where the following Drops are as great Strangers to the leading Drops, as the situation of either Pole.³⁹⁶

It is possible that Cavendish simply associated the circulation of the blood with Harvey's name. But her emphasis on the blood's activity—instead of the mechanical role of the heart—suggests a more profound engagement with his works. At one point, she even mentions that if the blood of an ill individual is not let, then “Corrupted Blood may infect the Vital Parts, as it runs along”.³⁹⁷ At the time that Cavendish wrote *The World's Olio*,

³⁹³ For Galen's ideas on blood flow, see Siegel, *Galen's System of Physiology and Medicine: An Analysis of his Doctrines and Observations of Bloodflow, Respiration, Tumors and Internal Diseases* (1968), especially 30-65. On Harvey's manipulation of these ideas, see White, “Harvey and the Primacy of the Blood” (1986).

³⁹⁴ Semler, “Early Engagement”, 336-7.

³⁹⁵ See Harley MS 6083, ff. 106r.

³⁹⁶ *The World's Olio*, 180.

³⁹⁷ *The World's Olio*, 180.

there was minimal public awareness of Harvey's ideas.³⁹⁸ But his notion of circulation gradually captured the popular imagination, and he was increasingly valorised as a revolutionary who overturned Galenic medicine. This culminated in Harvey's hypostasis into a symbol of modernity in the debate over the ancients and moderns between Joseph Glanvill and Henry Stubbe. Cavendish notably lauds Harvey's "*industrious study*", however, rather than his experimental capabilities or physiological innovations. It is well known that Harvey was profoundly indebted to Galen and especially Aristotle, and we will see more fully in the next chapter that the English translations of Harvey's publications acted as an indispensable source of Aristotelian ideas for Cavendish.³⁹⁹

Versifying her thoughts on the inherent power of the blood in *Philosophicall Fancies*, Cavendish writes that "Like Marrow in the Bones, or Bloud in Veins. / Or thinner Matter which the Bloud containes. / Like Heat in Fire, the effect is strait to burne, / So *Matter thin* makes *solid Matter* run".⁴⁰⁰ In keeping with Harvey, Cavendish held that blood contained thin and vital matter—which are certainly the spirits that she considered to be so plentiful in the blood—and this is what causes its propulsion through the veins.⁴⁰¹ Developing the substance theory of *Philosophicall Fancies*, she abstracts from the vitality of Harvey's blood and spirits to account for the additional functions of animals and the natural world. With this wider application, Cavendish drew on chymical

³⁹⁸ On Harvey's popular reception, see Frank, "The Image of Harvey in Commonwealth and Restoration England" (1979) and Boyle, "William Harvey's Anatomy Book and Literary Culture" (2008).

³⁹⁹ The classic work on Harvey's Aristotelian-Galenic medicine is Pagel, *William Harvey's Biological Ideas: Selected Aspects and Historical Background* (1967). Also see Cunningham, "William Harvey: The Discovery of the Circulation of the Blood" (1987) and French, *William Harvey's Natural Philosophy*, especially 71-92.

⁴⁰⁰ *Philosophicall Fancies*, 9.

⁴⁰¹ On the connection between blood, heat, and spirits in Harvey's work, see Frank, *Harvey and the Oxford Physiologists*, 12-6 and 38-42.

discourses and especially the ideas of van Helmont, both as they were evident in the Cavendishes' medical book and as they were translated and developed by Charleton.

There are three significant chymical substances that she introduces in this discussion: *vitriol*, *aqua fortis*, and *aqua vitae*. Cavendish relates Harvey's notion of circulation to the latter in *The World's Olio* when she writes that "From Wine is distilled *Aqua vitae*, or the like, which are Spirits by the means of Fire; and Wine in a Barrel, if it be much frozen, will cause all the Spirits in the Barrel to gather together in the midst, and no Spirits are left in that which is frozen; as likewise in extreme Fear, all Spirits will be drawn to the Heart, as the Center".⁴⁰² Indicating the centrality of vital heat in the process of circulation, she proceeds to announce that "as Cold draws all Spirits inward, so Heat thrusts all Spirits outwards". One of Harvey's innovations was of course the recognition that the heart's active motion was a forceful systole (or contraction) rather than diastole (or dilation) as physicians had previously held. Cavendish thus analogically associates the *aqua vitae* that amasses in the centre of a barrel due to its heat before being dispersed through chymical extraction with the blood that collects in the heart prior to being thrust outward; she pairs the latter with the Galenic notion that the passions are localised in the heart. *Aqua vitae*, or "water of life", initially signified an aqueous solution of ethanol, but the term gradually came to denote the general procedure for distilling liquors, as hinted at here. Over the course of the seventeenth century, "*aqua vitae*" was slowly translated into English as "the spirit of wine". Charleton accordingly writes that "the spirit of Wine, by a natural tendency, flies from cold, as from his proper enemy; and gently withdraws itself, from its former mansion, into the Centre of the

⁴⁰² *The World's Olio*, 183.

Wine”.⁴⁰³ With Harvey’s discourse acting as an intermediary, the close linguistic tie between *aqua vitae* and the language of spirits supplied Cavendish with a model for how an English discourse could consolidate chymical substances with Galenic medicine.

In *Philosophicall Fancies*, Cavendish explicitly deploys these chymical terms to develop her spirits. She writes that sensitive spirits “are of an acute quality, being the *Vitrioll*, as it were, of Nature”.⁴⁰⁴ Proceeding, she asserts that as “the *Sensitive Spirits* are a weak *knowledge*, so this [rational spirits] is a stronger *Knowledge*. as to similize them, I may say, there is as much difference betwixt them, as *Aqua Fortis*, to ordinary *Vitrioll*”.⁴⁰⁵ In seventeenth-century chymical discourse, *vitriol* was a sympathetic powder with the power to cure diseases at a distance, and *aqua fortis*, which is Latin for “strong water”, referred to nitric acid. *Aqua fortis* was usually prepared by mixing *vitriol* with saltpetre before being distilling by fire. Since *vitriol* is required in the production of *aqua fortis*, Cavendish uses this analogy to distinguish between sensitive and rational spirits, while representing them as mutually constitutive innated matter. *Aqua fortis* is also more potent and agile than regular *vitriol*, capturing the notion that the rational spirits are subtler than the sensitive. What is more, it has been noted that *vitriol* was thought to be a sympathetic powder with the power to remedy diseases at a distance, and Cavendish held that spirits interact through sympathetic relations.

In the Cavendishes’ medical book, there is a recipe describing how “to make the Powder of Simpathy” using “Romane vitrioll”. Whether directly or circuitously, this recipe was probably derived from Digby, who was famous for concocting this powder. While Digby initially restricted the circulation of the recipe to a small circle, chiefly

⁴⁰³ *Ternary of Paradoxes*, 112.

⁴⁰⁴ *Philosophicall Fancies*, 18.

⁴⁰⁵ *Philosophicall Fancies*, 30.

through discussion, it became so popular that he published *A Late Discourse* [...] touching the cure of wounds by the powder of sympathy in 1658, which went on to be reprinted forty times by the early eighteenth century.⁴⁰⁶ Part of the reason why Digby was driven to publish his recipe was because Charleton's prolegomena to *Ternary of Paradoxes* had granted his powder of sympathy with intellectual currency. Here Charleton retells a story that he had heard from "Sir K. Digby (a noble Person, who hath built up his Reason to so transcendent a height of Knowledge, as may seem not much beneath the state of man in innocence) immediately before his late exile".⁴⁰⁷ In stark contrast to his later Gassendian antagonism towards occult qualities in *Physiologia*, Charleton used his story from Digby to argue that the powder of sympathy proved the existence of a puissant energy between vitriol and wounds. As Charleton's appeal to Digby's spoken authority suggests, chymical ideas were based on discussions as much as sustained reading, highlighting the difficulty of strictly differentiating between what Cavendish learnt on the continent and in England. It was her piecemeal early readings and conversations that conditioned her critique of Descartes' absolutism on chymical lines. In this respect, Mayerne's fear that Margaret would follow his advice "by peace-meales according to her Custome" in a letter to William Cavendish is significant, showing that her physiological approach seeped into her medical habits.⁴⁰⁸ Yet the medical book also implies that her failure to stringently follow any particular medical authority resulted from her attempt to incorporate advice from too many physicians.

⁴⁰⁶ See MS Pw V 90 ff. 70r. On the circulation of Digby's recipe for the powder of sympathy in Henrietta Maria's court, see BL, Sloane MS 3297. On Digby and the powder of sympathy more generally, see Lobis, *The Virtue of Sympathy*, 36-68 and especially Hedrick, "Romancing the Salve: Sir Kenelm Digby and the Powder of Sympathy" (2008).

⁴⁰⁷ *A Ternary of Paradoxes*, D2r.

⁴⁰⁸ MS Pw V 90, ff. 28r.

It may seem strange that Cavendish chiefly imported Latin terms at moments when she engaged with the chymical discourse instead of Galenic medicine. But she did so because she endorsed the continued implementation of technical Latin terminology as chymical texts were translated into English over the course of the 1640s and 1650s. By contrast, medical humanists translated Galen during the first half of the sixteenth century from Greek to Latin—rather than into English—which meant that his language had already been subsumed into a popular English discourse by the time that Cavendish started publishing.⁴⁰⁹ While she appreciated the medical application of Latin, Cavendish believed that “English is a compounded Language, as mithredated of many ingredients, or it is like a Cordiall water, whose spirits are extracted from many severall simples”.⁴¹⁰ In this sense, English was an apposite language for medical discourse and for her own ideas in particular. In a prefatory poem to Charleton’s *Darknes of Atheism*, it is also written that “*Th’ English is Latin*. Know, that th’ English Tongue / Hath from each Language Consummation”, suggesting that this was a more widespread sentiment.⁴¹¹ In her own reflections on the subject, Cavendish’s usage of the term “mithredated” underscores how this process of compounding occurred. Mithradates VI of Pontus famously attempted to immunise himself against poison by taking a daily dose of his own venomous compound. From Mithradates’ Greek name (Μιθριδάτης) emerged the Latin *mitridatum* and eventually the French *methridat*, both of which signify a universal antidote or a panacea.⁴¹² The Latin and French significations meshed to form the English

⁴⁰⁹ See Webster, *The Great Instauration*, 256-64. On editions and translations of Galen, see Durling, “A Chronological Census of Renaissance Editions and Translations of Galen” (1961) and Fortuna, “The Latin Editions of Galen’s *Opera omnia* (1490-1625) and Their Prefaces” (2012).

⁴¹⁰ *Natures Pictures*, C5r.

⁴¹¹ *Darknes of Atheism*, C4r.

⁴¹² See *OED*, “Mithridate”, n., 1a.

“mithridate”, which Cavendish then turned into the English adjective “mithredated”, in an attempt to endow such medical language with broader philosophical import.

Cavendish in fact coined new words or endowed old terms with a new sense for the first time in no less than eighty-five instances, according to the *Oxford English Dictionary*.⁴¹³ These new words almost all arose from either compounding or her simple addition of a prefix or suffix. Another case in point is when Cavendish affixes the suffix “-ness” to the adjective “agile” to make the abstract noun “agileness”. Coined to suit her philosophical needs in *Philosophicall Fancies*, this term denotes the degrees of agility that distinguish sensitive and rational spirits. Her creation of such terms is an attempt to render the Latin secondary feminine suffixes that were deployed to describe the qualities of microparticles into English, in the process of establishing English as a language that could adequately grapple with ancient philosophical material.

The degree to which Cavendish required direct knowledge of Latin to enact such translations is difficult to judge, but she was probably more capable of reading Latin than she sometimes lets on, with Latin being at least partly understood, if not fluently written and spoken, by most thinkers in the 1650s.⁴¹⁴ That Cavendish had some Latin is implied in letters such as the one that Barlow wrote to her in 1655 upon receiving copies of *Philosophical and Physical Opinions*. In the books that he distributed to some of the colleges—such as Magdalen College—Barlow recounts how he inscribed “Liber Collegii Divae Magdalenae, ex Dono Illustrissimae Heroinae *Margaretæ Novo-Castrensis* Marchionissae, Authoris” [“The book of the college of the blessed Magdalene, a gift from the author, the most distinguished heroine Margaret, Marchioness of Newcastle”].

⁴¹³ See *OED*, “Duchess of Newcastle”, “First Quotation in Entry or Sense”.

⁴¹⁴ Grafton, *New Worlds, Ancient Texts: The Power of Tradition and the Shock of Discovery* (1992), 75.

Immediately following this Latin part of the letter, Barlow states: “What this signifies your Honour may easily know”, perhaps with her scattered use of Latin in mind.⁴¹⁵ We will look more at Cavendish’s desire to have her works translated into Latin in 4.3, but for now it is worth noting Mayne’s suggestion that Cavendish was engaging in a process of translation. Having asked a “young Scholar” to translate *Poems, and Fancies* from English to Latin, Mayne was told that “hardest part of his Task will be how to find out current *Roman* Words to match” Cavendish’s philosophical terminology. In response, Mayne advised the young scholar to “read *Lucretius* before he proceed farther; who having softned the most stubborn parts of Natural Philosophy, by making them run smoothly in his tunable Verses, by an easy Imitation will teach him to do the like.”⁴¹⁶ The translator accordingly needed to return to the Latin poet-philosophers from which Cavendish’s philosophical language was originally (if indirectly) derived in the process of reverse translation.

In any case, while the tradition of learned medicine remained grounded in the Latin language during the mid-seventeenth century, Cavendish saw her compounding of English words as commensurate with the Galenic tradition. Learned physicians held that compounding herbs—commonly with mineral and occasionally animal substances—created more efficacious remedies. Medics were supposed to apply their skill, learning, and experience to select the best ideas from the storehouse of past knowledge to create these compounds.⁴¹⁷ Galen thought that compounding produced qualitative changes (such as decreasing a remedies heat), and that these represented real transformations in the efficacy of a medicine. In reaction to Galen, van Helmont argued that the historical

⁴¹⁵ *Letters and Poems*, 66.

⁴¹⁶ *Collection of Poems*, 96-7.

⁴¹⁷ See Wear, *Knowledge and Practice in English Medicine*, 92-103.

layering of ideas that eventually led to confidence in particular compounded recipes was one of the chief sources of error in the medical tradition. Believing that compounds and “correctives” simply weaken the power of a remedy’s constituent parts, van Helmont conceived of only simples (or single remedies made from one ingredient) as truly effective. Rather than emphasising the history of medicine or philosophy, he alleged that only the intuitions of individual adepts could reach the knowledge of simples. They were gifts from God that the divine medic could restore to prelapsarian perfection.

Since he maintained that his medical ideas constituted a fundamental break with the pagan history of Galenic medicine, van Helmont believed that they required a corresponding set of new linguistic tools. The term “gas” is a Helmontian coinage that is still in use today, and he makes it known throughout his oeuvre that “Gas and Blas are indeed new names brought in by me, because the knowledge of them hath been unknown to the Antients”.⁴¹⁸ Bemoaning such coinages, Cavendish writes in *Philosophical Letters* that van Helmont’s medicine is “built upon so strange grounds and principles as *Ideas, Archeus, Gas, Blas, Ferment*, and the like, the names of which sound so harsh and terrifying, as they might put any body easily into a fright, like so many Hobgoblins or Immaterial spirits”.⁴¹⁹ At the most rudimentary level, Cavendish did not consider these terms to signify anything concrete, only making sense to those who have bought into his peculiar visions. Against van Helmont’s belief that a new understanding of animal life and the natural world relied on the visionary’s reveries, Cavendish agreed with Galen that qualitatively “new” insights arose from the selection and assimilation of past ideas. In

⁴¹⁸ van Helmont, *Van Helmont's works containing his most excellent philosophy, physick, chirurgery, anatomy* (London, 1664), 70. See Pagel, *Joan Baptista van Helmont: Reformer of Science and Medicine* (1982), 60-70.

⁴¹⁹ *Philosophical Letters*, 239.

this, Cavendish was already moving away from the eclecticism that she embraced in *Poems, and Fancies*, as we saw in the last chapter. In contrast to Gassendi's notion that an array of atomic shapes join in the creation of bodies or compounds but retain their shape as individual atoms, Galen held that the very process of compounding changes the lineaments of the component parts. Since the creation of compounds was reliant on past medical knowledge, this view was allied with the idea that the manipulation of previous philosophical precepts enables the creation of new principles. We saw at the beginning of this section that there were social and institutional reasons for Cavendish to defend the College of Physicians and the universities, but this suggests that her commitment to Galenic medicine had a deeper intellectual resonance. The fullness of Cavendish's philosophical and physiological discourse comes through sensitivity to conceptual correspondences, observing ways in which the ideas of different thinkers sympathise. While we have seen that her spirits are extracts of dull matter, she deemed the subsequent intermingling of diverse spirits to engender more complex forms of life such as plants and animals.⁴²⁰

Despite her hostility towards his enthusiasm for coinages, Cavendish appropriated some of the ideas that van Helmont formulated using his strange, new terms. A more theoretical chymical notion that is absent from the Cavendishes' medical book—but proved an important concept for Cavendish in the development of her vital spirits—is van Helmont's "*archeus*". In his *Ternary of Paradoxes*, Charleton relays how van Helmont arrived at the idea of *archeus* by reasoning that there must exist

some precedent or elder principle, which must be wholly and purely immaterial, yet real, and operative, to which may be justly attributed the power of figuration or delineation, by a sigillary impression upon the *Archeus*, or Regent Spirit of

⁴²⁰ *Philosophicall Fancies*, 19.

the *Seed*. The Soul of the *Genitor*, therefore, when it descends to visit and relieve the inferior faculties, and makes a progress to survey the Seed, in a paroxysm of carnality, doth upon the mass of seed, engrave and adumbrate the impress and *figure of it self*.⁴²¹

Here Charleton highlights that van Helmont's divine *archeus*—or the vital power suffused throughout matter—is the most condensed in the “seed”. This notion of the seed implies wisdom and purpose in nature: it is the spiritual essence that carries the life-plan of each being or object.⁴²² In the last chapter, we saw that Gassendi shifted the Lucretian concept of “*semina*” to “atoms” in order to challenge Aristotle. Moving in the opposite direction, Cavendish explicitly discusses her subtle matter as “the *Spirits* that are in the *Seed*” in *Philosophicall Fancies*. She writes that when seeds “have undone the *figure* they are in, by a general expulsion, which we call *corruption*, they begin to create againe another *figure* of the same kinde, if no greater power hinder it”.⁴²³ These seeds are chiefly generative forces, yet we know that Cavendish considered animals to be dynamic creatures rather than stable productions. She believed that spirits actively gather and flee as animals grow and deteriorate, since even “*Death*, or *corruption*, is not an absence of life, but an *expulsive motion* which doth *annihilate* those *figures*, that erecting *motion* hath made. So *death* is an *annihilation* of the *Print*, not of the *Mould* of *figures*; for the *Moulds* of those *figures* of Mankind, Beast, or Plant, of all kinds whatsoever, shall never be *annihilated* so long as *motion* and *matter* last”.⁴²⁴ In other words, Cavendish's seeds are moulds that guarantee the continued existence of natural kinds: *semina* is closely related to semen.

⁴²¹ *A Ternary of Paradoxes*, 129.

⁴²² See Pagel, *Joan Baptista van Helmont*, 96-101.

⁴²³ *Philosophicall Fancies*, 22. See Hirai, *Le concept de semence*, especially 439-62.

⁴²⁴ *Philosophicall Fancies*, 20.

The next chapter looks more closely at Harvey's *De generatione*, but we can note here that Cavendish strayed from Galen and the seventeenth-century medical orthodoxy of preformation by rehabilitating a version of Aristotelian epigenetics, according to which seeds slowly become animals.⁴²⁵ Perhaps most importantly, Cavendish's discussion of seeds allowed her to distinguish between natural kinds and man-made machines. Despite both being composed of active spirits, natural kinds possess generative seeds, whereas man-made machines function "as a *Hand* that is guided by another, and not of its own strength: that is the reason, Arts have not so much perfection as Nature".⁴²⁶ This, for Cavendish, is where Descartes' mechanical analogy breaks down. Man-made machines and animals are composed of the same matter, but the substance that composes natural kinds is innate in the spirit of the seed, while knowledge is conferred from the outside in the production of machines. Developing these ideas, Cavendish may very well have drawn on van Helmont's concept of *semina*, yet there is a sense in which he also considered knowledge to stand outside matter. Not unlike Descartes, van Helmont's matter is inert, and all activity and life enter from the outside through the divine *archeus*.⁴²⁷ Instead of infusing matter with an immaterial, vital principle, Cavendish held that matter itself contains the vital power of the seed.

As her manipulation of the *archeus* suggests, Cavendish did not deem van Helmont's chymistry to signal a break with history, but rather believed that it presented an additional set of ideas that could be distilled and compounded with other medical discourses. Taking the absorption of Harvey's theory of circulation into the medical

⁴²⁵ See Aristotle, *On the Generation of Animals*, trans. by Peck (1979), 33b20 and "Introduction", x-xii. Also see Pagel, "The Reaction to Aristotle in Seventeenth-Century Biological Thought: Campanella, Van Helmont, Glanvill, Charleton, Harvey, Glisson, Descartes" (1953).

⁴²⁶ *Philosophicall Fancies*, 19-20.

⁴²⁷ Giglioni, *Immaginazione e Malattia: Saggio su Jean Baptiste van Helmont* (2000).

curriculum as a model, Cavendish contended that the inclusion of some chymical concepts into the accepted framework of Galenic medicine would ameliorate the art of physick instead of creating destructive factions. But it was a more arduous endeavour to subsume van Helmont into the medical establishment for two interwoven reasons. First, van Helmont's ideas did not merely challenge some physiological themes, but provided a whole new set of medical approaches to extirpate Galenic medicine in a manner similar to Gassendi's attempt to supplant Aristotle with Epicurus. Second, whereas Harvey revered ancient learning and situated his own publications within a historical tradition, van Helmont expressed a vitriolic enmity towards ancient ideas and methods.

When Cavendish came to critique van Helmont in *Philosophical Letters*, she was most exasperated by his arrogant dismissal of Aristotle and Galen. In response to van Helmont's disdain for "the schooles of the humourists", she thought that it was too great a presumption for any man to pretend that "he alone hath the true knowledg of all things as infallible and undeniable, and that so many Learned, Wise and Ingenious Men in so many ages have been blinded with errors".⁴²⁸ She went on to state that

without making now any difference betwixt the *Galenists* and *Paracelsians*, and examining which are the best, (for I think them both excellent in their kinds, especially when joyned together) I will onely say this in general; that the Art of Physick has never flourish'd better then now, neither has any age had more skilful, learned, and experienced Physicians, then this present; because they have not onely the knowledg and practise of those in ages Past, but also their own experience joyned with it, which cannot but add perfection to their Art.⁴²⁹

While Cavendish abstains from naming van Helmont in this passage, she considered him to be a "Paracelsian", or a follower of Paracelsus, who was widely regarded as the

⁴²⁸ *Philosophical Letters*, 246. See Browne, "J.B. van Helmont's Attack on Aristotle" (1979). But also see Newman's work on Aristotelian chymistry: *Gehennical Fire: The Lives of George Starkey, an American Alchemist in the Scientific Revolution* (1994), especially 32-9 and 151-58 and "Experimental Corpuscular Theory in Aristotelian Alchemy: From Geber to Sennert" (2001).

⁴²⁹ *Philosophical Letters*, 352.

founder of modern chymistry.⁴³⁰ Taking van Helmont at his word, it has frequently been argued that Galenic and chymical approaches to medicine—particularly in the period prior to the Restoration—were in fundamental tension, usually with an emphasis on party politics.⁴³¹ Although some medical reformers may have followed van Helmont in insisting upon the incompatibility of these medical orientations, Cavendish had reason to believe that a balance could be struck between Galenic and Paracelsian orientations. It has already been suggested that Mayerne attempted to unite learned and chymical medicine, and, as early as 1603, he published an *Apologia* for chymical remedies, claiming that they did not violate the laws and methods of Galen.⁴³² Following the likes of Mayerne, Digby wrote to William Cavendish that the composition of his powder of vipers “is just y^e same as Gallen Proscribed w^{ch} they w^{ch} observe Religiously & are accurate in y^e Choyce of their Ingredients doe make perfect Compositions I may say Miraculus ones”.⁴³³ Despite deviating notably from the diagnosis and prescription of traditional medicine, then, Digby asserted that the process of compounding his recipe fully accords with Galenic principles. The same can be said of Charleton, who of course had personal reasons for preserving medical authority, and who seems to have been quite conservative in his prescriptions even as he translated and promoted works of Helmontian

⁴³⁰ The classic study of Paracelsus is Pagel, *Paracelsus: An Introduction to Philosophical Medicine in the Era of the Renaissance* (1958). Also see Grell, *Paracelsus: The Man and his Reputation, his Ideas and their Transformation* (1998).

⁴³¹ See Rattansi, “The Helmontian-Galenist Controversy in Restoration England” (1964) and “Paracelsus and the Puritan Revolution” (1963). Also see Webster, “English Medical Reformers of the Puritan Revolution: A Background to the ‘Society of Chymical Physitians’” (1967) and Hill, *The World Turned Upside Down: Radical Ideas during the English Revolution* (1972), 231-46. Valuable revisionist accounts are Cook, “The Society of Chemical Physicians, the New Philosophy, and the Restoration Court” (1987) and Levitin, “‘Made up from many experimentall notions’: The Society of Apothecaries, Medical Humanism, and the Rhetoric of Experience in 1630s London” (2014).

⁴³² See Trevor-Roper, *Europe’s Physician*, 60-83.

⁴³³ See MS Pw V 90, ff. 51r-2v.

medicine.⁴³⁴ Taking her lead from these thinkers, Cavendish highlights the overlap between the ideas of chymical reformers and institutional physicians from *Philosophicall Fancies* onwards. Contrary to what Lisa Walters has recently argued, Cavendish's engagement with chymical ideas was not uncommon among Royalist physicians, and certainly does not make her a "radical" thinker.⁴³⁵

It is true that Cavendish's substance theory moved her towards the periphery of seventeenth-century thought. Nonetheless, in this marginal place, she ironically met Francis Glisson, one of the most institutionally prominent physicians of her day. Glisson was Regius Professor of Physic at Cambridge from 1636-1677, a distinguished fellow of the Royal College of Physicians (of which he was the president three times), and a founding member of the Royal Society. Before teaching medicine, Glisson lectured on Greek language, literature, and philosophy. Continuing this concern, a profound debt to the ancients—especially Aristotle and Galen—is palpable throughout his publications. Part of the early Harveian circle, he was also instrumental in introducing the theory of circulation to the English universities.⁴³⁶ With the assistance of many of the same colleagues that spread Harvey's ideas, Glisson published his first treatise in 1650, *De rachitide sive morbo puerile*, and a translation by Philip Armin followed shortly thereafter. This treatise explored cures for "rickets", which was considered to be a "new disease". Because of its novelty, Galen could not have explained rickets, meaning that an

⁴³⁴ Booth, 'A Subtle and Mysterious Machine', 14.

⁴³⁵ See Walters, *Margaret Cavendish: Gender, Science and Politics*, 160-72.

⁴³⁶ On Glisson as an early proponent of Harvey's ideas in Cambridge, see French, *William Harvey's Natural Philosophy*, 286-309.

innovative cure could be produced for it without overtly challenging the medical establishment.⁴³⁷

While Glisson's substance theory was not fully developed in his *Treatise on Rickets*, he still divulges his long-held belief that "Life cannot consist without a Vital Spirit".⁴³⁸ Even as Charleton moves towards a mechanical physiology, it remains the case that, like other English physiologists such as Thomas Willis and Henry Power, his views on spirits were deeply indebted to Glisson's teachings.⁴³⁹ Glisson also gifted his later *De natura substantiae energetica* to Charleton. This book presents Glisson's mature matter theory, and Charleton was evidently looking out for how his substance theory had evolved, since the only marginal note in his copy is the scribble: "Summarium Hypothesis de perception naturali cuique substantiae inhaerenti" ["A summary of the hypothesis of the inherent natural perception of matter"].⁴⁴⁰ It is certainly conceivable that Cavendish heard about or even read Glisson's work at some point. But the overlap between Cavendish's and Glisson's positions most probably emerged through her engagement with the traditions that he drew upon—especially the ideas of Harvey and van Helmont—rather than through the direct influence of Glisson.

Like Cavendish, Glisson struck a balance between van Helmont's concept of an immaterial *archeus* that is superadded to matter and Harvey's belief in the vitality of blood itself by inscribing the sensitivity and rationality that cause natural bodies to function into Galenic spirits.⁴⁴¹ In accordance with Cavendish's notion that vital spirits

⁴³⁷ See Stevenson, "'New Diseases' in the Seventeenth Century" (1965) and Clarke, "Whistler and Glisson on Rickets" (1962).

⁴³⁸ Glisson, Bate, and Regemorter, *A Treatise of the Rickets being a disease common to children*, trans. by Armin (London, 1651), 100.

⁴³⁹ Clericuzio, *Elements, Principles and Corpuscles*, 97.

⁴⁴⁰ BL, *Tractus de natura substantiae energetica*, 535.d.17, 217.

⁴⁴¹ See French, *William Harvey's Natural Philosophy*, 304-8.

are extracted from inert matter, Glisson argued that “being is perceptive in itself and there is a sort of development from the primordial vegetative root of nature up to the sensitive and intellective degrees of perception via progressively more complex units”.⁴⁴² For this reason, all matter is imbued with life, with the difference between “living” and “non-living” simply being a matter of organisational complexity. Neither Glisson nor Cavendish had fully thought through their ideas on perception by the early 1650s; however, as we will see more fully in the next chapter, they both came to believe that natural perception endows even the least organised matter with a form of life.⁴⁴³ In this sense, they forwarded substance theories that strongly resemble what Ralph Cudworth termed “hylozoism” in his *The True Intellectual System of the Universe* of 1678. In his critique of this supposedly atheistic substance theory, Cudworth writes that some thinkers “have talk’d sometimes of *Sensitive* and *Rational Matter*, as having a mind to suppose, *Three* several sorts of *Matter* in the Universe, Specifically different from one another, that were Originally such, and Self-existent from Eternity; namely *Sensless*, *Sensitive* and *Rational*”.⁴⁴⁴ The institutional proximity of Cudworth and Glisson at Cambridge during the 1670s means that Cudworth’s chief target was almost certainly Glisson’s 1672 *De natura substantiae energetica*. That said, because Cavendish’s evolving substance theory closely resembled Glisson’s, Cudworth’s characterisation of hylozoism resembles her tripartite distinction between substances. Rooted in Strabo, Cudworth observed that this instantiation of atheism had been “of late *Awakened* and *Revived*, by some, who were so

⁴⁴² Giglioni, “Francis Glisson’s Notion of Confœderatio Naturæ in the Context of Hylozoistic Corpuscularianism” (2002), 242. The fullest study of Glisson’s natural philosophy is now Hartbecke, *Metaphysik und Naturphilosophie im 17. Jahrhundert: Francis Glissons Substanztheorie in Ihrem Ideengeschichtlichen Kontext* (2006).

⁴⁴³ See Henry, “Medicine and Pneumatology: Henry More, Richard Baxter, and Francis Glisson’s *Treatise on the Energetic Nature of Substance*” (1987), 21.

⁴⁴⁴ See Cudworth, *The True Intellectual System of the Universe* (London, 1678), 137.

sagacious, as plainly to perceive, that the *Atomick Form* could never doe their business”.⁴⁴⁵ Hylozoism is, then, a substance theory for thinkers such as Cavendish who were disillusioned with atomism.

Despite Cudworth’s condemnation of hylozoism as an atheistic substance theory, it is difficult to grasp why Glisson’s ideas should be characterised in such a way. While Glisson sought to distinguish spiritual substances from the self-moving matter of the natural world, he affirmed the existence of a transcendent God, angels, demons, and incorporeal souls according to the letter of scripture.⁴⁴⁶ For her own part, Cavendish focused her energies on physiological and philosophical questions in *Philosophicall Fancies*, rather than theological issues. There is one moment, however, where she writes that “*Innate Matter* is a kind of *God*, or *Gods* to the *dull part of Matter*, having power to forme it, as it please: and why may not *every degree* of *Innate Matter* be, as severall *Gods*, and so a *stronger Motion* be a *God* to the *weaker*, and so have an *Infinite*, and *Eternall Government*?”⁴⁴⁷ In this passage, Cavendish compares innate matter to “gods” because God put rational and sensitive matter into motion, and, in turn, this innated matter animates the dull parts. In keeping with her defiance of a closed and self-contained *cogito*, she considered a hierarchy of mutually reliant pieces of matter to organise the natural world.

Cavendish did not mean for this passage to transmute matter into so many gods, and she goes to lengths to assuage any doubt about her theological views and to affirm her orthodoxy in her post-Restoration publications, as we will see in the next chapter. Yet

⁴⁴⁵ *True Intellectual System*, A8r.

⁴⁴⁶ See Giglioni, “Anatomist Atheist? The ‘Hylozoic’ Foundations of Francis Glisson’s Anatomical Research” (1996), 120.

⁴⁴⁷ *Philosophicall Fancies*, 12.

her simile does come dangerously close to justifying Cudworth's fear that if matter is capable of self-motion and knowledge, then a self-aware, transcendent God beyond the material world would become redundant.⁴⁴⁸ Cudworth deemed hylozoism to be a nonsensical substance theory because it attributes life and knowledge to each piece of matter instead of one common principle that governs the entirety of the natural world.⁴⁴⁹ This is an objection to Cavendish's belief that the natural world consists of a multiplicity of mutually reliant material principles—that function through shared sympathies—rather than being a closed system that is preserved through a universal force. We will see in the next chapter that Cavendish desired to retain a strict distinction between physics and metaphysics, but the use of such a metaphor in *Philosophicall Fancies* without a thorough theological discussion was a dangerous manoeuvre.

Perhaps as a means of playing down the potentially explosive implications of her earlier conceit, Cavendish does make a gesture towards unifying her material spirits through a transcendent God in her final poem. In this poem, "The diatical Centers", Cavendish writes: "Great God, from thee all infinites doe flow; / And by thy power from thence effects doe grow: / Thou orderst all degrees of matter, just / As 'tis thy will & pleasure move it must".⁴⁵⁰ Rather than material spirits, here God is the cause of all natural effects. She appeals to a kind of Neo-Platonic emanationism, with the Latin "*emanare*" meaning "to flow from".⁴⁵¹ Cavendish may very well have arrived at her ideas on emanationism through her reading of *Ternary of Paradoxes*, in which Charleton refers to a "spiritual emanation" that executes "the mandates of the *will*, concerning the

⁴⁴⁸ *True Intellectual System*, 106.

⁴⁴⁹ Giglioni, "Francis Glisson's Notion of Confœderatio Naturæ", 259.

⁴⁵⁰ *Philosophicall Fancies*, 93.

⁴⁵¹ See *OED*, "Emanation", n., 1a.

magnetism of all Creatures”. He proceeds to connect it to the “*superiority* of man over all other sublunary bodies, will receive illustration, and shine bright in the eye of our understanding”.⁴⁵² Emanationism is thus a top-down movement: an immaterial principle flows from a transcendent God, to the incorporeal soul of man, then through the lower animals, and finally down to matter itself, sustaining the shape of the Platonic *scala naturae*.⁴⁵³ Yet this notion jars with the rest of *Philosophicall Fancies*, according to which vital spirits are extracted from inert matter to form all figures in the natural world, aligning humans not with the divine but other animals.

Cavendish may well have believed that emanationism permitted her to postulate an immaterial God that unified her plurality of material spirits without rigorously defining the nature of this unification, thus skirting charges of atheism while keeping her other philosophical and physiological ideas intact. In this regard, it is interesting that Glisson also believed that his energetic matter arose through divine emanation.⁴⁵⁴ Both Cavendish and Glisson were drawing on the likes of van Helmont in their belief that God infused matter itself with the vital capacity for self-activity. But, in contrast to van Helmont, they saw the inscription of an immaterial substance into matter as redundant. Indeed, already in “The diatical Centers” Cavendish doubts whether we can know anything of this great God from which an infinite number of spirits flow. Foreshadowing her Reformed orthodoxy that we will look at in the next chapter, Cavendish maintained that vainglorious self-deception misguided anyone who supposed that they had knowledge of God beyond what was revealed in scripture. Far from exhibiting a thought

⁴⁵² *Ternary of Paradoxes*, 87.

⁴⁵³ Plotinus, *Ennead* V.i.6. See Louth, *The Origins of the Christian Mystical Tradition: From Plato to Denys* (2007), 35-50 and O’Meara, “The Hierarchical Ordering of Reality in Plotinus” (1996). For a relevant early modern discussion, see Mercer, “Platonism in Early Modern Natural Philosophy” (2012).

⁴⁵⁴ See French, *William Harvey’s Natural Philosophy*, 289-90.

out theology, her final poem is a prayer of sorts in which she asks “pardon Lord, for what I here now speak, / Upon a guess, my knowledge is but weak”.⁴⁵⁵ If God is the cause of all natural effects—and natural philosophy is the search for causes, as it is for Cavendish—then knowing God would be the best way to understand the natural world. It follows that if God’s relationship to the natural world can only be guessed at, then there is not much hope for apprehending the causes of natural effects. Unable to account for how a Neo-Platonic God unifies her material spirits, Cavendish’s collation of sources from the medical tradition stretches to its breaking point. The problematic relationship between God and the natural world in *Philosophicall Fancies* finally forced Cavendish to perceive the limits of her earlier eclecticism.

2.3. Reading Cavendish’s Matter: Nehemiah Grew

In conclusion, we will move forward—both in terms of Cavendish’s publications and her reception—to how a later contemporary engaged with her early work. Continuing the critique that Cavendish undertook soon after the appearance of Descartes’ *Les passions de l’âme*, it is well known that vital substance theories were the focus of a late seventeenth and early eighteenth-century resistance to mechanist explanations by thinkers as diverse as Baruch Spinoza, Pierre Bayle, and Gottfried Leibniz.⁴⁵⁶ As we have seen, seeds of this discourse were already evident in Glisson’s later publications and in Cudworth’s *True Intellectual System*. Another noteworthy figure that developed a vital substance theory during this period was Nehemiah Grew: the English physiologist, plant

⁴⁵⁵ *Philosophicall Fancies*, 93.

⁴⁵⁶ See Watson, *The Downfall of Cartesianism 1673-1712: A Study of Epistemological Issues in Late Seventeenth-Century Cartesianism* (1966); Yolton, *Thinking Matter: Materialism in Eighteenth-Century Britain* (1983); and Thomson, *Bodies of Thought: Science, Religion, and the Soul in the Early Enlightenment* (2008).

anatomist, and successor to Henry Oldenburg as secretary of the Royal Society. Among the Sloane manuscripts in the British Library is a commonplace book by Grew.⁴⁵⁷ Revealing that Cavendish and Grew shared many literary and philosophical concerns, this book contains notes on George Sandys' popular piece of travel literature, *Sandys Travels*, and "A short account of Thales, Solon, Socrates, and other ancient philosophers, and their different systems of philosophy" based on Thomas Stanley's *History of Philosophy*, which we will see in 4.2 was a valuable source for Cavendish.⁴⁵⁸ Immediately after these entries, there is another titled "The Marchionesse of Newcastle her philosophy compendium", containing excerpts from *Philosophical and Physical Opinions*.⁴⁵⁹ In current scholarship, minimal attention has been dedicated to the ways that Cavendish's contemporaries read and responded to her philosophical publications. But this compendium enables us to see what aspects of Cavendish's thought caught the eye of a practising physician, and how he manipulated, emended, and reacted to the themes that he found in her work. At least implicitly, it also clarifies some ways that Cavendish's philosophy relates to the likes of Glisson and Cudworth. While the commonplace book and its entries are undated, it seems that Grew read Cavendish's text in the years leading up to his publication of *The Anatomy of Plants* in 1682. At this time, Grew was developing his own substance theory, and his corresponding notion of the relationship between plants and animals. He was fascinated enough by Cavendish's belief that the

⁴⁵⁷ See BL, Sloane MS 1950. William Le Fanu has noted the existence of "MS 1950 Verses and Phrases (undated)", but simply refers to it in passing among "papers written by Grew, but not directly connected with his publications" (*Nehemiah Grew: A Study and Bibliography of his Writings* (1990), 108).

⁴⁵⁸ See Sloane MS 1950, ff. 8r-12v and 13r-34v.

⁴⁵⁹ For a fuller discussion of this compendium, see Begley, "'The minde is matter moved': Nehemiah Grew on Margaret Cavendish" (2017).

natural world functions through rational and sensitive spirits to take detailed notes on *Philosophical and Physical Opinions*.

In the preface to *Anatomy of Plants*—which is a compilation of lectures that were delivered before the Royal Society between 1671 and 1677—Grew declares that “the Ascent of the Sap, the Distribution of the Aer, the Confection of several sorts of Liquors, as Lymphas’s, Milks, Oyls, Balmes; with other parts of Vegetation, are all contrived and brought about in a Mechanical way”.⁴⁶⁰ He also argues in a paper on the “Principles of Bodies” read before the Royal Society in 1674 that the universe functions through “two Modes of Atomes, viz. their Size and Figure”.⁴⁶¹ Despite forwarding a theory of quantitative, mechanical atomism, Grew asserts in his preamble that the chief influence on the development of his plant anatomy was Glisson, and especially his 1654 *Anatomia Hepatis*. By now, it will come as no surprise that Glisson argues here that “the natural spirits become vital, and the vital animal, by eminent impressions. And thus every plant has his peculiar spirit; though they all agree in their common nature”.⁴⁶² Yet, rather than prioritising Glisson’s substance theory, the lengthy passage from *Anatomia Hepatis* that Grew quotes from states that the dissection of plants, like that of animals, can yield detailed knowledge of their parts and functions.⁴⁶³ As Grew lays bare in his prefatory dedication to Charles II in *Anatomy*, his own work was designed to show that “there are those things within a Plant, little less admirable, than within an Animal. That a Plant, as

⁴⁶⁰ Grew, *The Anatomy of Plants. With an Idea of a Philosophical History of Plants. And Several Other Lectures, Read before the Royal Society* (London, 1682), A1v. On Grew’s plant anatomy, see Karafyllis, “Das Geschlecht der Pflanzen in Antike und Früher Neuzeit: Plurale Transformationen antiker Wissensordnungen in den pflanzenanatomischen Werken von Marcello Malpighi (Bologna) und Nehemiah Grew (London)” (2010).

⁴⁶¹ *Anatomy of Plants*, 224.

⁴⁶² See Glisson, *From Anatomia Hepatis (the anatomy of the liver)*, 1654, ed. by Cunningham (1993), 77.

⁴⁶³ “Plantae quoque in hunc censum (sc. *Anatomicum*) veniunt; variâ enim Partium texturâ, & differentiis constant: & proculdubio, ex acurata earundem dissectione, utiles valde observationes nobis exurgerent” (*Anatomy of Plants*, A2v).

well as an Animal, is composed of several Organical Parts”.⁴⁶⁴ Due to this interest, Grew concentrates on Cavendish’s substance theory and its relationship to her notion of humans, animals, and plants in his compendium.

It is of particular note that Grew broadly organised the headings in his compendium to reflect the Aristotelian understanding of the *scala naturae*. Moving from what he conceived of as the smallest and least organised parts of the universe to the largest and most intricate, Grew begins his compendium by investigating the unobservable “Matter & Motion their Propertys” before turning to the observable elements. From there, Grew ascended the scale of being, starting with “Vegetables”, then “Animals”, before eventually arriving at “Mind” and “Thought”. He concludes with a transcription of “The diatical Centers”. By shaping his compendium in this manner, Grew was partly applying his humanist training to Cavendish’s vernacular publication, for such an arrangement reflects the organisation of many early modern introductory textbooks to natural philosophy.⁴⁶⁵ More than blindly applying an established template, however, Grew would have considered the structure of his headings to facilitate his apprehension and recollection of the ideas in Cavendish’s work. He rightly sees that Cavendish touches on many Aristotelian topics as she develops a vital substance theory that foregrounds the qualitative motions and properties of matter, and that her notion of the relationship between species is closer to Aristotle than Plato. Not only does Grew’s compendium elucidate both his interpretation of Cavendish’s text and his own intellectual

⁴⁶⁴ *Anatomy of Plants*, A1v. On Grew’s comparative anatomy, see Delaporte, *Nature’s Second Kingdom: Explorations of Vegetality in the Eighteenth Century* (1982) and Cole, *History of Comparative Anatomy: From Aristotle to the Eighteenth Century* (1994).

⁴⁶⁵ See Blair, *The Theatre of Nature: Jean Bodin and Renaissance Science* (1997), 30-9 and 65-81.

presuppositions, but it also reveals that he read through *Philosophical and Physical Opinions* multiple times, actively evaluating and re-arranging her ideas.

Grew's desire for organisation led him to produce a compendium that displays a stricter hierarchy of life forms than is evident in Cavendish's original work. This is illustrated by the fact that Grew notes under the heading "Vegetables" that there is "A question whether they [vegetables] have not sense since they may possibly have with Animals the same Matter & Motion".⁴⁶⁶ Despite categorising this idea under "Vegetables", Grew derived it from a section of Cavendish's work titled "Of the Animal Figure". Whereas Cavendish's categorisation erodes any simple distinctions between plants and animals, Grew's headings implicitly re-establish Aristotle's ordering of reality even as they acknowledge that Cavendish complicates the principles upon which such an organisation is premised. Proceeding from his note on vegetables to the heading "Animals", Grew records that "Touch, Is the generall sense of the whole body".⁴⁶⁷ But Cavendish held that touch—arising from the motions of sensitive spirits—can be ascribed to plants because they have "pores" and some of them can even react to external stimuli.⁴⁶⁸ Advancing upon her discussion in *Philosophicall Fancies*, she thus states in a section in *Philosophical and Physical Opinions* "Of Motion, and Matter": "Why may not *Vegetables* have *Light, Sound, Taste, Touch*, as well as *Animals*, if the same *kinde* of *motion* moves the same kinde of *matter* in them?".⁴⁶⁹ While plants and animals may not feel in the same manner—and there is already an array of feelings among the brute species—they cannot be riven along the lines of rationality and sensitivity. For

⁴⁶⁶ Sloane MS 1950, ff. 37r.

⁴⁶⁷ Sloane MS 1950, ff. 37r.

⁴⁶⁸ *PPO*, 46.

⁴⁶⁹ *PPO*, 23.

Cavendish, the motions of sensitive and rational matter as they frame and move through figures determine the functions of each being and the degree to which their bodies work according to the normative behaviours of their species. Replacing Aristotle's tripartite soul, Cavendish appeals to the "figure" or physical shapes of beings rather than an abstract form that arbitrarily distinguishes between modes of life and says little about the material functions of a given plant or animal.

Even so, Grew was certainly arrested by the theme of plant sensitivity, and he engages with this topic in the two major categories that he creates in the middle of his compendium, one on the "Contractions of Lines" and the other on the "Extenuations of Fluid". Isolating Cavendish's emphasis on dilation and contraction—which she further develops in her later publications, as we will see in the next chapter—Grew sifts through her work for moments when she uses these motions to account for the functions of plants and animals and the transformations of elements and metals. Under the section on contraction, Grew documents that "Oyle" is "partly of the nature of Fire & partly of Water. Extenuation makes it liquid & fluid; Extenndeing circles, liquid & moyst; the composition of those Circles of poynts, inflammable & burning; which when fire meets it settts those poynted parts at liberty".⁴⁷⁰ Here he underscores Cavendish's belief that oil is of an intermediary nature, capable of contracting into the points that make fire and extenuating into the circles that compose water. In a lecture delivered during 1672 or 1673, Grew expresses ideas similar to those found under the heading "Oyle" from his compendium:

Oily parts of the Sap, are so exceedingly attenuated by the Aery Ferment contained in these Vessels; that they are, for the most part, so far immersed in the Spirit, or mixed therewith, as not, by being collected in any considerable Body, to

⁴⁷⁰ Sloane MS 1950, ff. 36r.

be distinguishable from it. And the affinity that is betwixt *Spirits* and *Oils*, especially *Essential*, is manifest: Both are very inflammable.⁴⁷¹

As this passage suggests, despite believing that the natural world functions through “mechanical” atoms, Grew (like Descartes) appeals to vital principles in his discussion of plants and animals. Arguing that both elements and spirits interact within plants, Grew uses the notion that vital spirits can extend the circular shapes of oil particles (making them narrower) to account for the role of oil in the circulation of sap. While the aerodynamic quality of contracted oil causes it to be propelled through the veins of plants, it also makes it highly flammable since fire particles are sharp and pointed.

Most probably, Grew gleaned this concept from Glisson or Cavendish (or at least the Harveian tradition from which they were drawing), with there being an obvious analogy between the vital spirits that cause the circulation of the blood in animal bodies and the circulation of oily sap in vegetables. Developing these ideas, Glisson is perhaps most famous for his theory of “irritability”, or the notion that fibres move in a rhythmical alternation of contraction and relaxation.⁴⁷² To Glisson’s mind, irritability transforms the natural energy that pervades plants and animals into sensation, since there is no absolute distinction between vital energy, the perception of matter, and the sensation and intellectual to which this gives rise. In line with her idea that there are both rational and sensitive spirits in plants, Cavendish also writes that “the *Sap* in *Vegetables* may be of the same *substance*, and *degree* of the *Brain*”.⁴⁷³ We will see the extent to which vital irritability grew out of the Aristotelian tradition of *minima naturalia* more fully in the

⁴⁷¹ *Anatomy of Plants*, 93-4.

⁴⁷² On Glisson and irritability, see Pagel, “Harvey and Glisson on Irritability with a Note on van Helmont” (1967); Temkin, “The Classical Roots of Glisson’s Doctrine of Irritation” (1964); Rey, “Metaphysical Problems in Francis Glisson’s Theory of Irritability” (2014); and Giglioni, “What Ever Happened to Francis Glisson? Albrecht Haller and the Fate of Eighteenth-Century Irritability” (2008).

⁴⁷³ *PPO*, 23.

next chapter. But the complication of Aristotle's tripartite soul and the emphasis on the vital responsiveness of plants by the likes of Cavendish certainly laid the groundwork for figures such as Grew to flesh out the anatomic relationship between plants and animals and to advance notions such as the vital movement of sap.⁴⁷⁴

It remains the case, however, that the postulation of sensitive and rational matter was of a particular historical moment. Even as Grew drew on Cavendish's ideas regarding plant sensitivity, when he developed a vital substance theory in his 1701 *Cosmologia Sacra* he forwarded the thesis that "there is a Vital Substance in Nature, distinct from Body". He proceeds to argue that a close analysis of the natural world verifies that immaterial principles account for "Vegetable Life, Sense, and Thought".⁴⁷⁵ This tripartite classification of life forms—which is central to the substance theory of *Cosmologia Sacra*—might initially appear to reflect Cavendish's distinction between dull, sensitive, and rational matter. Yet Grew makes it clear that he deemed "Vegetable Life" to be an incorporeal and vital force that is "infused into all the Parts of Corporeal Nature; but more remarkably into Plants and Animals".⁴⁷⁶ By contrast, we have seen that Cavendish considered vegetables to contain rational and sensitive matter, with dull matter being a raw material base that this matter kept in constant motion.

In tension with Cavendish's "innated matter", Grew held that "Intellection, which is one Species of Life, is absolutely distinct from Sense".⁴⁷⁷ In developing his ideas on immaterial vitality, Grew in fact goes to lengths to distinguish his substance theory from

⁴⁷⁴ On the historical movement in which Cavendish is partaking, see Webster, "The Recognition of Plant Sensitivity by English Botanists in the Seventeenth Century" (1966).

⁴⁷⁵ Grew, *Cosmologia Sacra: Or a Discourse of the Universe as it is the Creature and Kingdom of God* (London, 1701), 34. See Garrett, "Vitalism and Teleology in the Natural Philosophy of Nehemiah Grew (1641-1712)" (2003).

⁴⁷⁶ *Cosmologia Sacra*, 35.

⁴⁷⁷ *Cosmologia Sacra*, 34.

the kind forwarded by Cavendish. He argues that “Were Life, an immediate Adjunct of Body, as Motion is; then, as all sorts of Bodies, are capable of all sorts of Motion; so they would be capable of all sorts of Life; even of Intellection it self”.⁴⁷⁸ In his critique of rational and sensitive matter, Grew was relying heavily on Cudworth.⁴⁷⁹ The great distance between the headings “Matter & Motion their Propertys” and “Mind” implies that Grew was already developing his own idea of an incorporeal, vegetable life at the time that he was composing his compendium. Grew derived his heading “Mind” from Cavendish’s passage “Of Matter and Motion”, in which she writes that “there is but *one Matter*, thinner and thicker which is the *Form*, and the *Minde*, that is, *Matter moving*, or *Matter moved*”.⁴⁸⁰ Abstracting from this passage to write the shortest section in his compendium, Grew simply states that “The minde is matter moved”.⁴⁸¹ While the notion of a passive mind clashes with Cavendish’s idea that thought is inseparable from the movements of innated matter, it accords with Grew’s later position that intellection occurs as immaterial principles direct otherwise inert matter. At the most basic level, it is this distinction that led Grew to revise and critique the subject matter of Cavendish’s work at least as much as he allowed it to move his mind.

Consistent with his own intellectual orientation, the only part of *Philosophical and Physical Opinions* that Grew transcribed in its entirety is “The diatical Centers”. Insofar as it is of literary merit, transcribing the whole of the poem (in order to capture its measure and motion) is not remarkable. But the completeness of his transcription also has philosophical and theological ramifications. The starting point for Grew’s discussion of

⁴⁷⁸ *PPO*, 8 and *Cosmologia Sacra*, 34.

⁴⁷⁹ See Andrault, “What is Life? A Comparative Study of Ralph Cudworth and Nehemiah Grew” (2014).

⁴⁸⁰ *PPO*, 1.

⁴⁸¹ Sloane MS 1950, ff. 37r.

his immaterial vitality is his belief that as God “is the Cause of all other Beings, is the most Substantial Being: is Himself a Substance Vital and Incorporeal”.⁴⁸² For Grew, vegetable life is incorporeal precisely because it is an extension of God that permeates the natural world. Although he does not explicitly summon the doctrine of emanationism, his notion that God’s immaterial vitality puts the natural world into motion is much closer to Cavendish’s discussion of emanations in her final poem than the bottom-up extraction of vitality from dull matter that she discusses throughout the rest of her work. In this respect, it is telling that Grew transcribes a poem about unified perfection in its totality, yet neglects the portion of *Philosophical and Physical Opinions* in which Cavendish presents her infinite quantity of material spirits or “gods”. Vital matter theories endured and Grew remained intrigued by Cavendish’s ideas on the shared matter and parallel functions of plants and animals, but her more peripheral material pluralism appeared impalpable in the world of “our Learned Mathematick Professor Mr. *Newton*”.⁴⁸³ It was increasingly held that a transcendent God and some universal forces such as gravity were necessary to elude the position that each piece of matter is either intelligent and god-like or absolutely autonomous and anarchically plural.⁴⁸⁴ Rather than distinguishing the material and the incorporeal spheres and endowing matter with vitality to challenge Descartes on his own terms, it was believed that the certainty after which he pursued required the suffusion of an immaterial force throughout the natural world.⁴⁸⁵

Under these shifting intellectual circumstances, Glisson’s ideas in the years

⁴⁸² *Cosmologia Sacra*, 31.

⁴⁸³ *Cosmologia Sacra*, 38.

⁴⁸⁴ See Macpherson, *The Political Theory of Possessive Individualism: Hobbes to Locke* (1964) and Freudenthal, *Atom und Individuum im Zeitalter Newtons: Zur Genese der mechanistischen Nature- und Sozialphilosophie* (1982).

⁴⁸⁵ The most thorough study of this movement is now Guicciardini, *Isaac Newton on Mathematical Certainty and Method* (2009).

immediately following his lectures and publications experienced a similar (if more widespread) fortune to those of Cavendish. While his natural philosophy was considered overly intricate and his material vitalism deemed theologically inadequate, his work was mined for ideas and appropriately tempered.⁴⁸⁶ Having said that, their corresponding receptions occurred for contrasting reasons. An important institutional figure, Glisson contributed to his own demise by writing of recondite speculative matters in difficult Latin—fraught with erudite allusions and Scholastic jargon—in an increasingly anti-Aristotelian milieu that favoured the vernacular. By contrast, standing outside the learned institutions of her day, Cavendish wrote in relatively simple English and her early texts are devoid of citations. Both peripheral thinkers in their own ways, it is perhaps no coincidence that the natural philosophies of Cavendish and Glisson emphasised pluralistic organisation rather than unity around a stable centre. Developing a substance theory that only comes to further resemble Glisson's, we will see in subsequent chapters that Cavendish found an intellectual niche by embracing and defending Aristotelian thought, at the very moment that it was most under siege by thinkers in the Royal Society. Already in her early physiological output, however, Cavendish drew on a wide array of sources to recover a predominantly ancient understanding of animal life against Descartes' physiology. With the assistance of Grew's compendium, we have also been able to gain a richer and more historically sensitive outlook on her publications and the context in which they materialised and subsisted.

⁴⁸⁶ See Giglioni, "What Ever Happened to Francis Glisson?".

Chapter 3. Theology: Aristotle and Reformed Orthodoxy

In *Philosophical Letters*, Cavendish retained her position from *Philosophicall Fancies* and *Philosophical and Physical Opinions* that rational and sensitive matter cause the natural world to function. Yet, rather than calling her substance “spirits”, by 1664 she exclusively referred to spirits as either “supernatural” or “immaterial”. The stated reason for this shift is that if she were to discuss both immaterial and material spirits in the same work, then her writing could be subject “to misapprehensions and mis-interpretations; to prevent those, I thought it fitter to leave out the word *Spirits* in the second, as also in the last Edition of my named Book of *Philosophy*, lest my Readers should think I meant Immaterial Spirits”.⁴⁸⁷ As this suggests, not only did Cavendish abstain from mentioning material spirits in *Philosophical Letters*, but she also removed all references to spirits for her 1663 edition of *Philosophical and Physical Opinions*. These measures were of vital importance because any theological infelicities were frowned upon as a threat to the established order following the Restoration of the Church of England in 1660 and the 1662 Act of Uniformity. Overlooking her publication chronology, however, scholars have continually regarded Cavendish as “an odd sort of materialist”.⁴⁸⁸ Given that she has usually been read as a heterodox material monist of the Hobbesian variety, it is curious that one of Cavendish’s greatest concerns in *Philosophical Letters* is that she would appear to be precisely the opposite: an enthusiast who considered the natural world to

⁴⁸⁷ *Philosophical Letters*, 233.

⁴⁸⁸ Some recent examples of this discourse are Duncan, “Debating Materialism: Cavendish, Hobbes, and More” (2012); Goldberg, *Seeds of Things*, 122-78; Hequembourg, “The Poetics of Materialism in Cavendish and Milton” (2014); and Wilkins, “Exploding Immaterial Substances: Margaret Cavendish’s Vitalist-Materialist Critique of Spirits” (2016). An analytic account of Cavendish’s belief in the immaterial can now be found in Cunning, *Cavendish*, chapter 3.

function through the actions of incorporeal spirits.⁴⁸⁹ Contrary to the current scholarly consensus, this chapter demonstrates that *Philosophical Letters* expresses the prototypical views of a Reformed Anglican: it supports the stability of the post-Nicene creeds, accentuates the fissure between Godly perfection and the fallen state of humankind, and foregrounds salvation by faith rather than works.⁴⁹⁰

Cavendish frames *Philosophical Letters* as an epistolary exchange with a fictitious female correspondent, but her letters are potent critiques of passages in the works by a number of her contemporary male philosophers that she finds dangerous or unpersuasive. Among these, she was especially anxious to distance herself from the unorthodox immaterialism of the Cambridge divine, Henry More.⁴⁹¹ Getting wind of Cavendish's publication, More wrote in a letter to his female pupil, Anne Conway, in March 1664 that "the Marchionesse of Newcasde has in a large book confuted Mr Hobbs, Des Cartes, and myself, and (which will make your Ladiship at least smile at the conceit of it) Van Helmont also to boot".⁴⁹² A few months later, upon receiving *Philosophical Letters* and a newly republished edition of *Poems, and Fancies*, More again writes to Conway that

My Lady of Newcastle has sent two more Folios of hers to furnish my study, the one of poems, the other which is far the bigger, of letters wherein I am concern'd, above 30 of those letters being intended for a confutation of sundry passages in

⁴⁸⁹ On Cavendish's supposed heterodoxy, especially see Smith, "Claims to Orthodoxy: How Far Can We Trust Margaret Cavendish's Autobiography?" (2014) and Cottagnies, "Brilliant Heterodoxy".

⁴⁹⁰ In older historiography, the theological orientation discussed here was termed "Calvinist". For the use of the more historically accurate "Reformed" rather than "Calvinist" and a justification for the provided definition, see Muller, *After Calvin: Studies in the Development of a Theological Tradition* and Post-Reformation Reformed Dogmatics (2003), 63-102 and Hampton, *Anti-Arminians: The Anglican Reformed Tradition from Charles II to George I* (2008), especially 3-10.

⁴⁹¹ The only sustained attention to the relationship between Cavendish and More is Hutton, "Margaret Cavendish and Henry More" (2003).

⁴⁹² *The Conway Letters: The Correspondence of Anne, Viscountess Conway, Henry More, and their Friends, 1642-1684*, ed. by Nicolson and Hutton (1992), 234. On Cavendish and Anne Conway, see Clucas, "The Duchess and the Viscountess" and Hutton, "Anne Conway, Margaret Cavendish and Seventeenth-Century Scientific Thought" (1997).

my writings. She is by farr a more civill Antagonist then Dr Beaumont, I wish your Ladiship were rid of your headache and paines, though it were no exchange for those of answering this great Philosopher. She is affrayd some man should quitt his breeches and putt on a petticoat to answer her in that disguise, which your Ladiship need not.⁴⁹³

While More's position at Cambridge compelled him to respond to his fellow clergyman, poet, and Professor of Divinity, Joseph Beaumont, he did not deem it necessary to refute Cavendish. Instead, More proposed that Conway (as a woman outside of the universities) might get "rid of the headache" caused by Cavendish's objections. Although Conway does not appear to have taken up More's recommendation, we will see in the first part of this chapter that Joseph Glanvill, another of More's devotees, did involve Cavendish in a lengthy correspondence. In this exchange, Cavendish and Glanvill chiefly discuss theological topics, and especially the pre-existence of immaterial souls. Since Cavendish was reticent towards ruminating on "the Articles of our Creed, more then the Scripture expresses" as a layperson, minimal scholarly attention has been dedicated to her theological ideas.⁴⁹⁴ Yet it possible to reconstruct Cavendish's theological orientation by studying her objections to More in *Philosophical Letters*, her satirical discussion with immaterial spirits in *The Blazing World*, and her correspondence with Glanvill. Whereas More and Glanvill emerge as Arminians who relied heavily on the ideas of Plato and the pre-Nicene Church Fathers, we will see that Cavendish drew on Aristotelian-Scholastic sources to squarely situate herself within the tradition of Reformed Anglicanism.⁴⁹⁵

Using a heuristic distinction between the religious ideas that More derived from his cabalistic interpretation of scripture and the way that he adapted these to suit his

⁴⁹³ *The Conway Letters*, 237.

⁴⁹⁴ *Philosophical Letters*, 143.

⁴⁹⁵ On More's Platonic influences, see Dockrill, "The Fathers and the Theology of the Cambridge Platonists" (1982) and "The Heritage of Patristic Platonism in Seventeenth-Century English Philosophical Theology" (1997). Also see Quantin, "The Fathers in Seventeenth-Century Anglican Theology" (1997).

natural philosophy, the second part of this chapter concentrates on More's understanding of the natural world. I maintain that Cavendish ceased to revel in the ambiguity of "spirits" in *Philosophical Letters* largely because she sought to distinguish her substance theory from More's immaterial "Spirit of Nature". With her rejection of material spirits, she developed her third account of the fundamental particles composing the natural world: a theory of *minima naturalia*. Paramount to this revision were the competing interpretations of Aristotle that she found in Gideon Harvey's 1663 *Archelogia philosophica nova* and the 1653 translation of William Harvey's *De generatione* by the poet and physician, Martin Lluelyn: *Anatomic Exercitations, Concerning the Generation of Living Creatures*. While Cavendish continued to adapt the content of medical texts towards philosophical ends, her acceptance of theological dogmas constructively delimited the range of positions that she would defend. Meanwhile, she maintained that the endeavours of More and Glanvill to convert putative atheists by extending the domain of theology could not only cripple the Church but lead to an institutional compliance with the superstitious polytheism of the ancient poets.

3.1. The Nature of Spirits: Henry More and Joseph Glanvill

There were many ways to interpret the relationship between Aristotle and Plato during the seventeenth century, and we have seen that Cavendish derived her ideas on ancient philosophy from a broad spectrum of sources. But Meric Casaubon perhaps offers the purest example of the distinction between Aristotelian and Platonic philosophy and theology that is implemented in *Philosophical Letters*. In the preface to his popular 1659 *A True & Faithful Relation*—a transcription and critical edition of John Dee's supposed

communication with spirits—Casaubon writes that “*Aristotle* doth not acknowledge Spirits, he mentions them not in any place”. On Casaubon’s reading, Aristotle developed this position in reaction to Plato’s writings, which “are full of Prodigies, Apparitions of Souls, pains of Hell and Purgatory, Revelations of the gods, and the like”.⁴⁹⁶ Quoting from Book 1 of Aristotle’s *De Anima* and paraphrasing passages from his *Metaphysics*, Casaubon represents Aristotle as categorically distinguishing between material and divine substances, not believing “that it was the part of a Phylosopher to meddle with those things that no probable reason could be given of”. Conversely, he holds that Plato’s works are “too full of tales, for a Phylosopher”, precisely because he brought supernatural phenomena into the natural world.⁴⁹⁷ Drawing on this distinction, Casaubon shaped Dee as an over-enthusiastic Platonist.

That Cavendish was familiar with Casaubon’s *True & Faithful Relation* can be inferred from a section of *The Blazing World* in which immaterial spirits visit a character named the Empress, who is closely modelled on Cavendish herself. One of the first questions that she asks the spirits is “whether there were none that had found out yet the Jews’ Cabbala?”. In response, the Empress is told that though several thinkers have sought to unveil cabalistic secrets, “those that came nearest (although themselves denied it) were one Dr. *Dee*, and one *Edward Kelly*, the one representing *Moses*, and the other *Aaron*; for *Kelly* was to Dr. *Dee*, as *Aaron* to *Moses*”.⁴⁹⁸ While Dee only mentions a

⁴⁹⁶ Dee and Casaubon, *A True & Faithful Relation* (London, 1659), B1r. On Meric Casaubon, see Spiller, ‘Concerning Natural Experimental Philosophie’: Meric Casaubon and the Royal Society (1980). Necessary correctives can be found in Hunter, “Ancients, Moderns, Philologists, and Scientists” (1982) and especially Serjeantson, “Introduction”, *Generall Learning*. Also see Clucas, “Enthusiasm and ‘damnable curiosity’: Meric Casaubon and John Dee” (2006).

⁴⁹⁷ *A True & Faithful Relation*, B1r.

⁴⁹⁸ *The Blazing World*, 65. On the significance of the cabala during the seventeenth century, see Coudert, *The Impact of the Kabbalah in the Seventeenth Century: The Life and Thought of Francis Mercury van Helmont (1614-1698)* (1999).

“*CABALA of NATURE*” once in his dialogues, Casaubon’s table of contents labels many of Dee’s conversations with spirits as “Cabale”, and repeatedly styles Dee as one of those thinkers who came “into the world with *Cabalistical Brains*; their heads are full of mysteries; they see nothing, they read nothing, but their brain is on work to pick somewhat out of it that is not ordinary”.⁴⁹⁹ Cavendish’s emphasis on Dee’s “cabala” suggests that reading Casaubon’s edition had some bearing on her understanding of the Platonic predilection of the cabalistic mind: being based on a mysterious, incorporeal, and irregular outlook on the natural world.

While Cavendish mentions Dee periodically in *Observations* and *The Blazing World*, extrapolating from her critique of More in *Philosophical Letters* allows us to gather that the latter was her chief satirical target. The parallels between Cavendish’s critique of More and Casaubon’s approach to Dee, however, only further reveal that they were working from similar philosophical and theological orientations. Cavendish felt vindicated in shaping More as both a cabalist and a spiritual Platonist because the preamble to his 1659 *Immortality of the Soul* upbraids Aristotle for resisting the prerogative of “the *Pythagoreans, Platonists, Jewish Doctours, and the Fathers* of the Church” in denying “the existence of *Daemons* in the world”.⁵⁰⁰ Echoing Casaubon’s assessment of Plato, she retorts that More’s demonology and his extended discussion of immaterial spirits are full of more “Poetical Fictions, then Rational Probabilities”.⁵⁰¹ From the outset of *Philosophical Letters*, she takes a very different approach to More by seeking to “meerly go upon the bare Ground of *Natural Philosophy*”, not blending

⁴⁹⁹ *A True & Faithful Relation*, 65 and C4r.

⁵⁰⁰ More, *The Immortality of the Soul* (London, 1659), B1r.

⁵⁰¹ *Philosophical Letters*, 217. See Vermeir, “Imagination between Physick and Philosophy: On the Central Role of the Imagination in the Work of Henry More” (2008).

“Divinity with it, as many Philosophers use to do, except it be in those places, where I am forced by the Authors Arguments”.⁵⁰² When More “forces” her to discuss the divine, Cavendish continually takes recourse in the Aristotelian position that “supernatural and natural effects” cannot “be mixt together, no more then material and immaterial things or beings”.⁵⁰³ For this reason, near the end of her rejoinder to More, she explicitly writes to her fictional correspondent that “you may plainly see, *Madam*, that I am no Platonick”.

Conceiving of Platonic philosophy as inextricably entwined with poetic fancies, Cavendish feels compelled to clarify that she is not composing an “invective against Poetical Fancies; for that I am a great lover of them, my Poetical Works will witness; onely I think it not fit to bring Fancies into Religion”.⁵⁰⁴ Yet even this statement must be taken with a tinge of irony. Between 1642 and 1647, More published three volumes of poetry: *Psychodia Platonica*, *Democritus Platonissans*, and *Philosophicall Poems*.⁵⁰⁵ In the first of these, More alleges that he was overtaken by a “Platonick rage” that allowed him to unearth “Plato’s hid Philosophie”.⁵⁰⁶ In hopes of both masking and suppressing this enthusiastic disposition, he spurned heavenly madness in his 1662 *Enthusiasmus Triumphatus*, finding himself unable to imagine “how that Fanatick spirit can be better met withall, then by slighting and deriding it”.⁵⁰⁷ For all his resolve, Cavendish construed

⁵⁰² *Philosophical Letters*, 3.

⁵⁰³ *Philosophical Letters*, 11.

⁵⁰⁴ *Philosophical Letters*, 219.

⁵⁰⁵ The most important study of the poems is Jacob, *A Platonick Song of the Soul* (1998). Also see Jacob, “Henry More’s *Psychodia Platonica* and its Relationship to Marsilio Ficino’s *Theologia Platonica*” (1985); Staudenbaur, “Galileo, Ficino, and Henry More’s *Psychathanasia*” (1968); and Gorman, “Allegorical Analogies: Henry More’s Poetical Cosmology” (2017).

⁵⁰⁶ More, *Psychodia Platonica: or A Platonick song of the Soul* (London, 1642), 1.

⁵⁰⁷ More, *Enthusiasmus Triumphatus, or, a Discourse of the Nature, Causes, Kinds, and Cure, of Enthusiasm* (London, 1656), A4v. See Williamson, “The Restoration Revolt Against Enthusiasm” (1933); Burnham, “The More-Vaughan Controversy: The Revolt Against Philosophical Enthusiasm” (1974); Fouke, *The Enthusiastical Concerns of Dr. Henry More: Religious Meaning and the Psychology of Delusion* (1997); Crocker, “Mysticism and Enthusiasm in Henry More” (1989); and Hutton, “Iconism, Enthusiasm and Origen: Henry More Reads the Bible” (2006). More generally, see Heyd, “*Be sober and*

his persistent recourse to immaterial spirits in the natural world as a remnant of his Platonic enthusiasm. As we saw in 1.1, she reproached the likes of Chapman (following Ficino) for his belief in a *furor poeticus* and his Platonic approach to mythology and the natural world as early as 1653. Perhaps calling attention to this continuity in her thought—as opposed to More’s pretences to intellectual overhaul—Cavendish sent him both *Poems, and Fancies* and *Philosophical Letters*.

Despite repudiating poetic enthusiasm, More could not in fact wholly rid himself of the notion that religious adepts could exhume privileged routes to the divine. His 1653 *Conjectura Cabbalistica* was to outline just such a shortcut to pristine knowledge.⁵⁰⁸ Rather than engaging with the *Zohar* or any other real cabalistic material, More’s cabala expounds a method of scriptural interpretation according to which Genesis is subjected to a tripartite reading: literal (the “Literal Cabbala”), natural philosophical and metaphysical (the “Philosophick Cabbala”), and mystical (the “Moral Cabbala”). Responding more fully to More’s exegeses in her 1668 republication of *The Blazing World*, Cavendish’s spirits wryly recognise that some thinkers have considered the cabala to be “meerly Traditional, others Scriptural, some Literal, and some Metaphorical”. While More held that only a philosophical-allegorical reading of Genesis could disclose divine truth, Cavendish did not believe that he could truly discriminate between his variegated modes of interpretations. As her spirits proceed to announce, in practice these cabalists provide “partly a Traditional, partly a Scriptural, partly Literal, [and] partly Metaphorical”

reasonable”: *The Critique of Enthusiasm in the Seventeenth and Early Eighteenth Centuries* (1995).

⁵⁰⁸ On More and the cabala, see Schulze, “Der Einfluss der Kabbala auf die Cambridger Platoniker Cudworth und More” (1965); Coudert, “A Cambridge Platonist’s Kabbalist Nightmare” (1975); Hutton, “Henry More, Anne Conway and the Kabbalah: A Cure for the Kabbalist Nightmare?” (1999); and Brown, “Leibniz and More’s Cabbalistic Circle” (1989). The most thorough account can now be found in Levitin, *Ancient Wisdom*, 113-229.

interpretations.⁵⁰⁹ Scoffing at the exclusivity of More's "philosophical" approach to scripture, Cavendish's spirits decisively respond to the question whether it is "a sin then not to know or understand the Cabbala?" by asserting that God is "so just, that he will never damn the ignorant, and save onely those that pretend to know him and his secret Counsels by their Cabbala's".⁵¹⁰ While recent studies have argued that Cavendish was enchanted by Jewish cabalistic material, it should now be clear that she rather critiqued More's hermeneutics and the cabalistic mindset that Casaubon associated with Plato from a philosophical and theological if not a historical perspective.⁵¹¹

It is notable in this regard that Cavendish not only conceived of More's cabala as closer to poetry than theology, but she also deemed it to be undergirded by a fictitious understanding of history. Tracing a Pythagorean-Platonic genealogy for his cabala, More maintained that Pythagoras obtained his ideas on themes such as the incorporeal soul and God from Egypt or directly from the Jews whose exegesis came from Moses, the author of the Pentateuch. Cavendish indicates her reservations towards the veracity of More's history when the immaterial spirits refer to it as a "Romancical Cabbala", since a romance was the most fictitious genre of "history" in early modern parlance.⁵¹² Upending More's notion that Platonic and Pythagorean philosophy had its origins in a "Philosophick *Cabbala* of *Moses*", Cavendish reckoned that his Platonic enthusiasm inspired his scriptural interpretation.⁵¹³ Instead of subjecting it to rigorous historical scrutiny—which she hardly considered it to warrant—Cavendish couched her critique of

⁵⁰⁹ Cavendish, *The Blazing World* (London, 1668), 67.

⁵¹⁰ *The Blazing World*, 68.

⁵¹¹ My argument that Cavendish's cabalistic discussion in *The Blazing World* is critically responding to More with three recent essays: Radley, "Margaret Cavendish's Cabbala: The Empress and the Spirits in *The Blazing World*" (2014); Mendelson, "Margaret Cavendish and the Jews" (2014); and Siegfried, "'Soulified': Cavendish, Rubens, and the Cabbalistic Tree of Life" (2014).

⁵¹² *The Blazing World*, 92.

⁵¹³ More, *Conjectura Cabbalistica* (London, 1663), 183-6.

More's cabala in a dialogue with immaterial spirits that undermine their own existence. In doing so, she both echoed the conversation in *A True & Faithful Relation* and situated her critique in relation to the tradition of the Platonic dialogue. While an earlier generation of scholars was preoccupied with discussions of *prisca sapientia*, recent studies have shown that there was a growing disenchantment with narratives of Mosaic primacy in England over the course of the seventeenth century.⁵¹⁴ Cavendish's satirical jibes corroborate the view that such sentiments had spread well beyond the rigorous historical research of scholars such as Joseph Scaliger and Meric's father, Isaac Casaubon, by the mid-1660s. Bringing theological criticisms into the realm of satirical fiction enabled Cavendish to shame and advocates of unorthodox theological views, and partake in the morally rectifying process of deterring the further exposition of such opinions, without directly infringing upon the domain of established divines.

Moving from these more general criticisms, however, Cavendish does address a number of specific doctrines in More's cabala that have wider theological reverberations. In her discussion with the spirits, the Empress relays how "Cabbalists and Divine Philosophers said, mens rational Souls were Immaterial, and stood as much in need of corporeal Vehicles, as Spirits did". She is told in response that "your Cabbalists are mistaken, for they take the purest and subtillest parts of Matter for Immaterial Spirits".⁵¹⁵ As we saw in 2.1, Cavendish held that the rational soul was a material and divisible principle. By contrast, as an early proponent of Cartesian philosophy in England, More confounded the rational and incorporeal souls.⁵¹⁶ That said, whereas Descartes'

⁵¹⁴ See Hardy, "Impartiality and the Early Modern *Ars Critica*: The Case of John Selden's *Historie of Tithes* (1618)" (2014).

⁵¹⁵ *The Blazing World*, 78-9.

⁵¹⁶ Some useful sources in the large body of literature on More and Descartes are Gabbey, "Philosophia

immaterial soul was a metaphysical expedient to prove God's existence and establish the possibility of obtaining certain knowledge, More dwelt on the nature of the soul at length. Conjuring the "the general Opinion of the *Platonists*", one of More's many "axioms" in his *Immortality of the Soul* is that there is a "Triple *Vitall Congruity* in the Soule, namely *Aethereall, Aeriall, and Terrestriall*".⁵¹⁷ Proliferating the immaterial gradations on the *scala naturae*, More avers that each soul mounts the rungs of corporality until it hypostasises in permanent communion with God, there being "very few that arrive to that high happiness, as to acquire a *Coelestial Vehicle* immediatly upon their quitting the *terrestrial one*".⁵¹⁸ In *The Blazing World*, Cavendish satirises More's multiplicity of material vehicles by having the Empress ask the immaterial spirits "whether their Vehicles were made of Air?" only to be informed that "some of our Vehicles are of thin Air".⁵¹⁹ Taking a more serious tone in *Philosophical Letters*, she states that rationality can hardly extend to the immaterial realm, and that scripture only reveals "that immediately after her departure out of this natural life" the incorporeal soul goes "to Heaven or Hell, either to enjoy Reward, or to suffer Punishment".⁵²⁰ She thus retained the Reformed position that souls are gifts from God that are infused into human beings some time between conception and birth, and instantly depart to the afterlife following death.

While Cavendish regarded More's vehicles as little more than thin air, they underpin one of his primary theological concerns: the pre-existence of immaterial souls.

Cartesiana Triumphata: Henry More (1646-1671)" (1982); Pacchi, *Cartesio in Inghilterra: Da More a Boyle* (1973); Cottingham, "Force, Motion and Causality: More's Critique of Descartes" (1997); and Webster, "Henry More and Descartes: Some New Sources" (1969).

⁵¹⁷ *Immortality of the Soul*, 332. On the Platonic background to the idea of material vehicles, see Dodds, "The Astral Body in Neoplatonism" (1963).

⁵¹⁸ *Immortality of the Soul*, 261. On this idea, see Lewalski, "Typological Symbolism and the 'Progress of the Soul' in Seventeenth-Century Literature" (1977).

⁵¹⁹ *The Blazing World*, 78.

⁵²⁰ *Philosophical Letters* 217-18.

According to More's understanding of history, Plato adapted the Mosaic-inspired doctrine of Pythagorean metempsychosis in dialogues such as *Meno* and *Phaedrus*, and these ideas were subsequently taken up by perhaps the most controversial of Church Fathers, Origen of Alexandria, in his work *On First Principles*.⁵²¹ It is this genealogy that permitted More's elevation of pre-existence in his cabalistic reading of Genesis. Even before developing his idiosyncratic approach to Mosaic primacy, however, More defended pre-existence in his early poetry, most notably in his 104-stanza poem on "The Praeexistency of the Soul" in *Philosophical Poems*.⁵²² Such chronological discrepancies may have further verified Cavendish's suspicion that More's understanding of history had little bearing on his cabalistic reading of scripture, but that his early Platonic orientation rather buttressed his approach to history. In any case, by the time he published *Immortality of the Soul*, More went so far as to claim that "the *Praeexistence* of Souls is a necessary result of the Wisdome and Goodness of God".⁵²³ According to his "philosophical" exegesis on the "Aenigmatical narration" of Genesis, Adam and Eve were incorporeal spirits that were fitted to ethereal vehicles. It was only after the Fall that "the *Aereal* or *Ethereal Adam*" was "conveyed into an earthly body, having his most conspicuous residence in the head or brain: And thus Adam became the Soul of a *Terrestrial living Creature*".⁵²⁴ More rendered scripture in this way because he believed

⁵²¹ See Plato, *Meno*, 81a-d and *Phaedrus*, 248d-249d. Also see Long, *A Study of the Doctrine of Metempsychosis in Greece from Pythagoras to Plato* (1948), especially 65–86; Tripolitis, *The Doctrine of the Soul in the Thought of Origen and Plotinus* (1978); and Bianchi, "Origen's Treatment of the Soul and Debate over Metempsychosis" (1987).

⁵²² More, *Philosophical Poems* (London, 1647), 225-81.

⁵²³ *Immortality of the Soul*, 243. On More and pre-existence, see van den Berg, "Menasseh ben Israel, Henry More and Johannes Hoornbeeck on the Pre-existence of the Soul" (1989); Hutton, "Henry More and Anne Conway on Pre-Existence and Universal Salvation" (1996); Crocker, *Henry More, 1614-1687: A Biography of the Cambridge Platonist* (2003), 111-25; and Walker, *The Decline of Hell: Seventeenth-Century Discussions of Eternal Torment* (1964), 122-55.

⁵²⁴ *Conjectura Cabbalistica*, 37. See Williams, *Ideas of the Fall and of Original Sin: A Historical and*

that if God initially infused immaterial souls into terrestrial bodies on the sixth day of the creation, then He would be guilty of having formed humans with their current proclivity for evil. But God could only be truly just and good, thought More, if he created humankind to exist on a higher plane, before Adam and Eve freely chose to descend the scale of corporeality. Seizing upon this supposition, Cavendish expresses her misgivings towards More's ethereal Adam by writing that "those Cabbalists are much out of their story, who believe the Paradise to be a world of Life onely, without Matter".⁵²⁵

Owing to its poetic qualities, Cavendish thought that it was most appropriate to grapple with More's cabala in her fictitious *Blazing World*. Yet she does write in *Philosophical Letters* that "You will have my opinion of the Book that treats of *the Pre-existence of Souls*, and the *Key that unlocks the Divine Providence*" in the following letter.⁵²⁶ Rather than referring to More's work, this passage invokes the full title of an anonymous publication of 1662: *Lux Orientalis, or an Enquiry Into the Opinions of the Eastern Sages, Concerning the Praeexistence of Souls. Being a Key to Unlock the Grand Mysteries of Providence*. Cavendish may have been unaware of who penned *Lux Orientalis* when she composed *Philosophical Letters*, but her correspondence with Glanvill between 1666 and 1667 serves as a crucial source of evidence for the latter's authorship.⁵²⁷ In an epistle from August 1666, Glanvill notifies Cavendish that there "is a

Critical Study (1927), 315-90 and 423-43.

⁵²⁵ *The Blazing World*, 73.

⁵²⁶ *Philosophical Letters*, 230.

⁵²⁷ The best study of Glanvill and pre-existence is Lewis, "Of 'Origenian Platonisme': Joseph Glanvill on the Pre-existence of Souls" (2006). For Glanvill as the author of *Lux orientalis*, see *Calendar of the Correspondence of Richard Baxter*, Vol. 2, ed. by Keeble and Nuttall (1991), 54-55; *The Correspondence of Robert Boyle*, Vol. 2, ed. by Hunter, Clericuzio, and Principe (2004), 54-5; and Thomas Barlow's copy of *Lux Orientalis*, Bod., Oxford, 8°C 678 Linc., in which Barlow inscribed on his title page that the work was "By Ios. Glanwile".

Discourse of mine extant upon a Subject not very ordinary”.⁵²⁸ In a subsequent letter, he clarifies that he was speaking of *Lux Orientalis*. Sending Cavendish his *Philosophical Considerations Touching the Being of Witches* (which is dated 1667, but must have been finished by December 1666), Glanvill writes that regarding “that of Preexistence I have many things to say more about it, which I think not fit publickly to expose; your Grace may command my inmost sentiments of those matters”.⁵²⁹ Despite Glanvill’s recurring promises to secure a copy of *Lux Orientalis* for Cavendish, she does not seem to have received the work. In a later letter in which Glanvill responds to Cavendish’s objections to pre-existence at length, he states that “your *Grace* will see easily” the strength of his points “when I shall have procured that Book of mine, I have mentioned, and promised your *Grace*, but cannot yet light on”.⁵³⁰ Since it is evident in this epistle that Cavendish was already conversant with the chief arguments for pre-existence, Glanvill may have supplied her with a comprehensive overview of his ideas on the subject (as he had promised in an earlier letter). Because it contained material “not fit publickly to expose”, Cavendish may have destroyed this epistle or William Cavendish could have decided not to include it in the collection when he compiled *Letters and Poems*. Alternatively, she may have pieced together Glanvill’s ideas on pre-existence through alternative means, especially More’s publications. Cavendish would have been right in doing so, for both in a letter to her and in his preface to *Lux orientalis* Glanvill identifies “the most learned Dr. *H. Moore*” as the chief inspiration behind his discussion of pre-existence.⁵³¹

⁵²⁸ *Letters and Poems*.

⁵²⁹ *Letters and Poems*, 85.

⁵³⁰ *Letters and Poems*, 125.

⁵³¹ *Letters and Poems*, 124-6 and Glanvill, *Lux orientalis* (London, 1662), B6v.

Cavendish never does provide her promised appraisal of *Lux orientalis* in *Philosophical Letters*, and we lack her side of the correspondence with Glanvill. But her fictional correspondence can nonetheless be used to reconstruct how she would have tackled topics such as the incorporeal soul, God, and the creation in her actual exchange with Glanvill. In a letter to Cavendish from October 1667, Glanvill rehearses More's view that pre-existence "best Answers for the Divine Justice and Goodness", since it avoids locating the origin of sin in the divine will.⁵³² Restating Cavendish's objections before clarifying his position, Glanvill proceeds to write:

to your *Grace's Quaery*, Whether were *Souls* Created or Uncreated? I Answer, no doubt Created: But then I do not see how that follows, which your *Grace* is pleased to infer, *Viz.* That Sin was then Created, For our *Souls* in their State were Spotless and Innocent, as the Angels of God. That Mankind was so first, and fell by a voluntary Transgression, is the common Doctrine.⁵³³

In responding to his previous epistle, Cavendish evidently inquired into whether Glanvill believed God created immaterial souls. Neither More nor Glanvill were transparent on this point, but they both ultimately calibrated the view of "the *Platonists*, who will have the Soul to be the Bodies Maker", to a Christian discourse by arguing that "all souls were created at once in the first day" of the six-day creation, and only tailored to ethereal vehicles subsequently.⁵³⁴ If this is the case, Cavendish countered, God still created immaterial souls, which are responsible for volition, with the capacity to commit sin. More and Glanvill merely place temporal intervals and material vehicles between God's creation of souls, the prelapsarian state of perfection, and the current Fallen condition of humankind. Further, insofar as Adam and Eve were both more incorporeal than humans

⁵³² *Letters and Poems*, 125.

⁵³³ *Letters and Poems*, 126. On Glanvill's theology more generally, see Cope, *Joseph Glanvill: Anglican Apologist* (1956) and Pauschert, *Joseph Glanvill und die Neue Wissenschaft des 17. Jahrhunderts* (1994).

⁵³⁴ See *Letters and Poems*, 124 and *Conjectura Cabbalistica*, 161.

are currently and were still capable of committing the original sin, imperfection must taint not only terrestrial bodies but also ethereal vehicles.

Even as he advanced a highly idiosyncratic reading of Genesis, Glanvill reminded Cavendish of the common doctrine that the Fall impacted all of humankind. She recognises in *Philosophical Letters*, however, that of late “many are of the opinion that there have been men before *Adam*”.⁵³⁵ Preadamism was popularised by Issac La Peyrère’s 1655 *Prae-Adamitae* and its 1656 translation as *Men Before Adam*, but Hobbes was probably Cavendish’s chief point of reference for this idea.⁵³⁶ Endeavouring to establish an orthodox theology, she did not defend Preadamism. Yet, unlike pre-existence, Cavendish did not conceive of such a position as incommensurate with scripture. Glanvill himself points out in one of his letters that the Bible says “nothing of those large unknown Tracts of *America*, gives no intimations of the Existence of that numerous People, much less any instructions about their Conversion”.⁵³⁷ Throughout *Philosophical Letters*, Cavendish approaches scripture literally, but then draws attention to the scope of its narration. In doing this, she sought to demarcate where scripture ends and natural philosophy begins, rather than suiting scripture to her philosophical needs. Cavendish’s desire to refrain from projecting her ideas onto scripture left her more sympathetic towards Preadamism than pre-existence.

⁵³⁵ *Philosophical Letters*, 15.

⁵³⁶ See Popkin, *Isaac La Peyrère (1596-1676): His Life, Work, and Influence* (1987); Poole, “Seventeenth-Century Preadamism, and an Anonymous English Preadamist” (2004); Malcolm, *Aspects of Hobbes*, 383-431; and Grafton, *Defenders of the Text: The Traditions of Scholarship in an Age of Science, 1450-1800* (1991), 204-13.

⁵³⁷ *Letters and Poems*, 138.

Following from her first retort, Cavendish's second objection to Glanvill's argument for pre-existence is that he overstates the proximity between God and man. As Glanvill paraphrases:

the other part also of your *Graces* Division: *Viz.* That if those *Souls* were Eternal, they are Gods; is I humbly conceive a mistake likewise, since though the World, had been Created from Eternity (which even the Schools confess possible) it had nevertheless been a Creature, by reason of its dependence upon another, for its being.⁵³⁸

In this passage, Glanvill fails to grasp Cavendish's distinction between God and Nature. In *Philosophical Letters*, she retains her belief from *Poems, and Fancies* that "this World is onely a part of Nature, or Natural Matter, and there may be more and Infinite worlds besides".⁵³⁹ She further maintains that there "have been worlds before", and points out that "many amongst Divines do believe, that after the destruction of this World God will Create a new World again".⁵⁴⁰ Squaring the notion of an infinite Nature and multiple worlds with scripture, she states that "the holy Scripture informs us onely of the Creation of this Visible World, but not of Nature and natural Matter; for I firmly believe according to the Word of God, that this World has been Created, as is described by *Moses*, but what is that to natural Matter?"⁵⁴¹

Although scripture and the Church creeds are silent on the scope of the creation, Cavendish notes that they do affirm God to be "an Eternal, Infinite, Immaterial, [and] Individable Being".⁵⁴² Embracing this definition, she held that both God and Nature are infinite, but she denied that the natural world is indivisible or that any of its parts are immaterial. Without these prerequisites, there is already a definitional disparity between

⁵³⁸ *Letters and Poems*, 126.

⁵³⁹ *Philosophical Letters*, 460.

⁵⁴⁰ *Philosophical Letters*, 15.

⁵⁴¹ *Philosophical Letters*, 15.

⁵⁴² *Philosophical Letters*, 140.

God and Nature, never mind between God and the world. Nonetheless, for the sake of argumentation, Cavendish ignored these qualms and conceded to Glanvill's analogy between the world and souls, which was grounded in the Pythagorean-Platonic trope of the world-soul. Even given this leniency, however, Cavendish did not consider this world (which is a part of Nature) to be eternal, just as she denied the eternity of incorporeal spirits (which are a subset of the supernatural realm). Rather than a being in itself, she conceived of an infinite and eternal Nature as the precondition for the existence of material beings. For his part, Glanvill intimated that incorporeal souls could exist as infinite, eternal, immaterial, and indivisible beings. Based on the definition of God that Cavendish derived from the Church creeds, this is to make them gods. Whatever the force of her objections to pre-existence, however, she could not hope to sway Glanvill. In consecutive publications, Glanvill juxtaposed his moderate scepticism towards all propositions aside from the fundamental tenets of the Christian faith against the vain dogmatism of the Scholastics.⁵⁴³ But Glanvill admits to Cavendish that he is "a little *Dogmatical*" regarding the pre-existence of souls.⁵⁴⁴ For Cavendish, the proximity between Glanvill's incorporeal souls and God could only serve to destabilise the Church creeds, clearing the way for dogmatic adherence to non-fundamental articles of faith.

While Cavendish contested Glanvill's muddling of the world and Nature, she would have appreciated his appeal to the Scholastic idea of the "Eternal Generation of the Son" to validate the view that to "have been produced, and yet from Eternity, is no absurdity".⁵⁴⁵ Reaching for points of continuity between their thought, Glanvill may have even reframed a point he found in Cavendish's books, for he admitted that ever since

⁵⁴³ See Talmor, *Glanvill: The Uses and Abuses of Scepticism* (1981).

⁵⁴⁴ *Letters and Poems*, 125.

⁵⁴⁵ *Letters and Poems*, 126.

receiving her “ingenious Works, I have, as my occasions would permit, cast my Eyes again into them”.⁵⁴⁶ This question aside, Cavendish most fully expresses her views on coeternity when she writes

that God is not tied to Natural Rules, but that he can do beyond our Understanding, and therefore he is neither bound up to time, as to be before, for if we will do this, we must not allow, that the Eternal Son of God is Coeternal with the Father, because nature requires a Father to exist before the Son, but in God is no time, but all Eternity.⁵⁴⁷

As Cavendish points out, the orthodox position is that God is the Father of Christ even though the Godhead is coeternal. By appealing to the Trinity, she can similarly argue that God had a role in the creation of a subservient but eternal Nature. Taking this a step further, she reasons that “if *Nature* has not been made by God from all Eternity, then the Title of God, as being a Creator, which is a Title and action, upon which our Faith is grounded, (for it is the first Article in our Creed) has been accessory to God, as I said, not full Six thousand years ago”.⁵⁴⁸ But Cavendish argued that any adjective attributed to God must be an essential property that always describes Him, since “Gods Attributes, though they be all several Infinites, yet they make but one Infinite”.⁵⁴⁹ Adding nuance to her definition, she maintained that “God is a Spirit, and Immovable”, for any change in God would subtract from his perfection.⁵⁵⁰ Whereas More and Glanvill underscored God’s omnipresence and his relentless participation in the natural world, Cavendish’s belief that God is a simple and utterly transcendent being that created the world outside of time accords with the traditional Scholastic notion of God.⁵⁵¹

⁵⁴⁶ *Letters and Poems*, 98.

⁵⁴⁷ *Philosophical Letters*, 322 and 14.

⁵⁴⁸ *Philosophical Letters*, 17.

⁵⁴⁹ *Philosophical Letters*, 9.

⁵⁵⁰ *Philosophical Letters*, 196.

⁵⁵¹ See Hampton, *Anti-Arminians*, 221-65.

Despite the fact that both Cavendish and Glanvill were Trinitarians, Glanvill notably refers to the “Procession of the Holy-Ghost” rather than the stability of the Father in his discussion of coeternity. As implied in Glanvill’s letter, Cavendish appeals to the Trinity to show that creation can occur outside of time, yet she repeats throughout *Philosophical Letters* that this should be understood as no more than an analogy since Nature is subordinate to God. At the same time, God’s attributes are eternal and essential, meaning that all parts of the godhead are equally necessary to His being. Cavendish points out that this is in agreement with the declaration in “the *Athanasian Creed*, that the Father is Incomprehensible, the Sonne Incomprehensible, and the Holy Ghost Incomprehensible; and that there are not three, but one Incomprehensible God”.⁵⁵² Conversely, Glanvill’s appeal to the Holy Spirit as eternally *proceeding* from the Son suggests the Christian Platonic heresy of subordinationism.⁵⁵³ Out of joint with Cavendish’s acknowledgement of divine simplicity, subordinationism is the notion that the Holy Spirit is a hypostasis of the Son rather than an equal part of the godhead.

Based on Cavendish’s definitions of God and Nature, we can now situate her ideas within seventeenth-century debates regarding the relationship between theology and natural philosophy. Aristotle’s *Metaphysics* served as the battleground for such disputes. On the one hand, Aristotle defined metaphysics as the study of “being *qua* being”, or the science of universal principles within the natural world. On the other, he described it as the science of eternal causes and immaterial beings, or the study of entities that transcend

⁵⁵² *Philosophical Letters*, 141.

⁵⁵³ On debates over the Trinity during the seventeenth century, see Babcock, “A Changing of the Christian God: The Doctrine of the Trinity in the Seventeenth Century” (1991); Mulsow, “The Trinity as Heresy: Socinian Counter-Histories of Simon Magus, Orpheus, and Cerinthus” (2002); Mortimer, *Reason and Religion in the English Revolution: The Challenge of Socinianism* (2010), 147-204; and Lim, *Mystery Unveiled: The Crisis of the Trinity in Early Modern England* (2012).

Nature.⁵⁵⁴ Although there was no unequivocally “orthodox” reading of these passages, figures such as Hobbes manipulated the delineation of metaphysics as the study of being *qua* being towards unconventional ends. As Glanvill reproves in a letter to Cavendish, “Mr. *Hobbs* denys all Immateriality to Created Beings”. By doing so, he reduced metaphysics to the study of material bodies as first causes.⁵⁵⁵ While the degree to which Hobbes was a heterodox thinker remains open to debate, it is almost certainly the case that by defining metaphysics as first philosophy Hobbes sought to supplant theology as a genuine object of study and to replace it with his version of physics.⁵⁵⁶ Cavendish mostly abstains from dwelling on Hobbes’s “theological” views; however, she does respond to a passage in *De corpore* in which he claims that all infinities are composed of finite parts with the friendly reminder that “there is but One God, who is Infinite, and hath none other to be compared withal”.⁵⁵⁷

As Cavendish discerned, Hobbes’s definition of metaphysics stood in stark contrast to More’s emphasis on immaterial substances and agents as the causes of natural effects. Responding to More, Cavendish does not believe that any “Angel, nor Devil, except God Impower him, would be able to move corporeal Matter”.⁵⁵⁸ Her only exceptions are Jesus, the disciples, and, another topic in her correspondence with

⁵⁵⁴ Aristotle, *Metaphysics*, VI, 1026a and 1064a. For the background to this definition of metaphysics in a pedagogical setting, see Lohr, “The Sixteenth-Century Transformation of the Aristotelian Division of the Speculative Sciences” (1991) and “Metaphysics and the New Science” (1990). Also see Jardine, “Keeping Order in the School of Padua: Jacopo Zabarella and Francesco Piccolomini on the Offices of Philosophy” (1997) and Mikkeli, “The Foundation of an Autonomous Natural Philosophy: Zabarella on the Classification of Arts and Sciences” (1997). For the contribution by amateur natural philosophers, see Levitin, *Ancient Wisdom*, 242-51.

⁵⁵⁵ *Letters and Poems*, 126. See Leijenhorst, *The Mechanisation of Aristotelianism*, especially 17-27 and Zarka, “First Philosophy and the Foundations of Knowledge” (1996).

⁵⁵⁶ On debates surrounding Hobbes and heterodoxy, see Rose, “Hobbes Among the Heretics?” (2009).

⁵⁵⁷ *Philosophical Letters*, 51.

⁵⁵⁸ *Philosophical Letters*, 196.

Glanvill, figures such as “the witch of *Endor*, which the Scripture makes mention of”.⁵⁵⁹ Cavendish accordingly adhered to a hermeneutics that is congenial to the orthodox position that miraculous or supernatural occurrences ceased after the establishment of the early Church.⁵⁶⁰ Continuing her critique of More, she argues that “Nature is so full of variety, that she can and doth present sometimes such figures to our exterior senses, as are not familiar to us, so as we need not to take our refuge to Immaterial Spirits”.⁵⁶¹ Cavendish thus fashioned recourse to incorporeal causes as intellectual retreats that truncate the further search for natural explanations.

Instead of siding with either Hobbes or More, Cavendish followed the likes of Casaubon by working from the theological definition of metaphysics, which was more in keeping with the prevailing Scholastic interpretation. While she regarded sense and reason as the grounds of natural philosophy, Cavendish believed that knowledge of God and the immaterial relied on the interplay between faith and reason. Taking moments such as when she claims that where “Reason ends, Faith begins” out of context, scholars have sometimes shaped Cavendish as a fideist, often imputing Hobbes’s rejection of theology as a legitimate science to her in the process.⁵⁶² Yet, simply because she denied that humans could fully grasp God’s essence, it does not follow that Cavendish considered religious belief to conflict with reason. In reality, her notion that rational matter gives rise to all facets of human cognition led her to argue that “our very thoughts and conceptions of Immaterial are Material, as made of self-moving Matter”.⁵⁶³

⁵⁵⁹ *Philosophical Letters*, 227.

⁵⁶⁰ See Dear, “Miracles, Experiments, and the Ordinary Course of Nature” (1990); Harrison, “Miracles, Early Modern Science, and Rational Religion” (2006); and Walker, “The Cessation of Miracles” (1988).

⁵⁶¹ *Philosophical Letters*, 228.

⁵⁶² See Sarasohn, “Fideism, Negative Theology, and Christianity in the Thought of Margaret Cavendish” (2014).

⁵⁶³ *Philosophical Letters*, 187.

Simultaneously, she held that “natural reason, without Faith” cannot “advance the divine soul to Heaven, or beget a pious zeal, without divine and supernatural Grace”.⁵⁶⁴

Fundamental articles of faith—such as the doctrine of the Trinity—must be embraced on the authority of scripture and the Church. But deductions should subsequently be made to work out what follows from accepting these articles.⁵⁶⁵ Closely connected to (though not equivalent with) the question of where scripture ends and natural philosophy begins, the issue for thinkers such as Cavendish was not whether religious topics could be grappled with rationally, but rather how far reason could extend in matters of religion.⁵⁶⁶

Cavendish’s emphasis on the balance between faith and reason led her to focus on the necessity of ecclesiastical order, which again contrasts with the positions of Hobbes and More. As a corollary to his belief that there was no science that has its object as the immaterial, Hobbes deemed the clergy to be largely redundant and frequently corrupt. By contrast, More’s confounding of metaphysics and physics led him to endorse the figure of the philosopher-divine or pious philosopher.⁵⁶⁷ For her part, Cavendish expresses amazement that “every body is so forward to encroach upon the holy Profession of Divines, which yet is a greater presumption, then if they did it upon any other”, since the topic of theology is a “most hidden and mystical knowledg, as treating of the Highest Subject, which is the most Glorious, and Incomprehensible God, and the salvation of our

⁵⁶⁴ *Philosophical Letters*, 222-3.

⁵⁶⁵ This method of proceeding allows Cavendish to overcome an apparent tension between faith and reason that Karen Detlefsen has identified in “Margaret Cavendish on the Relationship between God and World” (2009).

⁵⁶⁶ See Spurr, “‘Rational Religion’ in Restoration England” (1988). More generally, see Allen, *The Legend of Noah: Renaissance Rationalism in Art, Science, and Letters* (1963).

⁵⁶⁷ On the development of the philosopher-divine, see Fischer, “The Scientist as Priest: A Note on Robert Boyle’s Natural Theology” (1953) and Stewart, *The Rise of Public Science: Rhetoric, Technology, and Natural Philosophy* (1992), 31-60.

Souls”.⁵⁶⁸ Even more than in her earlier medical reflections, Cavendish continually reaffirms her identity as a “natural philosopher” in *Philosophical Letters*, especially after she touches on theological matters. At one moment, upon succeeding from a discussion of the natural to the supernatural soul, Cavendish explicitly states that “I shall desire you to excuse me, for that belongs to Divines, and not to Natural Philosophers; neither am I so presumptuous as to intrench upon their sacred order”.⁵⁶⁹ While she was disposed to avoid imposing on divines in her published works, she was far more candid in her correspondences with Glanvill, for such private exchanges did not set a precedence for other laypeople. Reiterating throughout *Philosophical Letters* that she will reserve this theme for “Divines to inform us of”, Cavendish certainly considered theology to be a legitimate university discipline. Meanwhile, she hoped to deter doctors of divinity from wasting their time with natural philosophy—or at least to keep their philosophical and theological publications discrete—leaving it as a subject in which amateurs could retain authority.⁵⁷⁰

The distinction between physics and metaphysics provides the groundwork for understanding Cavendish’s writing against the backdrop of broader religious trends in seventeenth-century England. As we have seen, Cavendish repeatedly appeals to the “first Article in our Creed”, or the Nicene Creed, in *Philosophical Letters*. Initially acting as a declaration of correct belief or orthodoxy for the early Church, this creed was notably a centrepiece of the Anglican Communion during the 1660s. By appealing to it, Cavendish was thus aligning herself with the stability of the post-Nicene Church. In this way, she indicated the orthodoxy of her Reformed Anglican theology—that was

⁵⁶⁸ *Philosophical Letters*, 316.

⁵⁶⁹ *Philosophical Letters*, 492.

⁵⁷⁰ On these issues, see Feingold, “Science as a Calling? The Early Modern Dilemma”.

institutionally codified following the Reformation—against Glanvill and More’s engagement with controversial ante-Nicene Platonic Fathers, such as Origen.⁵⁷¹ In the early 1660s, the Church of England and the lion share of its divines were Reformed Anglicans; however, during the latter half of the century, thinkers of an Arminian bent became increasingly prevalent in the Church.⁵⁷² While there were various ways of interpreting the relationship between physics and metaphysics, many affinities were forged between Reformed and Scholastic ideas and methods. In particular, their doctrines of God were almost identical, both prioritising His infinity and perfect simplicity.⁵⁷³ Along with working from a Scholastic orientation, Cavendish was accordingly situating herself within the tradition of Reformed thought. By contrast, More was an outspoken anti-Calvinist who desired to shift the established order. He fashioned his theological stress on God’s omnibenevolence (with the Platonic tradition aligning God and the Good) to mark himself as an Arminian.⁵⁷⁴ As this suggests, whereas Reformed thinkers amplified the distance between God’s perfection and the sinful nature of humankind, the Arminian tradition accentuated God’s love for and protection over the individual believer.

⁵⁷¹ On the Reformed/Arminian distinction increasingly being shaped as a debate over the significance of pre-Nicene fathers, see Quantin, *The Church of England and Christian Antiquity: The Construction of a Confessional Identity in the 17th Century* (2009); Levitin, *Ancient Wisdom*, especially 447-67; and Mandelbrote, “Origen against Jerome in Early Modern Europe” (2010).

⁵⁷² On the turn against Reformed theology in England, see Tyacke, *Anti-Calvinists: The Rise of English Arminianism c. 1590-1640* (1990) and McAdoo, *The Spirit of Anglicanism: A Survey of Anglican Theological Method in the Seventeenth Century* (1965). Some useful corrective that helps to better situate Cavendish can be found in Hampton, *Anti-Arminians* and Muller, *After Calvin*.

⁵⁷³ On Scholasticism and Reformed theology, see Muller, *God, Creation, and Providence in the Thought of Jacob Arminius: Sources and Directions of Scholastic Protestantism in the Era of Early Orthodoxy* (1991); the essays in *Reformation and Scholasticism: An Ecumenical Enterprise*, ed. by van Asselt and Dekker (2001); and Donnelly, *Calvinism and Scholasticism in Vermigli’s Doctrine of Man and Grace* (1976).

⁵⁷⁴ See Colie, *Light and Enlightenment: A Study of the Cambridge Platonists and the Dutch Arminians* (1957) and Simonutti, “Reason and Toleration: Henry More and Philip van Limborch” (1989).

Against More's use of pre-existence to justify God's goodness, Cavendish admits that she is fain to "know the reason, why your *Author* is so unwilling to make God the Author of Death, and Sickness, as well as of Damnation? Doth it imply any Impiety or Irreligiousness? Doth not God punish, as well as reward?"⁵⁷⁵ Focusing on the insuperable expanse between God and humankind, Cavendish held that human morality provided no simple conclusions about the nature of God's justice. Of course, this was the foundation for the Reformed emphasis on salvation by faith alone rather than works. Because the immaterial soul was ordained from the beginning of time and not contingent upon the actions of individual human beings, she believed that it is "a supernatural Gift from God onely to Man".⁵⁷⁶ For Cavendish, this gift is a result of God's grace and should be gratefully accepted as a sign of His mercy rather than endlessly interrogated. Given that a chief point of contention between Cavendish and More is the degree to which individuals can comprehend and model their behaviour upon God's beneficence, it is perhaps more than ironic that More (somewhat duplicitously) wrote to Cavendish upon receiving the gift copies of her works that he "was swallowed up into admiration of your Ladyship's singular and unparalleld goodness".⁵⁷⁷ More may have been at a loss for words to describe the nature of her gift, but a focal point in Cavendish's critique of More is that he had far too much to say about God's gift to humankind.

3.2 The Spirit of Nature: Henry More and Gideon Harvey

Scholars have often (if somewhere reductively) brought the debate between Reformed and Arminian thought down to the distinction between predestination and free will.

⁵⁷⁵ *Philosophical Letters*, 348-9.

⁵⁷⁶ *Philosophical Letters*, 226.

⁵⁷⁷ *Letters and Poems*, 90.

Concentrating on her natural philosophy, it has usually been supposed that Cavendish considered the natural world, down to its smallest constituent parts, to be absolutely free.⁵⁷⁸ But, by looking at her work from a theological perspective, a very different picture emerges. In *Philosophical Letters*, Cavendish ironises the way in which More's Arminian orientation incited him to catechise about the divine will by stringing together rhetorical questions: "Whence came his Fall? From his Pride and Ambition to be equal with God. From whence came this Pride? From his Free-will. From whence came his Free-will? From God".⁵⁷⁹ Far from affirming the irreducible autonomy of humankind, here Cavendish ventriloquises More's argument that immaterial souls must possess free will in order to circumvent the notion that God had any role in the Fall.⁵⁸⁰ Following from her critique of pre-existence, she takes More's probing a step further to conclude that God would have still granted humans the freedom to sin.

Rather than drilling this point home in her critique of More, Cavendish most plainly expresses her ideas on predestination and free will by conveying a dialogue between "Sir *P.H.* and Sir *R.L.*". The provided initials are misleading, but this letter almost certainly evokes a famous debate that occurred at the Cavendishes' Parisian salon in 1645 between Hobbes and John Bramhall.⁵⁸¹ Summarising the perspective of Bramhall, Sir *P.H.* condemns predestination as blasphemous, whereas Sir *R.L.*, or Hobbes, argues that it is most compatible with the idea of an infinite and eternal God.

⁵⁷⁸ For the view that Cavendish considered the natural world to be free, see Detlefsen, "Reason and Freedom: Margaret Cavendish on the Order and Disorder of Nature" (2007); Boyle, "Margaret Cavendish on Gender, Nature, and Freedom" (2013); and Rogers, *The Matter of Revolution*, 177-204. For a non-theological perspective on why Cavendish did not consider Nature to be absolutely free, see Cunning, *Cavendish*, chapter 6.

⁵⁷⁹ *Philosophical Letters*, 349.

⁵⁸⁰ See *The Immortality of the Soul*, 153.

⁵⁸¹ See Hobbes, *Of Liberties and Necessities, A Treatise* (London, 1654); Chappell, "Introduction", *Hobbes and Bramhall: On Liberty and Necessity* (1999), ix-xxiii; and Damrosch, "Hobbes as Reformation Theologian: Implications of the Free-Will Controversy" (1979).

After representing their views, Cavendish typically takes the middle-ground by declaring that she is “neither for Predestination, nor for an absolute Free-will, neither in Angels, Devils, nor Man; for an absolute Free-will is not competent to any Creature: and though Nature be Infinite, and the Eternal Servant to the Eternal and Infinite God, and can produce Infinite Creatures, yet her Power and Will is not absolute”.⁵⁸² While Nature as a totality is less restrained than any of its parts, even it follows a plan that God has put in place for all of eternity. Cavendish’s theological discussion in *Philosophical Letters* makes it clear that (contra More) she disallowed the possibility that either supernatural or natural creatures are endowed with an “absolute Free-will”.

Cavendish’s differentiation between the unrestrained movement of rational and sensitive matter and God’s absolute autonomy proceeds from an Aristotelian-Scholastic distinction between the efficient cause (the agent that makes the object) and the material cause (the material out of which the object was made). Periodically, she also terms the “efficient” and “material” as the “occasional” and “principal” causes, such as when she writes that “some things may be Occasional causes of other things, but not the Prime or Principal causes; and this distinction is very well to be considered, for there are no frequenter mistakes then to confound these two different causes”.⁵⁸³ The language of “occasional causes” that Cavendish implements here was derived from the Scholastic tradition, but Cartesians most commonly deployed it during the mid-seventeenth century.⁵⁸⁴ Cavendish reveals that she was conversant with this latter discourse when she writes that “although the Artist or Watch-maker be the occasional cause that the Watch moves in such or such an artificial figure, as the figure of a Watch, yet it is the Watches

⁵⁸² *Philosophical Letters*, 505.

⁵⁸³ *Philosophical Letters*, 79.

⁵⁸⁴ See Nadler, *Occasionalism: Causation Among the Cartesians* (2010).

own motion by which it moves; for when you carry the Watch about you, certainly the Watch-makers hand is not then with it as to move it”.⁵⁸⁵ Here Cavendish adopted a mechanical analogy to frame her discourse as a response to the views of Cartesians such as Louis de La Forge and Géraud de Cordemoy—both of whom published treatises in 1664—that God is the immediate and constant trigger of all natural phenomena. For her, it is as absurd to claim that God incessantly intervenes in the natural world as it is to insist that a watchmaker continually causes a timepiece to tick.

Cavendish appeals to scripture to theologically validate the distinction between occasional and principle causes when she writes that “God created this World in six days, and rested the seventh day”, but his relentless intervention in the natural world “would be a perpetual Creation”. Far removed from the inefficient architect of the Cartesians, she maintained that God designed the natural world so that its vital matter would carry out His pre-ordained plans.⁵⁸⁶ Transferring from the language of the occasional and principle cause back to the efficient and material, Cavendish similarly writes in response to van Helmont that she cannot “understand his meaning, when he says, That the *Seeds of things, and the Spirits, as the Dispensers thereof, are divided from the Material Cause*: For I do see no difference betwixt the Seed, and the material Cause”.⁵⁸⁷ As we saw in the last chapter, van Helmont considered the divine *archeus* to be an efficient cause—infused into the natural world by God—that put otherwise inert matter into motion. Manipulating this notion, Cavendish imputed the generative power of van Helmont’s *archeus* to matter itself. While the *archeus* is perhaps more explicable than the belief in continual divine

⁵⁸⁵ *Philosophical Letters*, 79.

⁵⁸⁶ Eileen O’Neill discusses Cavendish and occasional causes, but she does not touch on the theological motivations behind Cavendish’s discussion: see “Margaret Cavendish, Stoic Antecedent Causes, and Early Modern Occasional Causes” (2013).

⁵⁸⁷ *Philosophical Letters*, 237.

intervention, she still did not see why God would imbue matter with an immaterial principle, rather than simply have matter itself enact his plans. Squaring her theology and natural philosophy, the distinction between efficient and material causes allowed Cavendish to retain both the view that vital matter causes the natural world to function and the orthodox belief in an omniscient and omnipotent God that has ultimately determined all natural occurrences.

At one point in *Immortality of the Soul*, More distinguishes between efficient and material causes along the same lines as Cavendish, asking his reader to “suppose God created the Matter with an immediate power of moving it self, God indeed is the Prime cause as well of the Motion as of the Matter, and yet nevertheless the Matter is rightly said to move it self”.⁵⁸⁸ Yet he immediately dismisses this proposal, insisting that dull and mechanical matter is fitted to an all-pervasive Spirit of Nature. Unsurprisingly, More’s spirit of nature was closely modelled on the Pythagorean-Platonic world-soul and van Helmont’s *archeus*, and Glanvill explicitly overlays these principles when he writes to Cavendish that all motion can be “ascribed to the Soul of the World, which possibly is the great *Archeus* that formes Plants, Animals, and other more curious *Phoenomena*”.⁵⁸⁹ Distancing herself from her previous discourse, Cavendish similarly recognises that More’s belief in “natural Immaterial Spirits doth proceed from Chymistry, where the extracts are vulgarly called Spirits”.⁵⁹⁰ She finds More’s Spirit of Nature to be even more ambiguous than the *archeus*, however, since it is not natural at all but an immaterial

⁵⁸⁸ *Immortality of the Soul*, 34-5.

⁵⁸⁹ *Letters and Poems*, 140.

⁵⁹⁰ *Philosophical Letters*, 195. On Cavendish’s critique of van Helmont, see Clucas, “Cavendish’s Materialist Critique of Van Helmontian Chymistry” (2011); Fitzmaurice, “Margaret Cavendish, the Doctors of Physick and Advice to the Sick” (2003); Broad, “Cavendish, van Helmont, and the Mad Raging Womb” (2011); and O’Neill, “Introduction”, *Observations*, x-xxxvi.

principle. In contrast to Cavendish's sensitive and rational matter, More claims that "there is no *Matter* at all that is *free* and *knowing*, but moves and acts of it self (if undirected by some other Immaterial Principle) according to the mere *Mechanical* laws of *Motion*".⁵⁹¹ More's Spirit of Nature permitted him to incorporate both Descartes' mechanical matter and the Helmontian belief that an immaterial and divine force imbues the natural world with intelligence and freedom.

More reconciled the above positions by enlarging Descartes' notion that only extended things exist in the natural world to encompass immaterial substances. He reasoned that an extended thing must exist somewhere, for something cannot exist nowhere. It follows that if God exists, then He must be somewhere, and, since he is infinite, He must in actuality be everywhere, including throughout the natural world.⁵⁹² In other words, More held that the extension of space and the Spirit of Nature (which is in some senses an extension of God) are almost identical.⁵⁹³ Against More's abstract and grandiose understanding of space, Cavendish adopted the Aristotelian position that "Space is relative, or has respect to body".⁵⁹⁴ If space is only the distance between material bodies—and God is infinite and bodiless—He must not exist within the purview of the natural world, never mind being tantamount to space. According to Cavendish, insofar as extension marks material existence, the statement that God is infinite does not denote endless extension, but rather means that His being is limitless.

⁵⁹¹ More, *A Collection of Several Philosophical Writings of Dr. Henry More* (London, 1662), II, 44.

⁵⁹² See Greene, "Henry More and Robert Boyle on the Spirit of Nature" (1962), 459. Also see Henry, "Henry More versus Robert Boyle: The Spirit of Nature and the Nature of Spirit" (1989) and Jacob, "Introduction", *Henry More's Manual of Metaphysics: A Translation of the Enchiridion Metaphysicum (1679) with an Introduction and Notes*, Vol. 2 (1995), i-xxix.

⁵⁹³ See Reid, "The Evolution of Henry More's Theory of Divine Absolute Space" (2007); Jacob, "The Background and Influence of More's Doctrine of Space", *Henry More's Manual of Metaphysics*, Vol. 1, xxxvi-lxvi; and Copenhaver, "Jewish Theologies of Space in the Scientific Revolution: Henry More, Joseph Raphson, Isaac Newton and their Predecessors" (1980).

⁵⁹⁴ *Philosophical Letters*, 139. For Aristotle's similar view, see *Physics* 4.7, 213b32-14a3.

Not only is the Spirit of Nature central to More's doctrine of God, but it is also "the lowest Substantial Activity from the all-wise God, containing in it certain general Modes and Lawes of Nature for the good of the Universe".⁵⁹⁵ More accordingly postulated mechanical matter only to question whether it could be truly law-abiding without the assistance of an abstract and universal principle: the Spirit of Nature. Responding to More, Cavendish confesses that she cannot apprehend what he means by "*Common Laws of Nature*". She rather upheld the Aristotelian framework of qualities and natures, maintaining that "Nature hath but One Law, which is a wise Law, viz. to keep Infinite matter in order".⁵⁹⁶ Cavendish affirmed that God is able to intervene in the natural world, but, since the world is a well-wrought artifice, He need not expend this power. Indeed, despite advancing laws of nature, we have seen that More's population of the natural world with spirits other than the Spirit of Nature undermines the uniformity and predictability that laws are supposed to provide. More stood by the view that incorporeal spirits engage in the natural world because he considered obstructions of natural laws as much as the laws themselves to display God's continued providential guidance. Striking a more moderate register, Cavendish neither posited universal laws nor supernatural agents that regularly alter the order of things. Given More's proliferation of spirits, it is no wonder that she recanted her earlier substance theory.

⁵⁹⁵ *Collection of Several Philosophical Writings*, xvi.

⁵⁹⁶ *Philosophical Letters*, 146. See Harrison "Laws of Nature in Seventeenth-Century England: From Cambridge Platonism to Newtonianism" (2013); Oakley, "Christian Theology and the Newtonian Science: The Rise of the Concept of the Laws of Nature" (1961); Joy, "Explanations from Formal Causes to Laws of Nature" (2006); *Natural Law and Laws of Nature in Early Modern Europe: Jurisprudence, Theology, Moral and Natural Philosophy*, ed. by Daston and Stolleis (2008); and Ott, *Causation and Laws of Nature in Early Modern Philosophy* (2009).

Along with admonishing More's Spirit of Nature as tantamount to the extension of space, Cavendish contested the obverse opinion of a vacuum.⁵⁹⁷ Articulating her position, she points to a moment in *Physiologia* in which Charleton "blames *Aristotle* for saying, there are none but corporeal dimensions" in the natural world.⁵⁹⁸ Despite renouncing atoms as distinct and indivisible units, we saw in the last chapter that Cavendish was ambivalent towards the void's existence in *Philosophicall Fancies*, since material spirits still require space in which to interact. But Cavendish was finally persuaded to reject the void due to its associations with immateriality and the condemnation of Aristotle's *horror vacui* by figures such as Charleton. She was particularly concerned with refuting the vacuum's existence because its description was often virtually indistinguishable from her definition of God: "if Vacuum be not created, and shall not be annihilated, but is Uncreated, Immaterial, Immoveable, Infinite, and Eternal, it is a God".⁵⁹⁹ If God is hardly distinct from the void, then More's belief that an infinite God must either exist everywhere or nowhere would be validated. At the same time, God could not have spawned the vacuum's genesis, since a being that is defined as a creator cannot be "a Creator of Nothing, nor an annihilator of Nothing, but of Something".⁶⁰⁰ Responding chiefly to the Christian atomists, Cavendish took the argument that God could not have designed the void to adequately demonstrate its non-existence. While she rigorously distinguished physics from metaphysics, her discussion of the vacuum also displays that theology could still impact the development of her

⁵⁹⁷ The best overview of early modern theories of space and the vacuum is Grant, *Much Ado About Nothing: Theories of Space and Vacuum from the Middle Ages to the Scientific Revolution* (1981). On More's views on the void in particular, see Jenkins, "Arguing about Nothing: Henry More and Robert Boyle on the Theological Implications of the Void" (2000).

⁵⁹⁸ *Philosophical Letters*, 451.

⁵⁹⁹ *Philosophical Letters*, 453.

⁶⁰⁰ *Philosophical Letters*, 453.

natural philosophy. From a definition of God based on Biblical and Church authority, Cavendish rationally deduced the ramifications for the nature of humankind and the natural world, rejecting any physical precepts that encroached on the orthodox characterisation of the divine. By contrast, More started with humankind and the natural world and inferred what they could tell him about God and the immaterial realm. Cavendish held that such an approach could only weaken faith, since an ever-fluctuating Nature is an unstable ground upon which to infer the existence of an immutable God.

Cavendish's theologically motivated denunciation of the void at last led her to conclude that "no Part in Nature [is] Individable, no not that so small a part, which the Epicureans name an Atome; neither is Matter separable from Matter, nor Parts from Parts in General, but onely in Particulars".⁶⁰¹ She thus arrived at a version of the Aristotelian substance theory of *minima naturalia*, according to which matter can only be divided down to the smallest unit that would preserve its qualities while remaining a part of the material continuum.⁶⁰² Against More's belief that "if a body be divisible into Infinite Parts, it hath an Infinite number of extended parts", she argued that all parts of the infinite Nature are finite. For Cavendish, this is because dilation and contraction are the primary motions of *minima*, and dilation hinders "the Infinite contraction, and contraction the Infinite dilation".⁶⁰³ Just as natural bodies and their segments (such as the bones of animals or the fruits of plants) cannot be indefinitely large or small, Cavendish held that the substance composing them could not consist of indefinitely small parts. Instead of positing dichotomies and breaks in the natural world, she thus held that there is contiguity

⁶⁰¹ *Philosophical Letters*, 455. Again see Murdoch, "The Medieval and Renaissance Tradition of Minima Naturalia".

⁶⁰² On Aristotle's critique of atomism, see Hasper, "Aristotle's Diagnosis of Atomism" (2006) and Murdoch, "Aristotle on Democritus's Argument Against Infinite Divisibility".

⁶⁰³ *Philosophical Letters*, 158-9.

between observable bodies and micro-particles, commensurate with her opinion that natural distinctions are a matter of degrees rather than kinds.

We saw in the last chapter that Harvey's physiology prompted Cavendish to discuss dilation and contraction in *Philosophical and Physical Opinions*, which was a facet of her work that later roused Grew's attention. While More's ruminations on pre-existence instigated some debate surrounding psychogenesis, Harvey's discussion of preformation in *De generatione animalium* had a far wider appeal. Largely because of Harvey, seventeenth-century deliberations on substance theories in general and *minima* in particular were often conducted in relation to the theory of generation. In *Philosophical Letters*, Cavendish accordingly invokes "the Book of that most learned and famous Physician and Anatomist, Dr. *Harvey*, which treats of Generation".⁶⁰⁴ Despite explicitly referring to *De generatione* for the first time here, both the content of her early publications and Pell's assumption that Charles Cavendish had "seene Mr Hobbes his Leviathan & Dr Harvey's new booke de generatione Animalium" in 1651 suggests that she may have been long acquainted with it.⁶⁰⁵ Harvey's work and especially *De generatione*, in any event, almost certainly inspired Cavendish's notion that *minima* functioned through dilation and contraction. Relying heavily on Aristotle, Harvey accounts for the development of plants and animals by appealing to a material principle that is "so exceeding small, that in its *Diastole*, or Dilatation, it flasheth onely like the most obscure and almost indiscernable spark of fire; and presently upon its *Systole* or Contraction, it is too subtile for the eye, and quite disappeareth. So slender are the

⁶⁰⁴ *Philosophical Letters*, 419.

⁶⁰⁵ See *John Pell and His Correspondence*, 586.

first *Rudiments* of Creatures lives, which the *Plastical faculty* sets on foot”.⁶⁰⁶ He accordingly advances upon Aristotle’s understanding of generation by wedding the *minima* that cause growth and decay with the blood’s activity in the processes of systole and diastole.⁶⁰⁷

In postulating dilation and contraction as the primary motions of *minima*, Cavendish also counteracted More’s belief that the Spirit of Nature can “*contract, and dilate it self*”.⁶⁰⁸ Contraction causes a body to become more close-knit, thought Cavendish, but before *minima* turn into indivisible points they shift locations and change their inward trajectory as they meet other *minima* within the body. Conversely, a figure that consists of a critical mass of dilating *minima* gradually decomposes, causing its composite *minima* to reconfigure and contract as they join the material continuum. Due to these movements, *minima* both compose bodies and exist on a material continuum without ever running into extremes. Shifting from Harvey’s discussion of animals, vegetable life provided the observable analogy that helped Cavendish to conceptualise *minima*. Plants grow (dilate) from a small and closely compact seed, then solidify (contract) into mature and flourishing organisms, before slowly dying and returning to the ground (dilating). The very fact that such a process reoccurs each year indicates the survival of an underlying substance: the pre-existence of a material rather than an immaterial “soul”.

While it was not self-evident to all seventeenth-century thinkers that Aristotle forwarded a theory of material vitalism, Harvey’s substance theory relied heavily on a

⁶⁰⁶ *Philosophical Letters*, 419.

⁶⁰⁷ See Webster, “Harvey’s *De generatione*” and Lennox, “The Comparative Study of Animal Development: William Harvey’s Aristotelianism” (2002).

⁶⁰⁸ *Immortality of the Soul*, 11.

passage in the *De generatione animalium* in which Aristotle declared that “the faculty of the Soul of every kind has to do with some physical substance which is different from the so-called ‘elements’ and more divine than they are”.⁶⁰⁹ Interpreting Aristotle in a way that did not sit squarely with the standard Scholastic account of the four-element theory, Harvey affirms that the heat and blood involved in generation

partake of a different, and more divine substance then fire is, and therefore do not act by any *elementary faculty*; but as in the *seed* there is something which doth make it *fruitful*, and exceeds the vertues or powers of the Elements in constituting an *Animal body*; namely the *spirit* and the *nature* which is in that spirit, answerable in proportion to the *element* or *substance*.⁶¹⁰

Further developing Harvey’s *semina* along material lines, Cavendish writes that “it appears improbable if not impossible to me, that Generation should be the cause and beginning of Life, because Life must of necessity be the cause of Generation”.⁶¹¹

According to Cavendish, the condensed livelihood contained in material *semina* makes studying rational and sensitive matter—as generative principles—the most immediate way for humans to gain insights into the functions of natural bodies. Apart from Glisson, Cavendish seems to have been one of the only mid-seventeenth-century thinkers to adopt Harvey’s supra-Aristotelian vitalism.⁶¹²

Cavendish developed a theory of material vitalism in response to the widespread uptake in England of the previously peripheral theories of atomism or vital spirits that she had embraced. In fact, explaining why *minima* do not gravitate towards a centre but rather expand and contract, Cavendish writes that “all Creatures, and so Matter, desire

⁶⁰⁹ Aristotle, *Generation of Animals*, 736b30.

⁶¹⁰ *Anatomical Exercitations, Concerning the Generation of Living Creatures*, 452.

⁶¹¹ *Philosophical Letters*, 45.

⁶¹² See Glisson, *Tractus de natura substantiæ energetica* (London, 1672), 506-34.

liberty, and a Center is but a Prison in comparison to the Circumference”.⁶¹³ In keeping with her refusal to distinguish between matter and mind, Cavendish’s substance theory accords with her own intellectual impulses. We will further observe some of the philosophical motivations behind her seemingly backwards movement in the next chapter, but it is already evident from the above that her development of an Aristotelian substance theory was heavily guided by her theological concerns. In a precarious balancing act, Cavendish endeavoured to retain an orthodox theological position while carving herself a philosophical niche. In a world in which amateurs were veering away from Aristotle, she found her equilibrium by drawing on the Scholastic distinction between God and Nature while developing a theory of *minima naturalia*.

Although Cavendish ostensibly embraced *minima naturalia*, her only mention of *minima* in *Philosophical Letters* comes as a refutation of an author who “speaks much of Minima’s, viz. That all things may be resolved into their minima’s, and what is beyond them, is nothing, and that there is one maximum, or biggest, which is the world”.⁶¹⁴ This passage could be read as a critique of More’s idea of divisibility, but he is not her chief target. She instead undertakes a 26-page critique of “the Book of your new *Author* that treats of Natural Philosophy”, or the work of another physician named Harvey: the Oxford and Leiden educated Gideon Harvey and his first publication, *Archelogia philosophica nova*.⁶¹⁵ As a corollary to the notion that all matter constantly dilates and contracts on a material continuum, Cavendish argues against Harvey that there is “no

⁶¹³ *Philosophical Letters*, 465.

⁶¹⁴ *Philosophical Letters*, 461.

⁶¹⁵ *Philosophical Letters*, 456. Despite the fact that he produced multiple significant works that were popular during the seventeenth century, there is currently no scholarship on Gideon Harvey that extends beyond biographical information. For the latter, see Cantlie, “Gideon Harvey” (1921) and Wallis, “Gideon Harvey”, *ODNB*.

such thing, as biggest and smallest in Nature, or in the Infinite matter; for who can know how far this World goes, or what is beyond it?”⁶¹⁶ Cavendish’s refusal to discuss that which is “biggest” or “smallest” accords with Scholastic the view that matter could potentially split into an infinite quantity of parts, but that the material continuum only actually divides into visible figures. By contrast, Harvey’s position that the world is the biggest mass in the universe—and that anything beyond it is infinite—suggests either Glanvill’s confounding of world and Nature or Charleton’s belief in an infinite vacuum. Drawing on the Aristotelian tradition in which an infinite and eternal Nature played an integral role—marking the distinction between physics and metaphysics—Cavendish held that the natural world as a totality is infinite.

Moving from the maximum to the minimum, Harvey states that elements “are constituted out of Indivisibles, Points, or *minima*’s, so they are dissolveable into the said Indivisibles”.⁶¹⁷ While Harvey places himself within the Aristotelian tradition by discussing *minima*, his references to “points” and “indivisibles” implies that he actually used “*minima*” as synonymous with “atom”.⁶¹⁸ As Cavendish puts it with a heavy dose of irony, “I must ingeniously confess, I am not so high learned, as to penetrate into the true sense of these words; for he says, they [*minima*] are both divisible, and indivisible, and yet no atomes, which surpasses my Understanding”.⁶¹⁹ Even in her early work, we have seen that Cavendish followed Gassendi in rejecting point atomism. Yet, precisely because she incorporated elements from the tradition of *minima naturalia* in *Poems, and Fancies*,

⁶¹⁶ *Philosophical Letters*, 461.

⁶¹⁷ See Harvey, *Archeologia philosophica nova, or, New principles of philosophy* (London, 1663), “Natural Philosophy”, Part II, Book I, 31.

⁶¹⁸ On the tradition of Aristotelian atomism, see Lüthy, “An Aristotelian Watchdog as Avant-Garde Physicist: Julius Caesar Scaliger” (2001).

⁶¹⁹ *Philosophical Letters*, 461.

it was imperative that she refuted the likes of Harvey, in order to distinguish her current position from her earliest publication.

While Cavendish defined her substance theory against Harvey's notion of *minima*, it should come as no surprise that Digby was the chief proponent of Aristotelian atomism, since it was mainly in the chymical tradition that the theory of *minima* was manipulated along atomic lines.⁶²⁰ In his *Two Treatises*, Digby avers that anyone who reads Aristotle's "bookes of Generation and Corruption" will see that elements are combined "*per minima*; that is in our language and in one word, by atomes".⁶²¹ While Digby almost certainly proved a source of inspiration for Gideon Harvey, neither William Harvey nor Cavendish agreed with Digby's interpretation of Aristotle's *De generatione et corruptione*. The recognition of Digby's departure from Aristotelian-Scholastic philosophy can be detected in two poems "On Sir Kenelme Digby" that are in the hand of John Rolleston (a scribe to the Cavendishes) and bound in one of William's manuscripts. The first of these poems concludes with the assertion that "The next way then to knowledge, It must bee, / To leave all Schooles and for to study Thee".⁶²² Stressing his deviation from Scholastic philosophy, Digby is somewhat flippantly eulogised for developing ideas that surpass anything taught in the universities.

William Harvey produced a far more scathing refutation of the Aristotelian atomists, finding that he was hardly able "refrain my pen from rebuking" those "who constitute all things out of the confluence of *Atomes*".⁶²³ For Cavendish's part, rather than explicitly critique her friend Digby, she targeted Gideon Harvey both for the reason that

⁶²⁰ See Newman, *Atoms and Alchemy: Chymistry and the Experimental Origins of the Scientific Revolution* (2006), especially 27-31 and 165-8.

⁶²¹ Digby, *Two Treatises* (London, 1644), 343. Also see Levitin, *Ancient Wisdom*, 369-72.

⁶²² See MS Pw V 25, ff. 9r and 10r.

⁶²³ *Anatomical Exercitations, Concerning the Generation of Living Creatures*, 467.

he was a late example of an Aristotelian atomist and because he believed that *minima* “could be reduced to one *minimum*; and from one *minimum* to the essence of a spirit or to nothing” through a process of penetration.⁶²⁴ By claiming that *minima* are so subtle that they can turn into spirits or even disappear, Harvey undermined his own concept of atomic *minima* as individual points and supplied Cavendish with further justification for rejecting material spirits. What is more, while Harvey advocated philosophical and physiological novelty (as the *nova* of his title suggests), Cavendish points out that he “argues after the accustomed Scholastical way, with hard, intricate, and nonsensical words”.⁶²⁵ Because she considered the likes of Gideon Harvey to have made such Scholastic language meaningless, Cavendish followed William Harvey in developing an Aristotelian substance theory without mentioning *minima*.

Although Cavendish sought to place critical distance between her substance theory and Gideon Harvey’s notion of *minima*, she would have appreciated that he adapted Aristotelian ideas. By contrast, under the influence of Gassendi, Charleton was of course both a proponent of the atomic hypothesis and a vocal anti-Aristotelian. Partly as the result of their divergent intellectual orientations, we have seen that the relationship between Cavendish and Charleton was far from straightforward, with Charleton’s epistles regularly serving as subtle censures of her work. Overlooking her movement towards an Aristotelian orientation over the course of the 1660s, Charleton levies a critique of Aristotle and the Scholastics in his lengthy letter to Cavendish from 1667. He explains that her natural philosophy will never be integrated into the university curriculum due to “those canting Politicians, the School-men” who have

⁶²⁴ *Archeologia philosophica nova*, Part II, Book I, 105.

⁶²⁵ *Philosophical Letters*, 456.

made a vest for the Church, of a kind of Drugget, con[si]sting of the thrums of the Peripatetic Maxims, cunningly interwoven among the golden threads of the Christian faith; & so far prevaild upon Princes, as to make it piacular, for any Scholar to appear with his judgement clad in any other livery: it is not very likely, the Professors there will soon be brought to offend their Superiors, by laying aside the defence of Aristotles Tenets, to assume the patronage of yours.⁶²⁶

It should now be clear that this passage presents a double mischaracterisation of Cavendish's approach to "*Peripatetic* Philosophy". She was not the prophet of a "new" philosophical school, and her physics and metaphysics followed many of "*Aristotle's* Maxims". At the same time, Cavendish thought that blaming Aristotle (or even the Scholastics) for mingling philosophy and theology was simply a smoke screen for "natural Theologers" who made their own "gallamalfry of Philosophy and Divinity".⁶²⁷ Interesting in this regard is that Glanvill wrote to More probably in 1668 that he "was last weeke with D^r Charleton; who laughs att y^e Notion of Spirrits", admitting that he wonders at this "in one y^t hath writt a booke of o^{ur} Immortality", referring to his 1657 *The Immortality of the Human Soul*.⁶²⁸ As Glanvill intimates, Charleton simply promoted another kind of natural theology: he did not integrate immaterial spirits into the natural world, but rather deployed physiological and philosophical principles to substantiate the immaterial. Cavendish considered both of these natural theologies to be more Platonic than Scholastic, however, because they distorted the disciplinary distinction between natural philosophy and theology.⁶²⁹

⁶²⁶ See MS Smith 13, ff. 49v-50r and *Letters and Poems*, 113-4. For a fuller account of Charleton's opposition to how Aristotle is taught in the universities, see MS Smith 13, ff. 40r-52r.

⁶²⁷ *Philosophical Letters*, 491.

⁶²⁸ Pierpont Morgan Library, MS MA 4322, ff. 1v. Many thanks to Rhodri Lewis for this reference.

⁶²⁹ On the versions of seventeenth-century natural theology, see Mandelbrote, "The Uses of Natural Theology in Seventeenth-Century England" (2007) and Rivers, "'Galen's Muscles': Wilkins, Hume, and the Educational Use of the Argument from Design" (1993). For some important correctives, see Levitin, "Rethinking English Physico-Theology: Samuel Parker's *Tentamina de Deo* (1665)" (2014).

Cavendish's most vigorous criticism of natural theology—and especially More and Glanvill's population of the natural world with immaterial spirits—is that it could eventually “bring in again the Heathen Religion, and make us believe a god *Pan*, *Bacchus*, *Ceres*, *Venus*, and the like”.⁶³⁰ One of the supposed benefits of natural theology was that it could be mobilised to convert pagans of the Americas and the Near East, who did not respect the authority of scripture.⁶³¹ But if natural theology was of any value in converting pagans, Cavendish argued, this was only because it compromised with the heathen religions. She feared that the Platonic ecstasy that was supposed to ensue from both observing natural order and its miraculous disruptions—by gold-like agents—could result in the worship of the natural world.⁶³² Not simply commencing with her critique of More, Cavendish's defiance of polytheism is predicated on a distinction between “atheism” and “superstition” that is evident throughout her oeuvre. Alluding to Matthew 7:13, she writes in *The World's Olio* that the righteous should “Turn not to the right hand nor to the left, lest you go the wrong way; for extremes in devotion run to superstition and idolatry: and the neglect in both Atheisme, but to keep the even way, is to obey God”.⁶³³ For Cavendish, superstition is aligned with the polytheistic integration of immaterial principles into the natural world, whereas atheism springs from the postulation of a God so abstract that He becomes almost superfluous. More himself refers

⁶³⁰ *Philosophical Letters*, 145. On early seventeenth-century polytheism, see Popkin, “The Crisis of Polytheism and the Answers of Vossius, Cudworth, and Newton” (1990) and Seznek, *The Survival of the Pagan Gods: The Mythological Tradition and its Place in Renaissance Humanism and Art* (1981).

⁶³¹ See Poole, “Seventeenth-Century Preadamism” and Gliozzi, *Adamo e il Nuovo Mondo: la nascita dell'antropologia come ideologia coloniale: dalle genealogie bibliche alle teorie razziali (1500-1700)* (1977), 514-94.

⁶³² For relevant discussions, see Sheehan, “Sacred and Profane: Idolatry, Antiquarianism and the Polemics of Distinction in the Seventeenth Century” (2006); Mulsow, “Idolatry and Science: Against Nature Worship from Boyle to Rüdiger” (2006); and Miller, “Taking Paganism Seriously: Anthropology and Antiquarianism in Early Seventeenth-Century Histories of Religion” (2001).

⁶³³ *The World's Olio*, 34.

to the contiguity between pious adoration and the denial of God's existence when he writes that some of those who speak of "the unconceiveableness and utter incomprehensibleness of the Deity" do so to make "a devotional exaltation of the transcendency of his nature, the other to make the belief of his existence ridiculous, and craftily and perversly to intimate that there is no God at all".⁶³⁴

Despite her claims to steer a middle way, scholars have frequently shaped Cavendish as heterodox by appealing to a passage in *The World's Olio* in which she states that it "is better, to be an Atheist, then a superstitious man, for in Atheisme there is humanitie, and civility, towards man to man; but superstition regards no humanity, but begets cruelty to all things, even to themselves".⁶³⁵ We looked at Bacon's influence on Cavendish in the first chapter, and saw that she was especially interested in *De sapientia veterum* and his *Essayes*. Cavendish's reflections on atheism in her own book of essays are in all probability borrowed from Bacon's "Of Superstition", in which he writes that "Atheisme leaves a Man to Sense; to Philosophy; to Naturall Piety; to Lawes; to Reputation; All which may be Guides to an outward Morall vertue, though *Religion* were not; But *Superstition* dismounts all these, and erecteth an absolute Monarchy, in the Minde of Men".⁶³⁶ Rather than reading these as apologies for atheism, both Cavendish and Bacon should be understood as vehemently rejecting superstition.

Cavendish in fact considered atheism to be less of a peril to religious orthodoxy than More's superstitious polytheism precisely because she denied the very existence of atheists. In *The Blazing World*, the Empress queries the spirits "whether there were any

⁶³⁴ *Immortality of the Soul*, 20-1.

⁶³⁵ *The World's Olio*, 46. See Wilson, *Epicureanism at the Origins of Modernity*, 27-30; Walters, *Margaret Cavendish: Gender, Science and Politics*, 133-4; and Battigelli, *Margaret Cavendish and the Exiles of the Mind*, 55-6.

⁶³⁶ *OFB, Vol. 15: The Essayes*, 54. Also see Kusakawa, "Bacon's Classification of Knowledge" (1996).

Atheists in the World” and is told “that there were no more Atheists then what Cabbalists make”.⁶³⁷ Following from this, one of Cavendish’s most cogent criticisms of More in *Philosophical Letters* is a contradiction in his treatment of atheism. Referring to Book 1 in his *Antidote Against Atheism*, Cavendish quotes More as stating that “*there is no man under the cope of Heaven but believes a God*”.⁶³⁸ On the other hand, she notes that “the onely design of his Book called *Antidote*, is to prove the Existence of a God, and to refute, or rather convert Atheists”.⁶³⁹ Responding to More, Cavendish argues that Nature as a whole must be the sum of its parts inasmuch as all matter sits on a material continuum. Since God created the natural world, she believes that its innated matter must know that He exists: “if nature believes a God, all her parts, especially the sensitive and rational, which are the living and knowing parts, and are in all natural creatures, do the like”.⁶⁴⁰ Rather than deeming each piece of matter to be god-like—as Cavendish insinuated in earlier works—these two premises led her to conclude that there is a universal belief in God.

Because she denied the existence of atheists, Cavendish accounted More’s attempts to uncover and convert unbelievers to be counterproductive. She argued that “by avoiding to be Atheists” we will “become Pagans, and so leap out of the Frying-pan into the Fire, as turning from Divine Faith to Poetical Fancy; and if *Ovid* should revive again, he would, perhaps, be the chief head or pillar of the Church”.⁶⁴¹ Here Cavendish suggests that More’s attempt to arm himself against an imaginary legion of unbelievers with spirits that resemble the deities of ancient mythology means that not only his cabala but also his

⁶³⁷ *The Blazing World*, 77.

⁶³⁸ *Philosophical Letters*, 187.

⁶³⁹ *Philosophical Letters*, 187.

⁶⁴⁰ *Philosophical Letters*, 138.

⁶⁴¹ *Philosophical Letters*, 218-9.

theology hardly transcends the bounds of poetry.⁶⁴² Not blind to the fact that the established distinction between atheism and superstition could be harnessed to shape him as an enthusiastic polytheist, More begins his *Antidote Against Atheism* by writing that “*Atheisme* and *Enthusiasme* though they seeme so extreamely opposite one to another, yet in many things they do very nearly agree”.⁶⁴³ Proactively defending himself, More declares that he is “no more to be esteemed an *Enthusiast* for such passages as these, then those wise and circumspect Philosophers, *Plato* and *Plotinus*, who upon the more then ordinary sensible visits of the divine Love and Beauty descending into their enravish’d soules, professe themselves no lesse moved”.⁶⁴⁴ But Cavendish agreed with Casaubon that “*Plato* himself naturally, had much in him of an *Enthusiast*”.⁶⁴⁵ With his assaults on atheism, Cavendish believed that More not only redefined enthusiasm but also aspired to readjust orthodoxy to make polytheism a lesser evil.

Indicating that figures such as More had some success in their realignment of orthodoxy, Cavendish’s sometimes-sympathetic comments about atheism have not only misled modern scholars but even served as fodder for the amusement of a handful of her contemporaries. This is evident from two copies of an “An Epitaph on the Duches of New castle” held in the Bodleian Library, which are in the hands of Elias Ashmole and John Stainsby respectively.⁶⁴⁶ These nearly identical poems both start with the lines: “Her^e lyes Wise, Chast, Hospitable, Humbl^e / I had gon on but Nick began to grumble, / Writ^e, writ^e, sayes he upon her Tomb^e of Marble / Those words, w^{ch} out I & my friends

⁶⁴² See Hunter, “The Problem of ‘Atheism’ in Early Modern England” (1985).

⁶⁴³ More, *Antidote Against Atheism* (London, 1655), A4r.

⁶⁴⁴ *Antidote Against Atheism*, B1r.

⁶⁴⁵ Casaubon, *A Treatise Concerning Enthusiasm* (London, 1655), 8.

⁶⁴⁶ For a fuller analysis of this epitaph and the issues surrounding it, see Begley, “The Damnation of Margaret Cavendish: Versions of a Satirical Epitaph” (2016).

will Warble”. In all likelihood, the “Nick” of this passage is Nicholas Burghe, who was a friend of Ashmole and a fellow collector and author of epitaphs, many of which were of a misogynistic character.⁶⁴⁷ The most probable scenario regarding its composition is that Burghe shaped it in mock imitation of the many commemorative epitaphs in the *Collection of Letters and Poems*. He subsequently recited it to Ashmole and Stainsby who scribbled it onto unused pages in their manuscripts, integrating their process of transcription into the poem itself. Questions of composition aside, in this satirical epitaph Cavendish is

This great Atheisticall Philosophraster,
That owns no^e God, no^e Devill, Lord nor Master.
Vice’s Epitomy & Virtue’s fo^e,
Her^e lyes her Body but her Soule’s b^e Low.⁶⁴⁸

While it was almost certainly written after her death and did not circulate as widely as has often been assumed, this poem does imply that Cavendish was occasionally subject to accusations of atheism, even years after she had gone to lengths to confirm her orthodoxy. That said, it is notable that Ashmole venerated John Dee and was enchanted by spiritual chymistry more generally. A characterisation that Casaubon responds to directly in the postscript to his *True & Faithful Relation*, Ashmole writes in *Theatrum Chemicum Britannicum* that “*Doctor Dee*” was a “*Man of cleere Understanding, quick Apprehension, an excellent Wit, and of great propensity to Philosophicall Studies*”.⁶⁴⁹ Ashmole, then, had good reason to dislike Cavendish’s negative characterisation of superstition and the Platonic and chymical discourses that sometimes accompanied it.

⁶⁴⁷ See, for example, Bod., MS Ashmole 38, 36v-7r.

⁶⁴⁸ Bod., MS Ashmole 36, 186v and MS Ashmole 1463, 1r.

⁶⁴⁹ Ashmole, *Theatrum Chemicum Britannicum* (London, 1662), 479 and *True & Faithful Relation*, 12r. Also see Feola, “Elias Ashmole’s Collections and the Views about John Dee” (2012).

More serious than such manuscript doggerel was Cudworth's condemnation of "hylozoist atheism" in his *True Intellectual System* that we looked at in the last chapter. In 1679, the year after Cudworth diagnosed hylozoism, More published his Latin *Opera Omnia*. While he may not respond to Cavendish directly, he manipulated Cudworth's discourse in this work to offer his own sustained critique of Glisson's substance theory.⁶⁵⁰ In the process of critiquing Glisson on his own grounds, More supplied a reading of Aristotle that united that which Cavendish had been at pains to sever. Throughout this chapter, we have seen that Cavendish considered Platonists to postulate immaterial spirits (whether the *anima mundi*, *archeus*, or the Spirit of Nature) that caused the natural world to function, whereas Aristotelians imputed vital principles to matter itself. Challenging this distinction, More argued in his *Opera Omnia* that the passage from Aristotle's *De generatione animalium* that Harvey appealed to in his own *De generatione* shows that Aristotle was an immaterial vitalist. Aligning Aristotle's animating power with his own Spirit of Nature, More upturned Hobbes's materialist reading of *Metaphysics* by arguing that, for Aristotle, metaphysics was the study of incorporeal substances as first causes.⁶⁵¹ Either misunderstanding Cavendish's position (despite the steps she took to guard herself against charges of immaterialism) or similarly endeavouring to align material and immaterial animism, Glanvill attempts to find a common ground with her by writing that he is also "not so fond a mechanist, as to suppose all the *Phoenomena* of the World to be

⁶⁵⁰ See More, *Opera philosophica*, Vol. 1 (London, 1676), 601-11. Also see Henry, "Medicine and Pneumatology", 28-32.

⁶⁵¹ "Quòd autem heic Harvaeus Divinum quid subesse autumet in istis vocibus indè fieri censeo, quòd Aristoteles, intelligens Principium verèque Divinum in solis Caelis constituerit" (*Opera philosophica*, Vol. 2, 374).

raised merely by those Laws; but most of them perhaps by a Principle that is vital; And the *Anima Mundi* I take to be a very likely, and convenient *Hypothesis*”.⁶⁵²

In shaping Aristotle as an immaterial vitalist, More (and perhaps Glanvill) was borrowing from Gassendi, whose *Syntagma philosophicum* famously accused Aristotle of believing in an *anima mundi*.⁶⁵³ For Gassendi, shaping Aristotle as an immaterial vitalist was a way to turn all ancient philosophers into adulterous worshipers of nature, implicating them in the charges of impiety that had long ensnared Epicurus.⁶⁵⁴ Cavendish followed Gassendi insofar as she deemed the infusion of incorporeal principles into the natural world to be a step towards nature-worship, but she held that Aristotle was the ancient philosopher whose ideas were most commensurate with the needs of the Anglican Church precisely because he resisted such a move. Undoubtedly with More and Glanvill still in mind, Cavendish drew on Thomas Stanley’s *History of Philosophy* to directly deny that Aristotle considered there to be “a Soul diffused through the world” in her slightly later *Observations*.⁶⁵⁵

While striving to clearly distinguish between the material and immaterial realms, Cavendish also drew attention to the similitude between More’s spirits and the material “gods” from *Philosophicall Fancies* when she writes that his spirits “rule and govern infinite corporeal matter, like so many demy-Gods, by a dilating nod, and a contracting frown”.⁶⁵⁶ Suggesting the degree to which she desired to distance herself from her previous discourse, Cavendish not only expunged all references to “spirits” in her 1663

⁶⁵² *Letters and Poems*, 102.

⁶⁵³ “Ex quo obiter intelligitur videri posse facile Aristotelem pertrahi ad opinionem de Anima Mundi” (*Syntagma philosophicum*, *Opera Omnia*, Book II, 243).

⁶⁵⁴ See Levitin, *Ancient Wisdom*, 416-8.

⁶⁵⁵ *Observations*, 268.

⁶⁵⁶ *Philosophical Letters*, 195.

republication of *Philosophical and Physical Opinions*, but she also removed the passage in which she intimated that sensitive matter was like so many gods to dull matter. In this regard, it was a shrewd rhetorical manoeuvre to underscore that More's immaterial spirits more closely resembled gods than her material spirits ever did. By showing that More (a figure within the Church) manipulated Platonic spirits and the Origenian pre-existence of souls to produce a theology that was more heterodox than even her most unconventional utterances, Cavendish attempted to foreclose any charges of impiety that could be levelled against her early work.

All the same, there is a sense in which, for Cavendish, More was not to be wholly blamed for slipping into heterodoxy. Whereas we have seen that Cavendish considered atheism to be an illusory adversary, she did not preclude the possibility that matter could lead to the belief in more than one God. She writes in *Philosophical Letters* that "natural men being composed of many divers parts, as of several motions and figures, have divers and several Ideas, which the grosser corporeal motions conceive to be divers and several gods, as being not capable to know the Great and Incomprehensible God, who is above Nature".⁶⁵⁷ Cavendish makes at least two significant points here. First, she subtly shifts the reference to "gods" from her earlier works, clarifying that only the dullest parts conceive of innated matter as god-like. This is because dull matter is the eternally existent raw material from which God extracted the knowing parts of the creation. Second, she indicates that someone who envisages a multiplicity of gods is composed of more dull than innated matter, flippantly insinuating that More's postulation of spirits makes him "dull" instead of incorporeal. Like enthusiasm, she saw polytheism as a medical condition, based on the material structure of human beings. Every being is,

⁶⁵⁷ *Philosophical Letters*, 503.

however, partly composed of the rational and sensitive matter that God originally endowed with vitality. Because of this, each individual has the capacity to recognise that dull matter causes deception, which should lead to humble faith in a single, immaterial, and incomprehensible God.

3.3. Religious Controversy and “Latitudinarianism”

For all his pretences, Cavendish suspected that More was more concerned with producing theological works “to shew Learning, and exercise his Wit”, than to elucidate religious truths or convert atheists. Denying that More treated the calling of the divine with adequate gravity, Cavendish proceeds to state that there are other subjects with which he could showcase his wit “with more profit, and less danger, then by proving Christian Religion by Natural Philosophy, which is the way to destroy them both”.⁶⁵⁸ Undergirding her critique of More’s natural theology was his fluctuating religious orientation. Being shaped as a “Cambridge Platonist”, More has often been seen as a precursor to “latitudinarian” theology: a term that has been taken to denote a trust in rational argumentation, a use of “scientific” explanations, and a belief in political and ecclesiastical moderation.⁶⁵⁹ Yet, during the Restoration, the term “latitudinarian” was applied rather more pejoratively, referring to thinkers who were willing to adapt their theological and political ideas to suit personal ends.⁶⁶⁰

⁶⁵⁸ *Philosophical Letters*, 221.

⁶⁵⁹ Some examples of this discourse are Hutton, “Edward Stillingfleet, Henry More, and the Decline of *Moses Atticus*” (1992) and Levine, “Latitudinarians, Neoplatonists, and the Ancient Wisdom” (1992).

⁶⁶⁰ On the non-existence of “Latitudinarianism” as a theological or philosophical identity, see Spurr, “‘Latitudinarianism’ and the Restoration Church” (1988) and Hunter, “Latitudinarianism and the ‘Ideology’ of the Early Royal Society: Thomas Sprat’s *History of the Royal Society* (1667) Reconsidered” (1992).

The likes of More were seen as carelessly shifting their doctrinal and ecclesiastical allegiances so as to retain their positions in the Church and universities throughout the upheavals of the Interregnum. Cavendish deemed More's discontent "with what God has been pleased to reveal in his holy Word" to follow from "Man being naturally ambitious, and endeavouring to excel each other". Instead of strengthening the bonds of religious unity, she held that manipulating scripture for personal ends would only lead to further controversies, and that "in things Divine, Disputes do rather weaken Faith, then prove Truth, and breed several strange opinions".⁶⁶¹ It was this opposition to open religious debate that led her to write off Susan Du Verger's 1657 *Humble Reflections Upon Some Passages of the Right Honorable the Lady Marchionesse of Newcastle's Olio*—a folio-length retort of Cavendish's reflections on monasticism—as "a Hermaphroditical" or unnatural book.⁶⁶² In light of her aversion to religious controversy, some scholars have even described Cavendish as a "latitudinarian", which they take to mean that she advocated religious tolerance.⁶⁶³ If we apprehend the term historically, however, More's religious latitude is in fact one of the aspects of his life and thought that she most fervently contested.

Throughout *Philosophical Letters*, Cavendish repeatedly endorses the three creeds and the Thirty-Nine Articles of Religion that were printed in the Authoritative 1662 Book of Common Prayer. Instead of voicing a "latitudinarian" inclination, Cavendish's numerous expressions of distaste for religious dissent strongly resemble "His Majesty's

⁶⁶¹ *Philosophical Letters*, 221.

⁶⁶² *Philosophical Letters*, C1r. Du Verger, *Du Vergers Humble Reflections Upon Some Passages of the Right Honorable the Lady Marchionesse of Newcastle's Olio* (London, 1657). Also see Narramore, "Du Vergers Humble Reflections and Dedicatory Epistles as Public Sphere" (2013).

⁶⁶³ See Fitzmaurice, "Paganism, Christianity, and the Faculty of Fancy in the Writing of Margaret Cavendish" (2014) and Rogers, *The Matter of Revolution*, 177-211.

Declaration” from the beginning of this book. Here it is written that the Crown is “to conserve and maintain the Church committed to Our Charge, in Unity of true Religion, and in the Bond of Peace; and not to suffer unnecessary Disputations, Altercations, or Questions to be raised, which may nourish Faction both in the Church and Commonwealth”.⁶⁶⁴ Cavendish’s resistance to religious disputation (especially among laypeople) did not follow from a stance of tolerance, but rather from a conviction that only compliance with the established order could safeguard social and political stability. The fact that the 1662 Act of Uniformity was stricter than the articles of other European Reformed churches suggests that Cavendish was not alone in believing that ecclesiastical severity was necessary to avoid religious discord and to promote peace.⁶⁶⁵ It is also notable that William Cavendish’s manuscript treatise to Charles II upon his return to the throne warns the monarch to be weary of “Popery, or Presbetry” in re-establishing the Church, since religious “controversey is a Civill warr wth y^e pen, w^{ch} pulls out y^e sword soone afterwards”. William also advises him to take “great care of y^e universeties, no heads of houses, But orthodox, nor [^ no] student that is of an other opinion but Expell him the universety”.⁶⁶⁶ Likewise, pointing to the universities as spheres that should uphold religious orthodoxy, Margaret makes it clear that those who “wander from the Schools, and follow new and unknown ways, are, in my opinion, not Orthodoxes, but Hereticks”.⁶⁶⁷ Cavendish’s Aristotelian orientation and her approval of fixed dogmas may initially appear incompatible with her emphasis on the compounding of ideas and the

⁶⁶⁴ On the dating of this declaration, see Hardwick, *Hardwick's History of the Articles* (1859), 201.

⁶⁶⁵ See Goldie, “The Theory of Religious Intolerance in Restoration England” (1991); Walsham, *Charitable Hatred: Tolerance and Intolerance in England, 1500-1700* (2006); and Spurr, “The Church of England, Comprehension and the Toleration Act of 1689” (1989).

⁶⁶⁶ Bod., MS Clarendon 109, ff. 12v and 15r. On this treatise, see Condren, “Casuistry to Newcastle”.

⁶⁶⁷ *Philosophical Letters*, 377. On the relationship between religious and medical heterodoxy, see Schuler, “Some Spiritual Alchemies of Seventeenth-Century England” (1980) and the introduction to and essays in *Heterodoxy in Early Modern Science and Religion*, ed. by Maclean and Brooke (2005).

interaction between a multiplicity of qualitatively distinct material principles. Yet, by the time that she wrote *Philosophical Letters*, she considered a few philosophical and theological foundations to be necessary for natural, social, and religious stability.

Cavendish's Reformed theology, however, still provided her with ample room to tackle philosophical questions without challenging the established order by overindulging in theological speculations. Showing the theological care with which she constructed her natural philosophy, Cavendish took up a theory of *minima naturalia* in part to clarify that, even if the belief in God (or gods) is intrinsic to matter, religion is not an isolated and egoistic practice of self-reflection. Because of the material continuum, each piece of substance relies on the rest of the eternally existing matter for its continued existence, enabling her to openly repudiate an anarchistic plurality of material spirits. Assessed from a macro perspective, Cavendish's theory of *minima naturalia* implies the possibility of a cohesive and sociable religious foundation erected from shared traditions, ceremonies, and articles of faith, even if the duller parts of matter tend towards idolatry.

To conclude, we can place Cavendish's ideas on the horizon of some learned scholars and divines with whom she had contact. In opposition to More's Platonic rationalism, Cavendish aligned herself with thinkers such as his fellow Cambridge divine, Isaac Barrow, who maintained that theological dogmas could not be vindicated, but must be embraced on faith and authority.⁶⁶⁸ As a fellow of Trinity College, Cambridge, Barrow is indeed named in a Latin letter to Cavendish that thanks her for sending books to the college. Cavendish would have been pleased to find that this epistle recognises her desire to uncover errors, reduce disagreements, and restore peace to the Republic of Letters, in

⁶⁶⁸ See Barrow, "A Defence of the B[lessed] Trinity", *Theological Works of Isaac Barrow*, Vol. 4 (1830), 492-523 and Simon, "The Preacher" (1990).

part by avoiding religious disputation.⁶⁶⁹ Well into the seventeenth century, the curriculum at Oxford and Cambridge was rooted in Aristotelian thought.⁶⁷⁰ Reformed Anglican figures, including many Church of England bishops, were also heavily represented in Oxford, which explains why Cavendish aligned heresies and divergences from the schools.⁶⁷¹ It is Cavendish's appreciation of the universities, religious conformity, and Aristotelian metaphysics that left her to be courted by distinguished institutional figures.

One such powerful figure that we have encountered in previous chapters is Thomas Barlow. Bestowing works to the Bodleian from outside the university, Barlow compares Cavendish to "that first principle from whence they [her ideas] flow".⁶⁷² Another Oxford divine, Barlow's chief Anglican ally, and the principal of St. Edmund Hall, Thomas Tully, also wrote to Cavendish upon receiving gift copies from her that the "Books you condescended to bestow upon me have turned a sorry Study into a rich Library".⁶⁷³ These books seem to have been personal gifts to Tully, whose copy of *Philosophical and Physical Opinions*—which was carefully hand-corrected by Cavendish—he annotated with the names of potential translators for her works.⁶⁷⁴ What is more, given that Cavendish endeavoured to cultivate an acquaintance with such

⁶⁶⁹ "Ob profligatos errores, sublata dogmatum dissidia & pacem reipublicae literariae restitutum" (*Letters and Poems*, 32-4).

⁶⁷⁰ On Aristotle and the universities, see Costello, *The Scholastic Curriculum at Early Seventeenth-Century Cambridge* (1958) and Schmitt, *The Aristotelian Tradition and the Renaissance Universities* (1984). Important revisions can be found in Feingold, "Aristotle and the English Universities".

⁶⁷¹ See Beddard, "Restoration Oxford and the Remaking of the Protestant Establishment" (1997).

⁶⁷² *Letters and Poems*, 69. On Barlow's theology, see Hampton, *Anti-Arminians*, especially 77-128; Champion, "An Historical Narration Concerning Heresie: Thomas Hobbes, Thomas Barlow, and the Restoration Debate Over 'Heresy'" (2006); and Muller, "Thomas Barlow on the Liabilities of 'New Philosophy': Perceptions of a Rebellious *Ancilla* in the Era of Protestant Orthodoxy" (2010). On Barlow's distinction between physics and metaphysics, see Barlow, *Exercitationes aliquot metaphysicae, de Deo: quod sit objectum metaphysicae* (Oxford, 1658), especially 91-117.

⁶⁷³ *Letters and Poems*, 95.

⁶⁷⁴ See BL, *Philosophical and Physical Opinions*, 8407.h.9. Also see Whitaker, *Mad Madge*, 258-59.

figures, it is perhaps more than a coincidence that a student of Barlow and Tully at Queen's College, Clement Ellis, became the domestic chaplain to William and Margaret from 1661.⁶⁷⁵ A minor poet himself, Ellis penned a glowing epitaph for Cavendish, which is replete with allusions to her theological and philosophical ideas.⁶⁷⁶ Even if the letters from figures such as Barlow and Tully can in part be passed off as the toils of duty, Cavendish's very decision to target such thinkers when distributing her publications not only shows their centrality to mid-seventeenth century intellectual life but also suggests that Cavendish was attempting to situate herself within a Reformed and Aristotelian tradition. While the Cavendish family had ties with Hobbes, Cavendish did not so much want to associate herself with "liberal" outsiders as "conservative" divines like Casaubon.

To the claim that Cavendish sought to align herself with the orthodoxy of such established figures, it may be objected that much of *Philosophical Letters* is spent rebutting a Cambridge divine. Yet, while More was a fellow of Christ's Church, we have seen that Cavendish critiqued More precisely because his theological orientation and his mode of Biblical exegesis in particular did more harm than good to the re-established Anglican Church and Scholastic divinity. Of note here is that Cavendish dedicated her earlier *Philosophical and Physical Opinions* "To the Two Universities", whereas she dedicated *Philosophical Letters* only "To the Most Famous University of Cambridge". In the latter, she underscores the theological elements of a Christian education, including a prayer that "your University may flourish to the end of the World, for the Service of the

⁶⁷⁵ See Green, "Clement Ellis", *ODNB*. Also see the dedication to "His Excellency William L^d Marquis of New-Castle" that prefaces *A sermon preached on the 29th of May 1661: The day of His Majestie's birth, and happy restauration* (Oxford, 1661), which is a sermon that Ellis preached at Welbeck Abbey.

⁶⁷⁶ See BL, Egerton MS 2603, 68v-69v and *Letters and Poems*, 175-7.

Church, the Truth of Religion, [and] the Salvation of Souls”.⁶⁷⁷ Meanwhile, as is evinced by the fact that most colleges still have copies of *Philosophical Letters* and its companion piece, *Sociable Letters*, Cavendish continued to bestow books upon Oxford and correspond with the likes of Barlow. Her emphasis on the “Truth of Religion” in an address to Cambridge scholars seems to be a rhetorical plea to the Arminian divines who were increasingly prevalent at this institution. That More is the only institutional figure whom Cavendish critiques in *Philosophical Letters* (or over the course of her oeuvre for that matter) further suggests that she composed her dedication as a subtle critique of a religious propensity that she opposed in Cambridge. Her work of 1664 challenges the efforts of More and his ilk—with their powerful positions at Cambridge—to supplant Reformed and Aristotelian thought in England with an enthusiastic and Platonic instantiation of Arminian theology. Despite his institutional standing, it was in many ways not Cavendish but More who was the philosophical and theological interloper.

⁶⁷⁷ *Philosophical Letters*, A2r.

Chapter 4. History: From Criticism to Satire

While scholars have often engaged with Cavendish's assessment of seventeenth-century experimentation at the beginning of *Observations Upon Experimental Philosophy*, it has been far less frequently noted that the last 44 pages are dedicated to "Observations Upon the Opinions of Some Ancient Philosophers".⁶⁷⁸ At the beginning of this section, Cavendish acknowledges the primary source for her discussion as "the works of that learned author Mr. Stanley, wherein he describes the lives and opinions of the ancient philosophers", referring to Stanley's *History of Philosophy* (published in four volumes between 1655 and 1662).⁶⁷⁹ We saw in chapter 1 that Sandys' *Metamorphoses* influenced Cavendish's earliest publications, and Stanley cites his translation and commentaries numerous times in his *History*, noting at one point that Ovid was "Englished by my Uncle, Mr. Sandys".⁶⁸⁰ Drawing on commentaries such as Sandys', Cavendish had already pieced together ideas from ancient poetry, medicine, and theology to form her natural philosophy before reading Stanley's work. Even so, the appearance of his *History*—the first vernacular volumes devoted exclusively to the history of philosophy—was a milestone that stimulated Cavendish's most direct discussion of ancient thought.

⁶⁷⁸ Some examples of the large body of literature on Cavendish's critique of Hooke and the early Royal Society are Keller, "Producing Petty Gods: Margaret Cavendish's Critique of Experimental Science" (1997); Lawson, "Bears in Eden, or, This Is Not the Garden You're Looking For: Margaret Cavendish, Robert Hooke and the Limits of Natural Philosophy" (2015); Dear, "A Philosophical Duchess: Understanding Margaret Cavendish and the Royal Society" (2007); Sarasohn, "The Microscopist as Voyeur: Margaret Cavendish's Critique of Experimental Philosophy" (2014); Wallwork, "Margaret Cavendish's Response to Robert Hooke's *Micrographia*" (2001); and Aït-Touati, *Fictions of the Cosmos*, 174-90. A useful antidote to this discourse is Wilkins, "Margaret Cavendish and the Royal Society" (2014).

⁶⁷⁹ *Observations*, 249. While what follow will use O'Neill's edition of *Observations*, it sadly omits a section of Cavendish's work and does not include *The Blazing World*, suggesting a distinction between philosophy and literature that Cavendish resisted. Along with the discussion that follows, see Santana, "'Two Opposite Things Placed Near Each Other, Are the Better Discerned': Philosophical Readings of Cavendish's Literary Output" (2015).

⁶⁸⁰ Stanley, *The History of Philosophy* (London, 1655), Vol. III, Part I, 106.

The first part of this chapter looks at how Cavendish used the history of philosophy to scrutinise the natural history of her contemporaries. Since it predates Sprat's and Glanvill's semi-official defences of the Royal Society, the critique of experimentation in *Observations* is primarily aimed at Hooke's 1665 *Micrographia*, with its prefatory justification of experimental methodologies. Reflecting Grew's juxtaposition of transcriptions from the works of Cavendish and Stanley in his commonplace book, Hooke placed volume three of Stanley's *History* directly beside Cavendish's *Philosophical and Physical Opinions* and *Observations* in his library catalogue (and presumably in his library).⁶⁸¹ Stanley's work is more ambitious and learned than anything that Cavendish produced, but this proximity suggests that Hooke regarded these vernacular publications as similarly engaging in a literary-historical approach to philosophical knowledge. Yet Cavendish took a more critical angle on experimental philosophy than Stanley's history. Focusing her critique on Hooke, Cavendish conceived of experimentation and microscopy as inextricable.⁶⁸² Not only making observations upon various philosophies, she drew on Stanley's text to distinguish between ancient and modern approaches to natural philosophy and their respective relations to "observation" itself. Against the post-Baconian mode of decontextualised natural history that the Royal Society's apologists advocated, I demonstrate that Cavendish manipulated Stanley's capacious and impartial *History* to reinvigorate a more holistic approach to experience and evidence.

⁶⁸¹ See Poole, Henderson, and Nasifoglu. *Bibliotheca Hookiana*. Web. 2015-16.

⁶⁸² In addition to the works cited above, see the studies of Cavendish and Hooke in relation to reading and writing: Spiller, *Science, Reading, and Renaissance Literature: The Art of Making Knowledge, 1580-1670* (2004), 137-77 and Campbell, *Wonder & Science*, 181-220.

The second part of this chapter shifts from Cavendish's historical discussion in *Observations* to the piece of prose fiction that she appended to her 1666 edition, *The Blazing World*. While the last chapter studied Cavendish's satirisation of More in this work, what follows shows that *The Blazing World* is primarily an early example of satirical engagement with experimental philosophy and its newfound institution, the Royal Society.⁶⁸³ It is this feature of Cavendish's "true Blazing World" (as Shadwell refers to in the conclusion of his elegy to her) that inspired his 1676 play, *The Virtuoso*.⁶⁸⁴ But we will see that the temporal distance between the appearance of tracts by the Royal Society's apologists and Shadwell's composition of *The Virtuoso*—along with his status as a dramatist and courtier poet rather than a philosopher—left him to take a strong polemical tone against the Royal Society. By contrast, Cavendish published *Observations* the year after Hooke's best-selling *Micrographia* appeared, and sought to cultivate the status of a "natural philosopher" from the early 1650s onwards. Taking Stanley as a model of the amateur poet-scholar and patron, Cavendish's critique of the Royal Society was driven by the more constructive aim of preserving the bonds that had existed in ancient Greece and in the Republic of Letters between speculative natural philosophy and the literary genres of poetry and drama. Yet, in her attempt to salvage a social basis for the exchange of ideas, Cavendish found herself trapped between the intellectual orbits of two institutions: the Royal Society and the University of Oxford.

4.1. Natural History and the History of Philosophy: Robert Hooke and Thomas Stanley

⁶⁸³ On *The Blazing World* as a work of satire, see Hutton, "Science and Satire: The Lucianic Voice of Margaret Cavendish's *Description of a New World, Called the Blazing World*" (2003).

⁶⁸⁴ *Letters and Poems*, 168.

Working her way through Stanley's *History*, Cavendish stopped to dwell on the Greek philosophers and sects that had most influenced the development of her thought and that of her contemporaries.⁶⁸⁵ Her decision to engage with Plato, Pythagoras, Epicurus, Aristotle, and the Sceptics is unremarkable. But why Cavendish decided to follow Stanley in commencing the section of *Observations* on the ancients with a discussion of "the Principles of Thales" is less obvious. Other than Pythagoras—whom we have seen in previous chapters was a significant source for many early modern thinkers—Thales is the only "pre-Socratic" whose ideas she examines. Partly because none of his writing survived, Thales was infrequently discussed during the seventeenth century. But Cavendish's reading of Stanley led her to realise that Thales was the "first that made disquisitions upon nature, and so the first natural philosopher".⁶⁸⁶ He was one of the six Grecian "wise men", and, in his case, it was not only because he acted according to "morall rules and practises" but also due to his "speculative Learning".⁶⁸⁷ It is the speculative nature of Thales' thought that caught Cavendish's attention.

Of pertinence here is the distinction between experimental and speculative natural philosophy that emerged over the course of the 1660s.⁶⁸⁸ In the broadest sense, speculative natural philosophy sought to explain natural phenomena without prior recourse to systematic observation or experiments. Experimental philosophy, by contrast, began by collecting information about natural phenomena, and only subsequently derived

⁶⁸⁵ Most work on Stanley's *History of Philosophy* has focused on his discussion of scepticism and atomism: see Schmitt, "The Development of the Historiography of Scepticism: From the Renaissance to Brucker" (1987); Blackwell, "Diogenes Laertius's *Life of Pyrrho* and the Interpretation of Ancient Scepticism in the History of Philosophy: Stanley through Brucker to Tennemann" (1993); Fleischmann, *Lucretius and English Literature, 1680-1740* (1964), 95-103; and Kroll, *The Material World*, 152-6.

⁶⁸⁶ *Observations*, 250.

⁶⁸⁷ *History of Philosophy*, Vol. I, Part I, 5-6.

⁶⁸⁸ See Anstey, "Experimental versus Speculative Natural Philosophy". For some correctives that will be important to what follows, see Feingold, "'Experimental Philosophy'" and Levitin, *Ancient Wisdom*, 327-8.

conclusions from this data. Quoting from the preface to Hooke's *Micrographia*, Cavendish calls attention to this distinction between "the real, the mechanical, the experimental philosophy" and "the philosophy of discourse and disputation" that "chiefly aims at the subtlety of its deductions and conclusions, without much regard to the first groundwork, which ought to be well laid on the sense and memory".⁶⁸⁹ Engaging with Hooke, Cavendish structures *Observations* in terms of "Experimental Philosophy", "Contemplative Philosophy", and "Ancient Philosophy". Despite forming separate sections for speculative and ancient philosophy, she nevertheless begins the section on contemplative philosophy by stating that "Ancient Learning Ought Not to be Exploded, nor the Experimental part of Philosophy Preferred Before the Speculative".⁶⁹⁰ Whereas many thinkers affiliated with the Royal Society juxtaposed experimentation and speculation (or contemplation) to proclaim their superiority over the ancients, Cavendish implemented this division to elevate and defend the tradition of speculative natural philosophy that commenced with Thales.

While Cavendish recognised Thales as the first speculative natural philosopher, previous chapters have indicated that Aristotle was the ancient who most came under the siege for overindulging in hypothetical and untestable speculations.⁶⁹¹ More strongly, speculative and Aristotelian natural philosophy were contrasted with experimentation almost interchangeably.⁶⁹² In his *Experimental Philosophy, in Three-Books*, for instance, Henry Power chides those who "stiffly wrangled out a vexatious dispute of some odd

⁶⁸⁹ *Observations*, 49 and Hooke, *Micrographia, Or, Some Physiological Descriptions of Minute Bodies Made by Magnifying Glasses* (London, 1665), A2r.

⁶⁹⁰ *Observations*, 195.

⁶⁹¹ On this point, see Grant, "Ways to Interpret the Terms 'Aristotelian' and 'Aristotelianism' in Medieval and Renaissance Natural Philosophy" (1987).

⁶⁹² See Feingold, "'Experimental Philosophy'", 19.

Peripatetick qualities”, instead of placing their trust in “solid and Experimental Philosophy”.⁶⁹³ Cavendish thus notes in *Observations* that in “this present age those are thought the greatest wits that rail most against the ancient philosophers, especially Aristotle, who is beaten by all”. She proceeds to write that whether Aristotle “deserves such punishment, others may judge. In my opinion, he was a very subtle philosopher, and an ingenious man”.⁶⁹⁴ As we will see more fully over the course of this chapter, Cavendish had good reason to defend Aristotle, since she was a rare figure in Restoration England who used traditional natural philosophy to challenge experimentation.

Throughout *Observations*, she reiterates that “Experimental and Mechanick Philosophy cannot be above the Speculative part, by reason most Experiments have their rise from the Speculative, so that the Artist or Mechanick is but a servant to the Student”.⁶⁹⁵ In the first instance, Cavendish is making a point about methodology and the hierarchy of disciplines, aligning speculation with the university educated “student”, trained in Aristotelian philosophy. Whereas experimental philosophy only generates facts that still require interpretation, speculation is the more perfect and noble enterprise of explaining what is probable or generally true through the appeal to the universal causal power of substances. Yet, given the association between speculative natural philosophy and the ancients, her claim that “most Experiments have their rise from the Speculative” has wider historical import. We have seen in previous chapters that Cavendish denied the possibility of fundamental breaks in history, which means that her contemporaries must have relied heavily on their ancient predecessors (including Aristotle), notwithstanding their derision and avowals of novelty. What is more, by pointing to Thales as a

⁶⁹³ Power, *Experimental Philosophy, in Three-Books* (London, 1664), 184-5.

⁶⁹⁴ *Observations*, 195.

⁶⁹⁵ *Observations*, 7.

speculative thinker at the beginning of her discussion of the ancients, Cavendish suggests that speculative natural philosophy did not initially emerge with the Scholastics or even with Aristotle. Rather, natural philosophy as such has its origins in speculative learning, and, in this respect, Cavendish held that the moderns should follow the ancients. By framing her philosophical predilection as a historical argument, Cavendish subtly reassessed the prioritisation of experimentation among her contemporaries, diverting blame from Aristotle and defending her intellectual orientation.

In arguing for the primacy of speculation, Cavendish's professed target is Hooke's assertion that natural philosophy must "*begin* with the Hands and Eyes, and to *proceed* on through the Memory, to be *continued* by the Reason".⁶⁹⁶ After quoting from the introduction to Hooke's *Micrographia*, Cavendish states that "they confess" such an opinion. Although the Royal Society was by no means a uniform body—with Stanley himself becoming an FRS in 1661—Cavendish felt justified in associating a set of intellectual and "methodological" inclinations with it. Among these, she included an opposition to Aristotelian-Scholastic philosophy, the promotion of under-theorised experimentation, and an engagement in unsystematic fact collection.⁶⁹⁷ Cavendish especially saw these promoted by two of her scholarly interlocutors: Charleton and Glanvill.⁶⁹⁸ We saw Charleton's anti-Aristotelianism in the last chapter, and, in a letter to Cavendish, he wrote that "the Royal Society itself (the grand Tribunal of Philosophical doctrines) is likewise of a constitution exceedingly strict & rigid in the examination of

⁶⁹⁶ *Micrographia*, B2r.

⁶⁹⁷ On the lack of a unified Royal Society "ideology", see Wood, "Methodology and Apologetics: Thomas Sprat's *History of the Royal Society*" (1980); Hoppen, "The Nature of the Early Royal Society" (1976); Skinner, "Thomas Hobbes and the Nature of the Early Royal Society" (1969); Malcolm, *Aspects of Hobbes*, 317-35; and Hunter, *Establishing the New Science: The Experience of the Early Royal Society* (1989), especially 45-72 and 185-244.

⁶⁹⁸ *Observations*, 48.

Theories concerning Nature; no respecter of persons or great Names”.⁶⁹⁹ In one of his epistles to Cavendish, Glanvill similarly referred to the Society as a cadre that de-emphasised theoretical frameworks, claiming that

to make *Hypotheses*, must, I think, be the happy privilege of succeeding Ages; when they shall have gained a larger account of the *Phoenomena*, which yet are too scant and defective to raise Theories upon: so that to be ingenious and confess freely, we have yet no such thing as Natural Philosophy; Natural History is all we can pretend to; and that too, as yet, is but in its Rudiments, the advance of it your *Grace* knows is the design and business of the *Royal Society*.⁷⁰⁰

While his most forceful pro-Society treatise (*Plus Ultra: Or, the Progress and Advancement of Knowledge Since the Days of Aristotle*) did not appear until 1668, Cavendish quotes from and paraphrases Glanvill’s 1665 *Scepsis scientifica* numerous times in *Observations*.⁷⁰¹ As we saw in the last chapter, Cavendish criticised Glanvill’s dogmatism regarding non-fundamental tenets of faith. Given that his theology and natural philosophy were interlinked, Glanvill’s belief that the Royal Society should eschew hypotheses about the natural world would have only served to strengthen Cavendish’s conviction that such “methodological” goals were neither possible nor desirable. In practice, Hooke himself was no stranger to hypotheses, but this is not always apparent in the preface to *Micrographia*.⁷⁰² As the title page betrays, *Micrographia* was commissioned by the president of the Royal Society, William Brouncker, and served as a methodological guide for “the Council of the ROYAL SOCIETY of *London* for Improving of Natural Knowledge”. Reading Hooke’s work alongside that of Charleton and Glanvill, Cavendish did not always interpret it in the most sympathetic light.

⁶⁹⁹ MS Smith 13, ff. 48v. Also see *Letters and Poems*, 111.

⁷⁰⁰ *Letters and Poems*, 124-5.

⁷⁰¹ See *Observations*, 244, 263, 267, and 271. For another early opposition to Glanvill’s apology, see Steneck, “‘The Ballad of Robert Crosse and Joseph Glanvill’ and the Background to *Plus Ultra*” (1981).

⁷⁰² On Hooke’s use of hypotheses, see Hesse, “Hooke’s Philosophical Algebra” (1966); Oldroyd, “Robert Hooke’s Methodology of Science as Exemplified by his ‘Discourse of Earthquakes’” (1972); and Mulligan, “Robert Hooke and Certain Knowledge” (1992).

Despite aligning speculation with the ancients and experimentation with the Society's apologists, Cavendish's belief in historical continuity led her to locate precedence for such fact collection in Pliny's *Natural History*. Targeting the discourse of Plinian wonders with less equivocation than was the case in *Poems, and Fancies*, Cavendish explains that she is "not of Pliny's opinion, 'that nature in her whole power is never more wholly seen, than in her smallest works': For, how can nature be seen in a part, whenas infinite cannot be known neither in nor by any part, much less a small part?"⁷⁰³ In opposing the notion that minute particulars contain the totality of natural knowledge, Cavendish was working from an Aristotelian understanding of "experience". Just as Aristotle considered natural philosophy to be the search for causes that could supply universal or generally true explanations, he held that experience was what occurred most of the time. It was only over the course of the 1660s, among figures in the Royal Society, that experience came to signify a precise observation at a given place and point in time among named persons.⁷⁰⁴ Because of this definitional shift, Glanvill could claim that Aristotle's books on animals did not transcend "vulgar observations" used "to suffrage" previously formulated hypotheses.⁷⁰⁵

Deploying the Aristotelian idea of fixed kinds, Cavendish did not believe in "any want or decay of general kinds of Creatures, but onely a change of their particulars".⁷⁰⁶ For Cavendish, the only point in observing individual aberrations was to better ascertain the nature of a species. She deemed Pliny's wondrous creatures to be formed "when the

⁷⁰³ *Observations*, 200.

⁷⁰⁴ The most important study of early modern "experience" remains Dear, *Discipline and Experience: The Mathematical Way in the Scientific Revolution* (1995). Also see Schmitt, "Experience and Experiment: A Comparison of Zabarella's View with Galileo's in *De Motu*" (1969) and Deleule, "Experientia-experimentum ou le mythe due culte de l'expérience chez Francis Bacon" (1984).

⁷⁰⁵ See Glanvill, *The Vanity of Dogmatizing* (London, 1661), 179 and *Scepsis Scientifica* (London, 1665), 131-2.

⁷⁰⁶ *Observations*, 147.

figurative motions in particular productions do not move after this ordinary way, as in the productions of monsters, it is called a preternatural or irregular production”.⁷⁰⁷ As is suggested by the Latin term *praeternaturalis*—that which is beyond the normal course of nature—Cavendish regarded a focus on the phenomenal to menace the very framework that allowed for natural investigations.⁷⁰⁸ According to the conventional Aristotelian distinction, natural philosophers provide causal explanations, while historians compile a repository of particulars.⁷⁰⁹ In this sense, experimentalists were not natural philosophers at all, but historians who took their object of study as the natural world.

Whereas Cavendish’s historically-sensitive reading of natural history led her back to Pliny, the experimentalists shaped their intellectual predecessor as their countryman, Francis Bacon. In doing so, much was laid by passages such as the one from *Sylva Sylvarum* in which Bacon refers to the putative role that an “indigested heap of particulars” or the “vast wood of experience” might play in natural history. This phrase was, however, used in the preface to Bacon’s work by his former chaplain, William Rawley, who goes on to write that “one great reason why he would not put these particulars into any exact method (though he that looketh attentively into them shall find that they have a secret order) was because he conceived that other men would not think that they could do the like”.⁷¹⁰ While many post-Baconians ironically extracted Rawley’s phrases from their context and universalised to form a “methodological” imperative, Bacon in fact sought to keep his order loose enough that future generations could more

⁷⁰⁷ *Observations*, 198. On early modern monsters, see Daston and Park, *Wonders and the Order of Nature*, 173-214.

⁷⁰⁸ See *OED*, “Preternatural”, adj., 1a. Also see Maclean, *Learned Medicine*, 259-72 and Daston, “Preternatural Philosophy” (2000).

⁷⁰⁹ See Aristotle, *Poetics*, 145b1-7 and *Parts of Animals*, 638a13-640a10.

⁷¹⁰ See Bacon, *Sylva Sylvarum, Works*, Vol. II, ed. by Spedding, Ellis and Heath, (London, 1857-1874), 335-7.

methodically manipulate his findings. Yet, reading Bacon through the lens of later figures, contemporary scholars have often seen him as the father of a new experimental and fact-based natural philosophy.⁷¹¹

But we saw in 1.1 that Cavendish believed Bacon's works had "proved like as some sorts of Meats, which through Time, or mixture of some Flatuous, or Humid Substance, Corrupt, and Breed Magots or Worms".⁷¹² For her part, Cavendish conceived of Bacon's approach to natural history to have far more rapport with Aristotle.⁷¹³ Bacon consistently argued that "natural history" could discuss both monsters and species, but "mostly (as has been said) it deals with species".⁷¹⁴ More strongly, he proceeds to lament that "in naturall Historie, wee see there hath not beene that choise and iudgement vsed, as ought to haue beene, as may appeare in the writings of *Plinius*, *Cardanus*, *Albertus*, and diuers of the Arabians, being fraught with much fabulous matter, a great part, not onely vntryed, but notoriously vntrue".⁷¹⁵ Instead of defending experimentation and collection as the first stages of knowledge acquisition, Bacon maintained that mere accumulation without recourse to judgment was at the root of many fabulous opinions. For Bacon,

⁷¹¹ For just a few recent examples of studies that have followed the post-Baconians in seeing Bacon as a proponent of undigested fact collection, see Jalobeanu, *The Art of Experimental Natural History: Francis Bacon in Context* (2015); Zagorin, "Francis Bacon's Objectivity and the Idols of the Mind" (2001); and Daston, "Baconian Facts, Academic Civility, and the Prehistory of Objectivity" (1991). For a historical explanation of this misinterpretation, see Giglioni, "How Bacon Became Baconian" (2012).

⁷¹² *Sociable Letters*, 146.

⁷¹³ On the Aristotelian aspect of Bacon's thought, see Larson, "The Aristotelianism of Bacon's *Novum Organum*" (1962); Kosman, "The Aristotelian Background of Bacon's *Novum Organum*" (1964); Sgarbi, *The Aristotelian Tradition and the Rise of British Empiricism: Logic and Epistemology in the British Isles (1570-1689)* (2013), 67-79; Lewis, "A Kind of Sagacity: Francis Bacon, the *Ars Memoriae* and the Pursuit of Natural Knowledge" (2009); Murphy, "'Aves quaedam Macedonicae': Misreading Aristotle in Francis Bacon, Robert Burton, Thomas Browne, and Thomas Traherne" (2009), 41-82; and Maclean, "White Crows, Graying Hair, and Eyelashes: Problems for Natural Historians in the Reception of Aristotelian Logic and Biology from Pomponazzi to Bacon" (2005).

⁷¹⁴ *OFB*, Vol. 6: *Philosophical Studies*, 101.

⁷¹⁵ *OFB*, Vol. 4: *The Advancement of Learning*, 26. On Bacon's natural history, see Findlen "Francis Bacon and the Reform of Natural History in the Seventeenth Century" (1997) and Yeo, "Between Memory and Paperbooks: Baconianism and Natural History in Seventeenth-Century England" (2007).

“*historia*” was precisely the well-ordered gathering of data from both history and the senses. Being chiefly concerned with wonders and curiosities, Cavendish argued that the natural historian’s study of particulars was not truly derived from Bacon but rather Pliny and the Renaissance Platonists whose mythology and natural philosophy he challenged.⁷¹⁶

In his sophisticated classificatory scheme from the *Advancement of Learning*, Bacon split natural philosophy into speculative and operative sciences. He subsequently subdivided the speculative part into physics, metaphysics, and natural history, while he determined the operative to consist of the experimental, philosophical, and magical.⁷¹⁷ By making natural history virtually constitutive of experimental philosophy, many figures in the early Royal Society overturned its alignment with speculation. It is true that Bacon sometimes connected natural history with the prime matter that is necessary for a firm philosophical foundation, but we have seen that Bacon stressed the configurations, appetites, and motions of matter. Even such an association consequently attests to the formative impact of speculation and interpretation in the process of understanding qualitative substances.⁷¹⁸

Going a step further than Bacon, Cavendish considered the natural world to be composed of rational and sensitive matter, and, for this reason, she repeats throughout *Observations* that natural philosophy should be “grounded upon regular sense and

⁷¹⁶ On early modern curiosity and natural philosophy, see the essays in *Curiosity and Wonder from the Renaissance to the Enlightenment*, ed. by Evans and Marr; Kenny, *The Uses of Curiosity in Early Modern France and Germany* (2004), especially 160-306; and Harrison, “Curiosity, Forbidden Knowledge, and the Reformation of Natural Philosophy in Early Modern England” (2001).

⁷¹⁷ *OFB*, Vol. 4: *The Advancement of Learning*, 87-8.

⁷¹⁸ See Anstey, “Francis Bacon and the Classification of Natural History” (2012). For Hobbes’s similar attempt to save Bacon from the Baconians, see Lewis, “Francis Bacon and Ingenuity”, 28-30.

reason”.⁷¹⁹ Where Bacon strays from Aristotle by foregrounding the hidden qualities of substances that required interpretation, Cavendish deemed matter itself to dictate the central place of the senses in studying the natural world. She postulated a kinship between rational and sensitive matter in her previous works, but in *Observations* she explicitly conjoins “sensitive perception” and “rational perception”.⁷²⁰ Since vital perceptivity weds sensation and reason, one of these cannot take absolute priority in studying the natural world. Rather than shaping speculation as inimical to observation, it was out of a desire to re-affirm the validity of sensory data that Cavendish shifted the substance theory that grounded her methodology.

In arguing that perceptivity binds sensation and reason, Cavendish moves even closer to Glisson’s view that “perception” is primarily a vital activity that coordinates the material continuum and only a cognitive function secondarily.⁷²¹ So as to clarify that matter’s vital perceptivity is distinct from human perception, Cavendish writes that “animal, at least, human perception, performed by the sensitive and rational motions in the organs appropriated for it, is made by patterning or framing of figures, according to the patterns of exterior objects”.⁷²² While observation supplies humans with accurate likenesses of external phenomena, these are effects that material sensitive perceptions in, say, the eyes, have replicated.⁷²³ In this sense, Cavendish is working with the Aristotelian notion that observations supply images of things that the rational soul turns into ideas that

⁷¹⁹ *Observations*, 16.

⁷²⁰ For Cavendish’s discussion of perception in *Philosophical Letters*, see Clucas, “‘A double Perception in All Creatures’: Margaret Cavendish’s *Philosophical Letters* and Seventeenth-Century Natural Philosophy” (2014).

⁷²¹ See Giglioni, “Francis Glisson’s Notion of *Confœderatio Naturæ*”, 241.

⁷²² *Observations*, 169.

⁷²³ *Observations*, 141.

can be arranged using language.⁷²⁴ Yet we have seen in previous chapters that Cavendish replaced Aristotle's tripartite soul with the qualities of matter itself. By endowing matter with perception, she endeavoured to elude a problem in Aristotle's so-called theory of hylomorphism, or substantial forms.⁷²⁵ According to Aristotle, matter and form are virtually indistinguishable in any particular being, but form can be divorced from matter in the creation of images in the human soul after a perceptive act.⁷²⁶ Detecting a conceptual slip in this discourse, Cavendish reiterates in her discussion of Aristotle's philosophy that "matter and forms are but one thing".⁷²⁷ For Cavendish, the perceptivity of matter created a fluid relationship between external material objects, the images that humans acquire, and the rationality that allows for their arrangement. In doing so, she homed in on the material plurality of perceptive *minima* rather than the duality of matter and form.

Challenging Aristotle's more anthropocentric notion of plain-sight observation, Cavendish accounted for perceptual relativity by maintaining that all matter is perceptive and sits on a continuum. If the perception of matter is unconscious and only emerges as conscious sensation through the mediation of animal organs, then the perceptive acts of each species (and even individual animals) will differ with bodily compositions. As Cavendish puts it, "though a piece of wood, stone, or metal, may have a perceptive knowledge of man, yet it hath not a man's perception; because it is a vegetable, or mineral, and cannot have an animal knowledge or perception, no more than the eye

⁷²⁴ For a more thorough account of the Aristotelian-Scholastic approach to perception and epistemology, see Spruit, *Species Intelligibilis: From Perception to Knowledge* (1994), especially Vol. 1, 36-48. Also see Everson, *Aristotle on Perception* (1997) and Modrak, *Aristotle: The Power of Perception* (1987).

⁷²⁵ On hylomorphism, see Lüthy and Newman, "'Matter' and 'Form': By Way of a Preface" (1997) and Pasnau, "Form and Matter" (1980).

⁷²⁶ See Manning, *Matter and Form in Early Modern Science and Philosophy* (2012), especially chapters 1 and 2 and Gill, *Aristotle on Substance*, especially 111-38.

⁷²⁷ *Observations*, 270.

patterning out a tree or stone, can be said to have a vegetable or mineral perception”.⁷²⁸ In previous works, her postulation of sensitive and rational matter periodically veered her towards anthropomorphism, but she can now forward a theory of sensitive and rational perceptivity without attributing reason and sensation to all figures.

Cavendish’s ideas on perception enable us to better appreciate her critique of Hooke’s use of optical instruments. Arguing against Hooke’s position that optical devices could “recover some degree of those former perfections” that Adam and Eve once possessed, Cavendish held that microscopes add something of their own natures to beget qualitative changes in the objects that they are used to observe.⁷²⁹ It is not so much that optical apparatuses supply less “true” images in an anthropomorphic sense, but rather that they can tell us very little about the natural world as humans usually observe and comprehend it. For this reason, humans may as well be of a different species when they look at an object through a microscope. Even worse, whereas other animals possess natural organs, optical instruments mix natural and artificial perceptivity. Using a distinction from Aristotle’s *Physics*, Cavendish writes that “by the word *Natural*, I understand the particular nature of some certain figure or Creature; and when such a figure has some other exterior motions besides those which are proper to its particular nature, caused by Art, I call them artificial”.⁷³⁰ Instead of assisting with the placement of aberrations, optical arts turn the natural into preternatural or “superficial wonders”.⁷³¹ As Cavendish points out, “if the picture of a young beautiful lady should be drawn according

⁷²⁸ *Observations*, 141.

⁷²⁹ *Micrographia*, A1r.

⁷³⁰ *Observations* (1666), “An Explanation of Some Obscure and Doubtful Passages Occurring in the Philosophical World, hitherto published by the Authoress”, 53. See Broadie, *Nature, Change, and Agency in Aristotle’s Physics: A Philosophical Study* (1982), especially 50-74. Cf. Newman, “Art, Nature, and Experiment Among Some Aristotelian Alchemists” (1997).

⁷³¹ *Observations*, 51.

to the representation of the microscope”, the portrait would “not be like a human face, but rather a monster”.⁷³² In addition to forming wondrous images, microscopes are superficial in the sense that they are incapable of elucidating the essence of matter. Because of this, rational speculations on matter must precede systematic observation if one is to arrive at an accurate picture of the natural world.

As this implies, Cavendish associated sensitive matter with plain-sight observation.⁷³³ Not only is this due to her notion of vital perceptivity, but it is also in keeping with the tradition of *minima naturalia*. Despite the fact that optical instruments were incapable of detecting atoms, microscopes were congenial to the insight that there was a whole world beyond direct observation. By contrast, the theory of *minima naturalia* did not posit a sharp break between the observable realm and a material sub-structure, which meant that there was no reason to believe that observations at a micro level would supply any information beyond that which was normally observed. Indeed, while a theoretical model of perception underpinned her critique of optical apparatuses, she repeatedly appeals to what is “known by experience” in her critique of the experimentalists. Playing on the term “multiplying-glass”—which is both synonymous with “magnifying glass” and a toy that is made of concave lenses—Cavendish asks her reader to “see how multiplying glasses do present numerous pictures of one object, which he that has not the experience of the deceitfulness of such glasses, would really think to be so many objects. The like deceits may be in other optic instruments, for ought man

⁷³² *Observations*, 51. On optical instruments and the early Royal Society, see Wilson, *The Invisible World: Early Modern Philosophy and the Invention of the Microscope* (1995); Fournier, *The Fabric of Life: Microscopy in the Seventeenth Century* (1996); Malet, “Early Conceptualizations of the Telescope as an Optical Instrument” (2005); and Ford, “The Royal Society and the Microscope” (2001).

⁷³³ *Observations*, 57, 83, 134, and 243.

knows”.⁷³⁴ Having owned her fair share of optical devices, Cavendish observed bodies under microscopes not to disclose their “real” natures, but to compare her observations so as to apprehend how they function.⁷³⁵ This is an activity that Charles Cavendish undertook more systematically during an earlier period.⁷³⁶ Highlighting her elevation of experience over experimentation, Cavendish argued that experiments often create self-enclosed systems while experience can uncover flawed assumptions and technological deficiencies. With this in mind, she believed that mechanical apparatuses could serve as the external equivalent to Descartes’ ahistorical and decontextualised *cogito*.

In a section of *De generatione animalium* titled “Of the Manner and Order of Attaining Knowledge”, Harvey expounds a method or logic for proceeding in natural philosophy that closely resembles Cavendish’s. He states that “though *Universals* are chiefly known to us (for Science is begot by reasoning from *Universals* to *Particulars*) yet that very comprehension of *Universals* in the *Understanding*, springs from the perception of *Singulars* in our *sense*”.⁷³⁷ In doing so, Harvey attempts to reconcile the claim in Aristotle’s *Physics* that philosophy must proceed from universals to singulars with his declaration in the *Analytics* that singulars, being derived from the sense, are most immediately known. While humans may directly observe natural particulars, the human mind abstracts from these and fits them into a wider context because sense itself is a

⁷³⁴ *Observations*, 135. See *OED*, “Multiplying-Glass”, n. 1 and 2.

⁷³⁵ On the optical instruments that the Cavendishes owned, see *John Pell and His Correspondence*, 502-4. Also see the letters from William Cavendish to Thomas Hobbes about his optical instruments in NUL, MS Pw 1/406 and the letter from Humfrey Poole to Andrew Clayton in NUL, MS Pw 1/484. These have now been published in Malcolm and Tolonen, “The Correspondence of Thomas Hobbes: Some New Items” (2008). From these letters, it is clear that William left Hobbes his optical instruments in 1648, and agreed that Hobbes could keep them in 1661, in lieu of a debt that William owed him. This episode suggests that while the Cavendishes were interested in astronomy and optics on the continent, William and Margaret became increasingly disinterested in these subjects after Charles’ death.

⁷³⁶ See Charles Cavendish’s in-depth comparison of various perspective glasses in Harley MS 6083r-v. More generally, see Spiller, “Reading through Galileo’s Telescope: Margaret Cavendish and the Experience of Reading” (2000).

⁷³⁷ *Anatomical Exercitations, Concerning the Generation of Living Creatures*, 467, A5r and A7v-r.

universal.⁷³⁸ Cavendish's belief that matter is endowed with rational and sensitive perceptivity also leads her to believe that "there's nothing which is not subject, or has a participation of this universal sense in nature, as well as of reason".⁷³⁹ By imputing perceptivity to matter, Cavendish makes sense both a source of knowledge and a cause in the Aristotelian sense. Sensitivity exists as a universal prior to any particular human act of sense perception, but the process of reasoning requires an individual to apply this universal sense in a conscious perceptive act. In contrast to Hooke's and Glanvill's suggestions of a sharp historical break, thinkers in the Royal College of Physicians (and especially Harvey) developed a more nuanced outlook on natural philosophical methodology by paying close attention to its history, and especially their Aristotelian inheritance. Making this association explicit in *Observations*, she writes that "wise physicians and surgeons know by experience, as well as by learning and reason, what is best for their patients in all kind of distempers".⁷⁴⁰ Here Cavendish applauds the "experience" along with the "learning and reason" of physicians, in contradistinction from the fact collection, closed experimentation, and implementation of optical instruments among figures in the Royal Society.

It is one of the great ironies of seventeenth-century thought that Gassendi's deeply historical work fuelled not only the anti-Aristotelian rhetoric of the Royal Society's apologists, but also their exaggeration of the discontinuities between their undertakings and those of the ancients.⁷⁴¹ Approaching Gassendi with a different motive, Stanley states

⁷³⁸ On this point, see Wear, "William Harvey and the 'Way of the Anatomists'".

⁷³⁹ *Observations*, 257.

⁷⁴⁰ *Observations*, 243.

⁷⁴¹ On the historical aspect of Gassendi's anti-Aristotelianism, see Joy, *Gassendi, the Atomist*, especially 25-40; Brundell, *Pierre Gassendi*, 15-50; and Osler, "Ancients, Moderns and the History of Philosophy: Gassendi's Epicurean Project" (1993).

in the dedication to his uncle, John Marshall, at the beginning of his *History of Philosophy* that

The learned *Gassendus* was my precedent; whom nevertheless I have not followed in his partiality: For he, though limited to a single person, yet giveth himselfe liberty of enlargement, and taketh occasion from his subject to make the world acquainted with many excellent disquisitions of his owne. Our scope being of a greater latitude, affords lesse opportunity to favour any particular.⁷⁴²

That Gassendi exerted a profound influence on Stanley can also be inferred from the fact that the section of his *History* on Epicurus is largely an English translation of Gassendi's *Philosophiae Epicuri syntagma* (an appendix to his *Animadversiones*).⁷⁴³ As we saw in the first chapter—and Stanley ventures here—Gassendi applied his philological training to “enlarge” and rehabilitate Epicurean atomism for a Christian readership. Cavendish's history of philosophy in *Observations* brings her back around to a Gassendian influence, but now concerning a historical focus rather than her substance theory. Yet, among other reasons, Cavendish appreciated Stanley's *History* because it provides an inclusive, vernacular presentation of ancient ideas. In *Animadversiones*, Gassendi translated Book X of Diogenes's *Lives of Eminent Philosophers*, but Stanley's *History* is a loose translation of his whole work, in which details are contested and material added when necessary. Stanley's contextualisation of many ancient thinkers in his *History* concords with Cavendish's notion that there should neither be an emphasis on mere particulars nor a swift movement from singulars to a universal, but that each particular should be viewed within its appropriate setting.

⁷⁴² *History of Philosophy*, Book I, A1r. The most thorough studies of Stanley's *History of Philosophy* are Malusa, “Thomas Stanley's History of Philosophy” (1993); Levitin, *Ancient Wisdom*, 54-83; and Haugen, *Richard Bentley: Poetry and Enlightenment*, 18-29.

⁷⁴³ This was mistaken for Gassendi's larger *Syntagma Philosophicum* of 1658 in Kroll, “The Question of Locke's Relation to Gassendi” (1984).

We saw in 1.2 that Gassendi's eclecticism was commonplace during the mid-seventeenth century, rather than a distinct philosophical method. In her later writing, Cavendish came to critique such eclecticism as apologetic reconciliation, such as when she writes in *Observations* that some of her contemporaries

altogether follow either Aristotle, Plato, Epicurus, Pythagoras, etc. others make a mixture of several of their opinions; and others again take some of their opinions, and dress them up new with some additions of their own; and what is worst, after all this, instead of thanks, they reward them with scorn, and rail at them; whenas, perhaps, without their pains and industry, our age would hardly have arrived to that knowledge it has done.⁷⁴⁴

Perhaps even more than if he had dogmatically followed Epicurus, Cavendish deemed Gassendi's eclectic philosophy to prompt his anti-Aristotelianism. Since he assimilated ideas from the *corpus aristotelicum* to augment his Epicurean atomism, Gassendi was compelled to fervently repudiate fundamental Aristotelian principles to justify his decision to render Epicurus the new philosopher of the schools. Attuned to the tendency among his peers to appropriate philosophical notions from other thinkers to bolster their opinions or those of their favoured school, Stanley echoes Cavendish when he writes in his preamble that it is not "unseasonable at this time to examine the tenets of old Philosophers, when so great variety of opinions daily spring up; some of which are but raked out of the ruins of antiquity, which ought to be restored to their first owners".⁷⁴⁵ Another reason why Cavendish may have commenced her reflections on the ancients with a discussion of Thales could have been because he was one of those philosophers who did "not alwaies had the fortune to enjoy the just reward, their glory being intercepted oftentimes by some later disguise of alteration or addition".⁷⁴⁶ We saw in 2.2

⁷⁴⁴ *Observations*, 249-50.

⁷⁴⁵ *History of Philosophy*, Vol. I, A3v.

⁷⁴⁶ *History of Philosophy*, Vol. I, Part I, 1.

that Cavendish challenged van Helmont's alleged originality, and, upon reading Stanley's claim that Thales thought "Water is the Principle of all natural things", she is quick to point out that "Helmont doth embrace this opinion, as I have declared in my *Philosophical Letters*, and in the foregoing part of this book, and have given, withal, my reasons why water cannot be a principle of natural things, because it is no more but a natural effect".⁷⁴⁷ With Stanley supplying a clear vernacular explication of ancient opinions, Cavendish sought to clarify that her philosophy was reliant on but not pilfered from past thinkers.

While Cavendish and Stanley both emphasised the diversity of ancient thought, they produced very different works. Stanley's *History* reconstructs the biographical details and philosophical opinions of a plurality of philosophers and their schools. He abandoned direct comparisons in hopes that the organisation of his publication would stimulate the reader's reflections on the relationship between sects. To this end, despite realising that the "philosophy of *Aristotle* is well known", Stanley recounts Aristotle's ideas so that the reader can see how "the doctrine and method of the *Peripateticks* is different from that of the *Academicks* and *Stoicks*".⁷⁴⁸ Cavendish's appreciation of Stanley's history rests in part on his efforts to remain impartial by both refusing to follow Gassendi in supporting one party, and judiciously desisting from discriminating between schools.⁷⁴⁹ What has been described as the "suave and calm style of Stanley's English prose" also contributed to Cavendish's belief in his reliability.⁷⁵⁰ This is not to say that Stanley lacked philosophical opinions or inclinations; on the contrary, his early poetry

⁷⁴⁷ *Observations*, 251.

⁷⁴⁸ *History of Philosophy*, Vol. II, Part VI, 42.

⁷⁴⁹ On early modern impartiality, see the introduction to and essays in *The Emergence of Impartiality*, ed. by Murphy and Traninger (2013).

⁷⁵⁰ Haugen, *Richard Bentley: Poetry and Enlightenment*, 18.

attests to a clear preference for Platonic thought. But Stanley held that history should be disinterested, whereas it was accepted (or even expected) that poetry would express philosophical biases. Due to the care with which Stanley masked prejudices in his history, Cavendish regarded him as a trustworthy authority not only on Plato but also Aristotle and the Peripatetics, as did thinkers of differing persuasions.⁷⁵¹ Although Cavendish disagreed with Glanvill on many theological and philosophical questions, Glanvill also turned to Stanley's *History* as a source for ideas on Plato and the Sceptics.⁷⁵² Instead of following natural historians in their refusal to order particulars, Stanley's impartiality arose from his structural care to chronology, which allowed him to trace intellectual genealogies while evading explicit comparisons.

In contrast to Stanley, Cavendish's natural philosophy is pluralistic precisely because she used her judgment (or partiality) to intermix ancient and occasionally modern ideas. The Cambridge scholar and divine, Ralph Widdrington, recognised this in two copies of the same letter in Latin and English that he sent to Cavendish. Despite bearing the signatures of "The Vice-Chancellor and the rest of the Senate of the University of Cambridge", it is evident two manuscripts in Cambridge that Widdrington penned these letters as part of his duty as public orator, also sending epistles to the likes of Johannes Hevelius, the Earl of Clarendon, and Prince Rupert.⁷⁵³ In any case, after receiving a copy of *Observations*, Widdrington notes that Cavendish enquired

into the Mysteries of every Sect, you most exactly weigh, distinguish, and correct whatsoever *Democritus* laughed at, or *Heraclitus* wept, or *Epicurus* raved, or *Pythagoras* concealed, or *Aristotle* understood, or *Arcesilas* was ignorant of. Nor

⁷⁵¹ On the Platonism of Stanley's early poems, see Revard, "Translation and Imitation of Joannes Secundus' *Basia* during the Era of the Civil War and Protectorate in England: 1640-60" (2000).

⁷⁵² See Cope, *Joseph Glanvill: Anglican Apologist*, 133-39.

⁷⁵³ See Peterhouse Library, GBR/0273/Widdrington. Clean copies of some of these letters have been made in Cambridge University Library, MS Add. 6868.

do you neglect, or omit, in case the *Lord Verulam*, or *Harvey*, or *Des Cartes*, or *Galilaeus* hath pretended to add to the achievements of the Antients”.⁷⁵⁴

While what “*Aristotle* understood” served as the bedrock of Cavendish’s philosophy, she conceived of the process of intermixing as innate to matter itself. Cavendish made a theoretical distinction between “the animate (sensitive and rational) and the inanimate” matter, yet she considered these to be constantly “intermixt together” in practice.⁷⁵⁵

Holding that humans should follow Nature rather than artificially transforming it, Cavendish thought that philosophers could only produce new insights into the natural world through the thorough intermixture of previously expounded ideas. This is another reason why the rational (and textual) engagement with the history of philosophy must have priority over the controlled study of experimentalists and natural historians. Systematic observation may shed fresh light on age-old opinions, but it is through intermixture that eternal matter creates new figures and thoughts. In stark contrast to the Cartesian conception of novelty, Cavendish’s view of “newness” was deeply historical.

To understand Cavendish’s belief that rearranging pre-existing notions can generate new philosophical positions, it will help to return to the distinction between *minima naturalia* and atomism. We saw in chapter 2 that Gassendi deemed atoms to gather in the creation of bodies but to maintain their original qualities in the new conglomerations. Cavendish plainly expresses her opposition to this idea in *Observations* when she writes that atomists envisage bodies to obtain “new qualities, yet still the ingredients retain each their own nature; and in the destruction of the composed body, those that are of one sort, associate and return into fire, water, earth, etc. as they were

⁷⁵⁴ *Letters and Poems*, 30-1.

⁷⁵⁵ *Observations*, “An Explanation of Some Obscure and Doubtful Passages”, 47.

before”.⁷⁵⁶ Here she rehearses the Aristotelian criticism that atoms cannot create real mixtures. By contrast to the atomists, we have seen that Galenists considered each component part of a compound to lose its nature in the process of concoction. At a more fundamental level, the theory of *minima naturalia* means that in pure mixtures elements combine to lose their individual qualities in favour of a new form. Applying this notion to the intermixture of dull, sensitive, and rational matter, she writes that “the actions of self-moving matter are so infinitely various, that, according to the mixture or composition and division of parts, they can produce what figures they please; not by a new creation, but only a change or alteration of their own parts”.⁷⁵⁷ Throughout *Observations*, she repeats that there cannot be an irreducibly original production, while arguing that the infinite variety of arrangements that matter undergoes can give rise to “new” ideas. In this sense, the theory of *minima naturalia* provides a material explanation for the plurality of distinct philosophical positions that can be developed within the traditions of Aristotelian thought. What is more, the notion that amalgamating manifold sources in the creation of a “new” perspective that can only ever be associated with Aristotle indicates the paradoxical nature of self-identifying as an Aristotelian. Seeing Aristotelian thought as fundamentally pluralistic and against slavish adherence to authority, Cavendish followed the “*Nullius in Verba*” that the Royal Society took as its motto. But her interpretation of the notion that philosophers should not follow any particular master greatly deviates from how it was construed and deployed among the Royal Society’s propagandists.⁷⁵⁸

If she hoped to show that reconfiguring old ideas could create new positions, it was necessary for Cavendish to distinguish her philosophy from that of previous thinkers.

⁷⁵⁶ *Observations*, 231.

⁷⁵⁷ *Observations*, 238.

⁷⁵⁸ See Dear, “*Totius in Verba*”.

Since she had largely established her philosophical tenets by 1666, it was in this process that Stanley's *History* proved most useful. Drawing on his work, Cavendish highlights the places that she agrees with and diverges from each thinker. Her process of identifying errors accords with Bacon's desire to compose "Seuerall Glosses and Opinions vpon Nature, wherof it may bee euery one in some one point, hath seene clearer then his fellows".⁷⁵⁹ Stanley in fact quotes from Bacon's *Advancement of Learning* at length in volume three of his *History*, taking his focus on the diligence and judgment required in writing a history of philosophy as a mission statement:

I could wish a collection made, but with diligence and judgement, *De Antiquis Philosophiis*, out of the lives of Ancient Philosophers; out of the Parcels of *Plutarch* of their *Placis*; out of the Citations of *Plato*; out of the Confutations of *Aristotle*; out of a sparsed mention found in other Books as well of Christians, as of Heathens, (as out of *Lactantius*, *Philo*, *Philostratus*, and the rest): *For I do not yet see extant a work of this Nature*.⁷⁶⁰

As outlined in *Advancement*, the history of philosophy was part of the search for encyclopaedic knowledge, and was at least as informative as the direct study of the natural world. In Stanley's *History*, Bacon's understanding of natural history as the collection, description, and rational ordering of natural phenomena meets an intellectual history or *historia literaria* that canvasses the gamut of Greek (and Chaldean) thought so that subsequent thinkers can identify and avoid past errors.⁷⁶¹ Cavendish only further moves the history of philosophy towards the history of ideas by concentrating on Stanley's characterisation of classical thought as such, rather than the individuals who constructed them and the societies out of which they emerged.⁷⁶²

⁷⁵⁹ *OFB*, Vol. 4: *The Advancement of Learning*, 92.

⁷⁶⁰ *History of Philosophy*, Vol. III, A1r-v.

⁷⁶¹ See Ligota and Quantin, "Introduction", *History of Scholarship*, 17-22.

⁷⁶² On the trend towards looking at the history of ideas, see Joy, *Gassendi, the Atomist*, 66-82.

Even as Cavendish identified and sometimes critiqued past errors, she did not treat any ancient philosopher with the scorn that some of her contemporaries heaped onto Aristotle. Despite notably departing from her early Epicurean orientation—and repeatedly voicing her qualms with atomism—she continued to agree “with Epicurus” on numerous points, such as the notion that this world is but “a part of the Universe” and that “there are perpetual changes of particulars” in the natural world.⁷⁶³ On the other hand, she deemed Aristotle “no less exempt from errors, than all the rest”.⁷⁶⁴ Precisely because Cavendish did not self-identify as an Aristotelian, she did not feel obliged to denigrate other philosophical sects. Cavendish’s engagement with Epicurus and Aristotle underscores the importance of temporal shifts in the process of intermixing ideas to form a pluralistic philosophy. Rather than being something to despise, she considered modifications of philosophical perspective to be central to the process of reading, interpreting, and intermixing concepts over time.

As the centrality of textual evidence to their outlooks on the natural world indicates, both Cavendish and Stanley used history to situate natural philosophy within a wider range of literary pursuits. Using scholarship to address philosophical questions without slipping into the Renaissance humanist’s emphasis on eloquence, Stanley was the most literary of his scholarly contemporaries. It is well known that he was the leading figure in a circle of poetic-scholars before the Restoration.⁷⁶⁵ As his 1651 *Poems, and Translations* bear witness, ancient philosophy and the vernacular writing of his

⁷⁶³ *Observations*, 264.

⁷⁶⁴ *Observations*, 267.

⁷⁶⁵ On Stanley’s literary circles, see Revard, “Thomas Stanley and ‘A Register of Friends’” (2000); McDowell, *Poetry and Allegiance in the English Civil Wars: Marvell and the Cause of Wit* (2008), especially 13-69; and Crump, “Introduction”, *The Poems and Translations of Thomas Stanley* (1962), xxi-lxvi.

contemporary continental poets were significant to Stanley from an early period.⁷⁶⁶

Almost certainly aware of his previous literary endeavours, Cavendish upheld Stanley's *History* as a model in part because it balanced literature, philosophy, and erudition in a way that Cavendish understood and even hoped to replicate. Stanley supplies over 100 poems and poetic fragments in his *History*, and offers comic relief at intervals throughout the work. Stanley concludes his discourse on Socrates with a translation from Aristophanes' *The Clouds*, for instance, though he regrets that it is "not as a Comickall divertissement for the Readers, who can expect little in that kind from a subject so antient, and particular".⁷⁶⁷ After burdening his reader with "so serious a Discourse" on Plato's philosophy, he also provides "a Poeticall entertainment upon the same Subject, being A Platonick Discourse, Written in Italian by John Picus Earl of Mirandula, In explanation of a Sonnet by Hieronimo Benivieni", which was initially published in his *Poems, and Translations*.⁷⁶⁸ Despite offering the poem as entertainment, Stanley could not help but provide detailed commentary on each stanza.

But poetry did not only serve as a break from more serious concerns: it also grounded Stanley's understanding of history and served as a source of historical information. Stanley makes this clear in his preface when he writes that there are "two kinds of History; One represents generall affairs of State; The other gives account of particular persons, whose lives have rendred them eminent. *Homer* hath given an essay of each; of the first in his *Iliads*, a relation of a war betwixt different Nations; of the second

⁷⁶⁶ See Wilson and Vincent, "Thomas Stanley's Translations and Borrowings from Spanish and Italian Poems" (1958) and Praz, "Stanley, Sherburne and Ayres as Translators and Imitators of Italian, Spanish and French Poets" (1925).

⁷⁶⁷ *History of Philosophy*, Vol. I, Part III, 67-93.

⁷⁶⁸ *History of Philosophy*, Vol. II, Part V, 94-118.

in the *Odysses*, confined to the person of *Ulysses*".⁷⁶⁹ Just as natural philosophers should fit particular phenomena into a general scaffold, Stanley uses Homer to indicate that the historian's job is to study the relationship between the general and particular. Appealing to Homer as a model for writing history might seem strange, for few seventeenth-century thinkers accredited his narrations with historical accuracy. When there is a dearth of evidence for his historical reconstruction of a particular figure, however, Stanley often presents stories that do not fit directly with his history so as to fill in the environment out of which early Greek (and Chaldean) philosophy emerged.⁷⁷⁰ By doing so, he encourages his reader to use their judgment to decipher between evidence, contributing to the sense that he is impartially placing historical episodes and ideas. In the so-called "Battle of the Books"—which surfaced for a brief moment after the 1690s—history becomes a contested ground, with the "ancients" claiming literature and rhetoric as their own while the "moderns" asserted their superiority in natural philosophy. Yet, even as he composed a history of philosophy that was to supply a backdrop for further philosophical developments, Stanley maintained that the earliest poets could serve as significant sources of historical evidence.

Before clarifying why Stanley used poetry as a source of information in writing his history of philosophy, it will be worthwhile to review the distinction between poetry and natural philosophy from Aristotle's *Poetics*. For Aristotle, poetry must be mimetic and conform to the normative labels of better or worse, whereas natural philosophy should be didactic and pursue truth. This division led Aristotle to pronounce Homer a

⁷⁶⁹ *History of Philosophy*, Book I, A1r.

⁷⁷⁰ See Haugen, *Richard Bentley: Poetry and Enlightenment*, 23-4.

“poet” and Empedocles a “naturalist”, despite the fact that they both wrote in verse.⁷⁷¹

Following a long line of thinkers (including many Aristotelians) who challenged such a clear-cut difference, Stanley points out that Anaxagoras “first affirmed the poesy of *Homer* to consist of virtue and Justice, to which *Metrodorus* added, that the Poet was skilfull in naturall Philosophy”.⁷⁷² Thales may be the first “natural philosopher” because of his explicit mode of speculation, but Stanley surmised that his ideas were gleaned from the poets, firmly rooting speculative natural philosophy in the literary. He considered Thales’s opinion that water was the principles of all things, for example, to have been derived from Homer’s reference to the ocean as the place from “whence all things receive their birth”.⁷⁷³ We saw in 3.1 that Cavendish deemed More’s ideas on Judaic primacy to be romantic tales, but she finds far more historical verisimilitude in Stanley’s view that speculative natural philosophy has its origins in poetry. Cavendish’s chief objection to the historical narratives of figures such as More is that their confusion of theology and natural philosophy threatened to supplant *philosophical* pluralism with the most typical mode of eclecticism, based on the syncretic fusion of heathen philosophy with theology. It was the poetic origin of philosophy that enabled Cavendish to maintain that all ideas came from the intermixture of previously held notions without arbitrarily positing a single Greek philosopher (such as Thales) as the source of all knowledge or advancing some version of *prisca sapientia*.

Despite harbouring reservations about syncretism, Stanley later proposed non-Grecian influences on Greek philosophy in his discussion of the Chaldeans, Persians, and

⁷⁷¹ Aristotle, *Poetics*, 1.47b. See Greene, *The Light in Troy: Imitation and Discovery in Renaissance Poetry* (1982), 1.

⁷⁷² *History of Philosophy*, Vol. I, Part II, 18. See Hathaway, *The Age of Criticism: The Late Renaissance in Italy* (1962), 65-80 and Schuler, *Francis Bacon and Scientific Poetry* (1992), especially 5-6.

⁷⁷³ *History of Philosophy*, Vol. I, Part I, 9.

Sabians in the fourth volume of his history, published in 1662.⁷⁷⁴ While Cavendish almost certainly knew of this book, she chose to ignore it. In doing so, she interestingly remained closer to Diogenes's original work, since this volume of Stanley's history (which seems to have been something of an afterthought) breaks both with his chronological progression and his primary source. As Cavendish was undoubtedly aware, focus on the transmission of ideas from the Near East had a hand in Aristotle's displacement.⁷⁷⁵ Even if Stanley was more discerning, Platonic-Christian syncretists such as Ficino put Zoroaster (the supposed author of the *Chaldean Oracles*) at the beginning and Plato at the end of a line of proto-Christian sages. Despite having been Plato's student, Aristotle was marginalised in such narratives. For this reason, although her delimitation of genres deviates from Aristotle's *Poetics*, Cavendish's emphasis on the emergence of speculative natural philosophy out of poetry allowed her to accept the Aristotelian principle that intermixture can produce a new creation without recourse to the dissemination of ideas from the East. With Stanley's suggestion in the earlier volumes of his *History* that speculative natural philosophy arose out of ancient poetry, Cavendish also discovered an historical basis for the Baconian notion that ancient poetry and mythology provided critical hints for interrogating the fundamental constituents of the natural world, without slipping into Bacon's own idiosyncratic ideas on Eastern transmission.

Mirroring the history of philosophy more generally, Cavendish slowly moved from her more piece-meal or "atomised" ideas to a subtly layered and interlinked philosophical basis with her theory of *minima naturalia*. Her poetic conceits were

⁷⁷⁴ On volume four of Stanley's *History*, see Levitin, *Ancient Wisdom*, 54-70.

⁷⁷⁵ See Mulsow, "Ambiguities in *Prisca Sapientia*" and Blair, "Mosaic Physics in the Search for a Pious Natural Philosophy" (2000).

primitive ideas that she gradually built upon and intermixed with her later views to arrive at more probable explanations for natural causes. With this understanding of intellectual development, Cavendish suggests the Baconian concept that knowledge sprouts from fragments and aphorisms until a stable substance and method are established.⁷⁷⁶ But she resisted the supposition that such truths are more fully contained in the writing of ancient poets or the so-called pre-Socratics because they were closer to a state of prelapsarian perfection. Even so, just as the process of intermixture in the creation of a distinct philosophical position is aided by the traces of the ideas that a thinker previously held, Cavendish believed that remnants of the poetry from which speculative philosophy was derived suffuse the history of philosophy. For this reason, Cavendish (like Stanley) considered the study of poetry and philosophy to be mutually beneficial in apprehending the development of approaches to the natural world.

4.2. Staging Experimentation: Thomas Shadwell and Christ Church

By appending her fictional *Blazing World* to *Observations*, Cavendish was in part following Stanley's incorporation of poetry in his work on the history of philosophy. But she was also using Bacon to critique the post-Baconians by forming a textual parallel with *Sylva Sylvarum* and *The New Atlantis*. Cavendish would have encountered these works in the conjoined 1627 edition, in which Rawley wrote in the preface that this "Worke of the *New Atlantis* (as much as concerneth the *English Edition*) his *Lordship* designed for this Place; In regard it hath so neare Affinity (in one Part of it) with the

⁷⁷⁶ *OFB*, Vol. 4: *The Advancement of Learning*, 30. See Vickers, *Francis Bacon and Renaissance Prose*, 60-95 and Clucas, "'A Knowledge Broken': Francis Bacon's Aphoristic Style and the Crisis of Scholastic and Humanist Knowledge Systems" (1997).

Preceding *Naturall History*”.⁷⁷⁷ We have seen that Cavendish critiqued some of the ways that *Sylva* was manipulated amongst figures in the Royal Society, and by appending her fictional work to *Observations* she is in part responding to their narrow by indicating that Bacon’s vision was entangled with philosophy, fiction, and mythology. Whereas Stanley’s poetic translations further acquainted his reader with the historical landscape and philosophical ideas of ancient Greece and the Near East, Cavendish shaped *The Blazing World* as a critique of experimentation.⁷⁷⁸ In this sense, she updated Bacon’s *historia literaria* to include the errors that befell her contemporaries in their attempts to establish “Salomon’s House”. Since the Royal Society’s propagandists alleged that their approach to the natural world broke with the wider history of philosophy, it was also apt for Cavendish to challenge them on their own terms by shifting her critique from the history of philosophy to the realm of satirical fiction. It is the satirical aspect of her work that piqued the interest of Shadwell, a close friend and patron of the Cavendishes.⁷⁷⁹

As copies of *The Sullen Lovers* and *The Humorists* in the University of Nottingham Library demonstrate, Shadwell was in the habit of presenting William and Margaret with the manuscripts of his plays and asking them for feedback before printing or staging the pieces.⁷⁸⁰ Because Cavendish seems to have expressed a fondness for Shadwell’s 1671 *The Humorists* after reading the manuscript copy, Shadwell dedicated it “To the Most Illustrious Princess Margaret Dutchess of Newcastle”. Intimating his respect for Cavendish’s satirical wit, Shadwell writes in his dedication that the “Play was

⁷⁷⁷ Bacon, *New Atlantis, A Worke Unfinished* (London, 1627), A2r-v. See Colclough, ““The Materialls for the Building’: Reuniting Francis Bacon’s *Sylva Sylvarum* and *New Atlantis*” (2010).

⁷⁷⁸ While focusing on a later period, the best work on satire and natural philosophy remains Levine, *Dr. Woodward’s Shield: History, Science, and Satire in Augustan England* (1977). Also see Syfret, “Some Early Reactions to the Royal Society” (1950) and “Some Early Critics of the Royal Society” (1950).

⁷⁷⁹ The only notable work on Shadwell and the Cavendishes is Love, “Shadwell, Flecknoe and the Duke of Newcastle: An Impetus to MacFlecknoe” (1985).

⁷⁸⁰ See NUL, MS Pw V 33 and MS Pw V 34.

intended as Satyr against *Vice* and *Folly*, and to whom is it more properly to be presented than to your Grace? who are, above all your Sex, so eminent in Wit and Vertue”.⁷⁸¹

Shadwell dedicated his work to Margaret not only to express his literary and monetary debts—with an eye to future aid—but also because he hoped that her noble status would guard him against censure. On April 20, 1671, Shadwell wrote to both William and Margaret. To William he disclosed that “the Printing of the *Humourists* has given me a new occasion of troubling you, and desiring your Favour to be an Advocate, for me, to my Lady Dutchess, to procure me her Pardon, and a favouroble reception of that little Comoedy”.⁷⁸² Likewise, he begged Margaret’s “Pardon for my self, and this imperfect Piece, for which I have borrowed the Patronage of your Name”.⁷⁸³ While Cavendish may have enjoyed his work on first reading, Shadwell evidently failed to inform her of his dedication, and feared that she would not appreciate being associated with the play due to its controversial reception. But a letter to Cavendish from a month later indicates that Shadwell’s ploy for benefaction paid off. He thanked her for a “Noble present” and stated that it would have “been Bounty enough (and as much as I could have expected) for your Grace to have Pardoned the presumption of my Dedication”.⁷⁸⁴

Shadwell was no stranger to controversy. His 1668 *Sullen Lovers* (which was dedicated to William Cavendish) caused an uproar among court circles as “Sir Positive At-All” was said to have been a satire on Dryden’s brother-in-law, the playwright Robert Howard.⁷⁸⁵ Shadwell protested, however, that such objections were ill founded because he did not stage individuals. He challenged his enemies to accuse him “of representing

⁷⁸¹ Shadwell, *The Humourists: A Comedy* (London, 1671), “Epistle Dedicatory”.

⁷⁸² *Letters and Poems*, 127.

⁷⁸³ *Letters and Poems*, 129.

⁷⁸⁴ *Letters and Poems*, 130.

⁷⁸⁵ See Bennett, “Thomas Shadwell”, *ODNB*.

the real actions, or using the peculiar, affected phrases, or manner of speech of any one particular Man, or Woman living”.⁷⁸⁶ Instead, Shadwell claimed that he captured the humours of certain types of individuals. Defining “humour” in his prefatory poem, Shadwell writes that “A Humor is the Biasse of the Mind, / By which, with violence, ’tis one way inclin’d. / It makes our actions lean on one side still, / And, in all Changes, that way bend the Will”.⁷⁸⁷ At the most fundamental level, Shadwell maintains that a comedy of humours “is the effect of observation, and observation the effect of judgment”.⁷⁸⁸ This suggests that judgment governs plain-sight observations, and both of these are indispensable to the process of abstracting from individuals observed in the courts to embody the lineaments of a type of man or woman for dramatic representation. Shadwell’s methodological musings in his preamble to the *Humourists* set Cavendish’s motives for resisting experimentation in perspective. The methods of the poet and playwright, as characterised by Shadwell, are almost identical to those required of the Aristotelian natural philosopher. If the latter were displaced, the courts could suddenly cease to be a fertile training ground for poets and natural philosophers to conjointly acquire the requisite skills of their trades.

Against this backdrop, Sprat characteristically attempts to distinguish the comedies of the “*Wits and Railleurs of this Age*” from natural philosophers in his *History of the Royal Society* by writing that

Laughter is the easiest and the slendrest fruit of *Wit*; they are to understand, That it proceeds from the observation of the *deformity* of things; but that there is a nobler and more masculine pleasure, which is rais’d from beholding their *Order* and *Beauty*: From thence they may conclude, how great the difference is between them, and the real *Philosophers*: For while *Nature* has only form’d them to be

⁷⁸⁶ *The Humorists*, A2v.

⁷⁸⁷ *The Humorists*, A4v.

⁷⁸⁸ *The Humorists*, A3r.

pleas'd with its irregularities and monsters, it has given the other the delight of knowing and studying its most *beautiful Works*.⁷⁸⁹

In stark contrast to Sprat's characterisation of the wits, Shadwell states that a comedy of humours cannot represent natural deformities if it is to be effective. Indeed, he held that it was "below a man, to fall upon the natural imperfections of men, as of Lunaticks, Ideots, or men born monstrous. But these can never be made the proper subject of a Satyr, but the affected vanities, and artificial fopperies of men".⁷⁹⁰ Shadwell thus sought to capture the artificial deviations from natural actions that are insufficiently masked in the courts. Similarly, it was not chiefly the poets but figures in the early Royal Society whom Cavendish considered to go astray in their desire to collect curiosities and catalogue abnormalities. Shadwell's belief that true poets grapple with artificial eccentricities—while the unskilled or ill-natured gawk at the monstrous—reflects Cavendish's distinction between physicians and experimental philosophers in *The Blazing World*.⁷⁹¹ After being asked whether they dissect monsters, the physicians state that they dissect "for no other end, but to observe what defects or distempers they had, that we may cure the like in living ones, so that all our care and industry concerns onely the preservation of Mankind". By contrast, the "Experimental philosophers" engage in "the dissection of Monsters" without a care for whether they "prevent the errors of Natures irregular actions".⁷⁹² As might be expected, the Empress sides with "Galenick Physicians" whom she consults "about several Diseases".

⁷⁸⁹ Sprat, *History of the Royal-Society of London* (London, 1667), 418.

⁷⁹⁰ *The Humorists*, A1r. See Close, "Commonplace Theories of Art and Nature in Classical Antiquity and in the Renaissance" (1969).

⁷⁹¹ On the connection between literary and philosophical methodology, see Grant, *Literature and the Discovery of Method in the English Renaissance* (1985), 48-62.

⁷⁹² *Observations*, 157-8.

We saw in 2.1 that moral philosophy had a physiological grounding, and this allowed Shadwell to compose a “comedy of humours”. For most seventeenth-century writers, it remained the case that human nature—or the internal principles of each human life—was chiefly determined by the sanguine, phlegmatic, melancholic, and choleric humours.⁷⁹³ While individuals may incline towards certain humoral imbalances, these were not fixed and could be remedied by assimilation (through a change in diet) or purging (through the letting of blood).⁷⁹⁴ Another possible—and potentially less painful—way of balancing the humours was the cathartic process of attending theatrical performances. Far from staging deformities for cheap laughs, Shadwell went beyond common catharsis and intentionally shaped his plays as satires on humoral imbalances.⁷⁹⁵ His dramas were to alert audience members to the vices that they shared with the staged types for corrective purposes. Shadwell was chiefly drawing from the Jonsonian tradition, but he may have also recognised the reflection of his literary method in Cavendish’s approach to the human body and natural world. In his elegy to Cavendish, Shadwell reveals that he was fully conversant with her philosophical motifs, writing that “She could a Reason for each Cause present, / Not trusting wholly to Experiment, / No Principles from others she purloyn’d, / But wisely Practice she with Speculation joyn’d”.⁷⁹⁶ In each line of this poem, he encapsulates a position from Cavendish’s work: natural philosophy is the search for natural causes, it should intermix ideas from various thinkers, experimentation is by no means the only way to study the natural world, and

⁷⁹³ Maclean, *Learned Medicine*, 241-2.

⁷⁹⁴ For an overview of humoral theory, see Nutton, “Humoralism” (1993).

⁷⁹⁵ On drama and humours, see Schoenfeld, *Bodies and Selves in Early Modern England: Physiology and Inwardness in Spenser, Shakespeare, Herbert, and Milton* and Paster, *Humoring the Body: Emotions on the Shakespearean Stage* (2010).

⁷⁹⁶ *Letters and Poems*, 166.

speculation should be conjoined with practical exploits (with the Royal College of Physicians serving as a model).

While the methodologies used in *The Humorists* and *Sullen Lovers* accord with an Aristotelian-Galenic understanding of human subjectivity and experience, these plays are not overly concerned with philosophical ideas. Even so, a few moments in Shadwell's earlier works hint at his philosophical awareness. In his *Sullen Lovers*, a character called Emil asserts that some thinkers "after twenty or thirty years study in Philosophy arrive no further then at the Weighing of Carps, the Invention of a travailling Wheel, or the poisoning a Cat with the oyle of *Tobacco*, these are your Wits and Vertuoso's".⁷⁹⁷ In the Cavendishes' manuscript copy of *Sullen Lovers* there are numerous annotations in Margaret's hand, and at this point it is wryly noted that these virtuosi are "all or minly of Gresham Collidge".⁷⁹⁸ Aiming his critique at a slightly different target, in *The Humorists* Shadwell has "Sneak" (a type that evolves into "Sir Formal" in *The Virtuoso*) say to "Lady Loveyouth" that "These Philosophers aver, that all Spirits are transported through the Air in their several and respective Vehicles; now this was infernal, and had a Bituminous Vehicle, which by a violent Motion against the Coach-House, as it were by Collision, did generate this Flame, which had like to have caus'd this Conflagration".⁷⁹⁹ As we saw in 3.1, Cavendish satirised Henry More's immaterial spirits and their material vehicles at length in *The Blazing World*. In keeping with Shadwell's belief that a comedy of humours should not represent individuals, "Sneak" is not an exact parody of More. Yet there can be little doubt that More was in Shadwell's mind when he shaped Sneak as a young Parson and fellow of a college who speaks in a pretentious manner with doses of

⁷⁹⁷ Shadwell, *Sullen Lovers, or, The Impertinents* (London, 1670), 36.

⁷⁹⁸ NUL, Pw V 34, ff. 19r.

⁷⁹⁹ *The Humorists*, 59.

Greek and Latin. The above passage in fact strongly resonates with a moment from *The Blazing World* in which Cavendish states that “if you mortals will have Vehicles for your Souls, and a place that is between Heaven and Hell, it must be Purgatory, which is a place of Purification, for which action Fire is more proper then Air, and so the Vehicles of those souls that are in Purgatory cannot be airy, but fiery”.⁸⁰⁰ In the Origenian tradition upon which More was drawing, there is a conflagration at the end of each age, after which the purest souls ascend to the Deity and the remainder reincarnate into earthly forms.⁸⁰¹ Further suggesting that Shadwell incorporated Cavendish’s satire on More, the Cavendishes’ manuscript copy of *The Humorists* is almost identical to the one eventually printed, but the above lines from Sneak are absent. This implies that it may have been a late interpolation crafted to please his patron and dedicatee.⁸⁰²

Despite being published five years later, Shadwell conceived of *The Humorist* as a precursor to *The Virtuoso*, writing in his dedication to William Cavendish in the latter that “natural imperfections are not fit subjects for comedy since they are not to be laugh’d at but pitied. But the artificial folly of those who are not coxcombs by nature but with great art and industry make themselves so is a proper object of comedy, as I have discoursed at large in the preface to *The Humorists*”.⁸⁰³ The experimental philosophers may not quite count as monsters; however, their addiction to observing preternatural creatures with artificial instruments is a deviation from the ordinary that makes them appropriate subjects for a satirical comedy of humours. In *The Virtuoso*, Shadwell thus shapes two types: Sir Nicholas Gimcrack, “the virtuoso” and “mechanic philosopher”,

⁸⁰⁰ *The Blazing World*, 79.

⁸⁰¹ See Bianchi, “Origen’s Treatment of the Soul”.

⁸⁰² See NUL, MS Pw V 35, ff. 64.

⁸⁰³ Shadwell, *The Virtuoso*, ed. by Nicolson and Rodes (1966), 4.

and Sir Formal Trifle, “the greatest master of tropes and figures, the most Ciceronian coxcomb, the noblest orator breathing”.⁸⁰⁴ Epitomising the extremities of the collector naturalist and Ciceronian orator, Shadwell considered an over-reliance on art to unsettle the humoural balance of these types. In *The Blazing World*, the Empress similarly states that just as experimental philosophers excessively depend on artificial contrivances, orators often stick far too close to “the Rules of Art, and confunded themselves with too nice formalities and distinctions”.⁸⁰⁵ Against the extremes of Gimcrack and Trifle, Shadwell places the “gentlemen of wit and sense”, Bruce and Longvil. Possessing balanced humours, they appreciate art and literature (along with women and playhouses). In shaping this type, Shadwell took his model as the “court wits” of the 1670s amongst whom he was situated, and which also included the likes of George Villiers (Duke of Buckingham), Lord Buckhurst (Earl of Dorset), and John Wilmot (Earl of Rochester).⁸⁰⁶

Although the Royal Society’s propagandists sometimes made it out as if they were facing an onslaught from “*Wits and Railleurs*”, the only other courtly writer notable for his satires of the Royal Society was Samuel Butler. Most remembered for his *Hudibras* of 1663, Butler also satirised the Royal Society and its members in *The Elephant in the Moon*; *The Royal Society*; *An Occasional Reflection upon Dr. Charleton’s feeling a Dog’s Pulse at Gresham College*; and the *Character of a Virtuoso*. None of these appeared in print until 1759, but they all circulated widely in manuscript.⁸⁰⁷ Butler in fact wrote a jocular poem “To Thomas”, and was probably

⁸⁰⁴ *The Virtuoso*, 11 and 43.

⁸⁰⁵ *The Blazing World*, 56.

⁸⁰⁶ The best overview of the culture of the court wits remains Wilson, *The Court Wits of the Restoration: An Introduction* (1948). For some important revisions, see Love, *English Clandestine Satire, 1660-1702* (2004).

⁸⁰⁷ See Butler, *The Genuine Remains in Verse and Prose*, ed. by Thyer (London, 1759), Vol. 1, 1-43, 280-5 and Vol. 2, 185-9.

another inspiration behind *The Virtuoso*.⁸⁰⁸ More frequently, however, the court wits were indifferent or even vaguely attracted to experimentation.⁸⁰⁹ George Villiers was an original FRS, and, assisting Villiers in his preparation of *The Rehearsal*, Sprat was something of a wit.⁸¹⁰ Possessing little by way of philosophical expertise, Sprat was probably made a member of the Society so that his literary skill could be applied to the writing of its *History*.

Yet, in the process of integrating (and ingratiating) prominent courtiers, the Royal Society steadily severed the literary concerns of the courts from natural philosophical endeavours. In this regard, it is revealing that Shadwell aimed his satire at the “virtuosi”. Broadly speaking, a virtuoso was a courtier who was occupied by experimental natural philosophy or history, operative arts such as painting and architecture, along with collecting (especially of an antiquarian nature).⁸¹¹ It remained the case throughout the seventeenth century that there was no such thing as a professional “natural philosopher” in England. That said, in comparison to the more rigorous undertakings of Boyle and Hooke, the likes of Ashmole and Evelyn were amateur collectors or connoisseurs.⁸¹² Despite this, upon receiving Evelyn’s “book named a discours of forest tres”—or his 1662 *Sylva, or a Discourse of Forest-Trees*—Cavendish replied that he is more suited to

⁸⁰⁸ See de Quehen, “Samuel Butler”, *ODNB*.

⁸⁰⁹ On the amateurism of the virtuosi, see Stimson, *Scientists and Amateurs: A History of the Royal Society* (1949), and, among the court wits, see Love, “Shadwell, Rochester, and the crisis of amateurism” (1996).

⁸¹⁰ See Wilson, *The Court Wits of the Restoration*, 19 and 158.

⁸¹¹ On the values of the virtuosi, see Houghton, “The English Virtuoso in the Seventeenth Century: Part I” (1942) and “The English Virtuoso in the Seventeenth Century: Part II” (1942). On natural history and collecting among the virtuosi, see Hunter, *Science and the Shape of Orthodoxy*, especially 21-42, 135-50, and 181-200 and Hanson, *The English Virtuoso: Art, Medicine, and Antiquarianism in the Age of Empiricism* (2009).

⁸¹² On Ashmole and Evelyn as collectors, see Hunter, *Elias Ashmole, 1617-1692: The Founder of the Ashmolean Museum and His World* (1983) and Zytaruk, “‘Occasional specimens, not complete systems’: John Evelyn’s Culture of Collecting” (2001).

be “the head then a member of the royal society”.⁸¹³ Coming from Cavendish, this was not a straightforward compliment.

Rather than simply opposing experimentation, it seems that Shadwell and especially Cavendish chiefly targeted courtly scholars turned collector naturalists, whom they saw as substituting natural philosophy and literature with the less noble art of mechanics. While Cavendish dedicated much of her time to a critique of Hooke’s methodological introduction—which she saw as supporting Evelyn’s mode of collection—she was far more sympathetic towards Boyle. In *Philosophical Letters*, she shaped Boyle as

a very civil, eloquent, and rational Writer; the truth is, his style is a Gentleman’s style. And in particular, concerning his experiments, I must needs say this, that, in my judgment, he hath expressed himself to be a very industrious and ingenious person; for he doth neither puzzle Nature, nor darken truth with hard words and compounded languages, or nice distinctions; besides, his experiments are proved by his own action.⁸¹⁴

Cavendish accordingly commends Boyle’s civility and his prose style, strongly influenced as it was by French romances and popular literature.⁸¹⁵ Compared to Sprat’s description of experiments as “real, and impartial *Trails*”, she also appreciated that Boyle used first-person narratives to situate his experiments within a broader experiential framework.⁸¹⁶ Boyle in fact repeats throughout his publications that natural philosophy must “build upon two foundations, *Reason* and *Experience*”, which are precisely the “two

⁸¹³ BL, Add. MS 78688, 85v. While this letter has been overlooked in David Galbraith’s *The Letterbooks of John Evelyn*, it was cleaned up and printed in *Diary and Correspondence*, Vol. 3, 226.

⁸¹⁴ *Philosophical Letters*, 495-6.

⁸¹⁵ See Principe, “Virtuous Romance and Romantic Virtuoso: The Shaping of Robert Boyle’s Literary Style” (1995).

⁸¹⁶ Anstey and Hunter, “Robert Boyle’s ‘Designe about Natural History’” (2008) and Sargent, *Diffident Naturalist: Robert Boyle and the Philosophy of Experiment* (1995), 50-6. Cf. Markley, “Objectivity as Ideology: Boyle, Newton, and the Languages of Science” (1983).

grounds” of Cavendish’s natural philosophy.⁸¹⁷ The later scholarly skirmish between Stubbe and Glanvill underscores that both thinkers who defended learned institutions and those who challenged Aristotle and the universities wanted to claim Boyle for their side. Excluding “Sir *Robert Murray*, Dr. *Wren*, or Dr. *Wallis*” from his condemnation of the Royal Society, Stubbe states that “to suspect that the truly Honorable and *inquisitive* Mr. *Boyle* would abet a *design* that should subvert *piety*, and the *Protestant Religion*, doth not become any that knows *him*, or his *Writings*”.⁸¹⁸ Given Boyle’s bipartisan cachet, Cavendish’s esteem for his work should come as no surprise.

Despite her general appreciation of Boyle’s writing, his mechanical devices were still subjected to Cavendish’s satire. Boyle was notorious for his air-pump by 1666, and, especially given her rejection of the vacuum, Cavendish could not help but have her “Lice-men” (mathematicians) endeavour “to measure all things to a hairs breadth, and weigh them to an Atome; but their weights would seldom agree, especially in the weighing of Air, which they found a task impossible to be done”.⁸¹⁹ Like Cavendish, Shadwell has Gimcrack employ others to “bottle up Air, and weigh it in all places” using “pneumatic engines”.⁸²⁰ Yet, contrary to what some have thought, it is not the case that Gimcrack simply *is* Boyle.⁸²¹ Reflecting Cavendish’s satirical engagement with Dee and More in *The Blazing World*, Gimcrack is “skill’d in Rosicrucian learning” and has

⁸¹⁷ Boyle, *The Christian Virtuoso* (London, 1690), 5.

⁸¹⁸ Stubbe, *Legends no Histories: Or, a Specimen of Some Animadversions Upon the History of the Royal Society* (London, 1670), A4r. On Stubbe, see Hunter, *Science and Society in Restoration England*, 139-40 and Cook, “Physicians and the New Philosophy: Henry Stubbe and the Virtuosi-Physicians” (1989).

⁸¹⁹ *The Blazing World*, 56.

⁸²⁰ *The Virtuoso*, 104 and 110. On Shadwell and Boyle, see Anstey, “Literary Responses to Robert Boyle’s Natural Philosophy” (2007) and Hunter, *Robert Boyle: Scrupulosity and Science* (2000), 236-44.

⁸²¹ Cf. Shapin and Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (2011), 70.

“familiar conversations with spirits”.⁸²² At some moments, Shadwell’s “virtuoso” also resembles Hooke more than Boyle, with Gimcrack’s nieces (Clarinda and Miranda) referring to him as a “sot that has spent two thousand pounds in microscopes”. Echoing Cavendish’s critique of Hooke, they go on to castigate him because he “has broken his brains about the nature of maggots” and “has studied these twenty years to find out the several sorts of spiders, and never cares for understanding Mankind”.⁸²³ In the second week of its showing, Hooke attended *The Virtuoso* and left the theatre convinced that the play attacked him personally, writing in his diary for that day: “Damned Doggs. *Vindica me Deus*. People almost pointed”.⁸²⁴ Redoubled by the accusations that beset *Sullen Lovers* and *The Humorists*, Hooke denied that Shadwell sufficiently distanced himself from particular individuals. But rather than staging Hooke as such—who relied heavily on reason and hypothesis in practice—it seems that Gimcrack was the archetypal natural philosopher of the Royal Society’s apologists. He is the naturalist in the preface to Hooke’s *Micrographia*, voraciously and indiscriminately conducting experiments.

Perhaps by the time that he attended *The Virtuoso*, Hooke had good reason to be defensive of microscopy. Broaching the topic in a paper read before the Royal Society in 1692, Hooke lamented that none of his peers (save Anthony Leeuwenhoek) made “any use of that Instrument, but for Diversion and Pastime”.⁸²⁵ At odds with the teleological notion that mechanical instruments gradually monopolised natural philosophy, Hooke perceived a general turn against microscopy.⁸²⁶ Numerous figures in the Royal Society

⁸²² *The Virtuoso*, 10.

⁸²³ *The Virtuoso*, 22.

⁸²⁴ Hooke, *Diary, 1672-80*, ed. by Robinson and Adams (1968), 235. Despite his initial indignation, Hooke seems to have attended the play again: see 238-9.

⁸²⁵ Hooke, *Philosophical Experiments and Observations of the Late Eminent Dr. Robert*, ed. by Derham (London, 1726), 261.

⁸²⁶ The most famous example of this sort of history is Shapin and Shaffer, *Leviathan and the Air-Pump*.

who were renowned for their microscopic discoveries—including Henry Power and Nehemiah Grew—even criticised the verisimilitude of observations procured with optical instruments.⁸²⁷ Hooke in some sense brought this state of affairs on himself with the artistry of his sketches and the theatricality of his experimental presentations.⁸²⁸ When deciding what experiments to show Cavendish upon her visit to the Royal Society in 1667, Boyle recommended that they present her with “the weighing of air in a receiver”, and Hooke tersely added that she must be shown “a good microscope”, probably with her recently published *Observations* in mind.⁸²⁹ Before these demonstrations, Charleton presented “A short Harangue designed to be made to the President of the Royal Society, at their entertainment of the Duchess of Newcastle with a sight of some select Experiments”. Addressing Viscount Brounckner, Charleton states that he looked “upon this happy Interview, as your public Vindication of Learned men from the vulgar imputation of Superciliousness & Inurbanity: & as her Graces solemn declaration of her good affection to all usefull Learning”.⁸³⁰ Yet the “entertainment” of air-pumps and microscopes would have only served to ratify Cavendish’s belief that experimental instruments were only fit for “pleasure and pastime”.⁸³¹ Shadwell use of optical instruments when staging *The Virtuoso* was an obvious outstretch of this trend.⁸³²

⁸²⁷ See Coppola, “‘Without the Help of Glasses’: The Anthropocentric Spectacle of Nehemiah Grew’s Botany” (2013); Arber, “Nehemiah Grew (1641-1712) and Marcello Malpighi (1628-1694): An Essay in Comparison” (1942); and Cowles, “Dr. Henry Power’s Poem on the Microscope” (1934).

⁸²⁸ See Harwood, “Rhetoric and Graphics in *Micrographia*” (1989).

⁸²⁹ Birch, *History of the Royal Society*, Vol. 2 (1967), 177. On Cavendish’s visit to the Royal Society, see Mintz, “The Duchess of Newcastle’s Visit to the Royal Society” (1952).

⁸³⁰ See MS Smith 13, ff. 21v-23v.

⁸³¹ *Observations*, 105.

⁸³² See Shanahan, “Theatrical Space and Scientific Space in Thomas Shadwell’s *Virtuoso*” (2009); Black, “The Orator in the Laboratory: Rhetoric and Experimentation in Thomas Shadwell’s *The Virtuoso*” (2013); and Chico, “Gimcrack’s Legacy: Sex, Wealth, and the Theater of Experimental Philosophy” (2008).

For all Hooke's excitement at the prospect of entertaining Cavendish with his high-powered microscope, she points out that she and William had "as good, and as many sorts of optic glasses as anyone else". At the same time, she appreciated that William did not busy himself "much with this brittle art", but employed the bulk of his time "in the more noble and heroic art of horsemanship and weapons, as also in the sweet and delightful art of poetry, and in the useful art of architecture".⁸³³ Rather than renounce the humanist emphasis on usefulness, Cavendish denied the use-value of the experiments that most figures in the Royal Society conducted. What is more, even in the practical arts there remained an overriding hierarchy. According to Aristotle, in the process of shipbuilding, the architect is indispensable, those who construct the ship are of secondary significance, and the collectors of raw materials are almost entirely replaceable.⁸³⁴ We saw Cavendish's flippant remarks upon receiving a copy of Evelyn's *Sylva* earlier, and in the letter to which she was responding he stated

That I presume to make this Small Present to your Grace (who were pleas'd to accept my Collection of *Architects*, to whom Timber and Planting ~~is~~ are subsidiaries) is not for the dignities of the Subject (though Princes have not disdain'd to cultivate Trees, and Gardens with the same hands they manegd Scepters) but because it is the best Expression of my Gratitude that I can returne.⁸³⁵

With a heavy dose of *sprezzatura*, Evelyn plays on Cavendish's traditional outlook on natural philosophy in this letter. Despite referring to *Sylva* as a small and undignified present, Evelyn made extensive additions to subsequent editions of this work in 1670,

⁸³³ *Observations*, 4. On William Cavendish and architecture, see Worsley and Addyman, "Riding Houses and Horses: William Cavendish's Architecture for the Art of Horsemanship" (2002) and Raylor, "'Pleasure Reconciled to Virtue': William Cavendish, Ben Jonson, and the Decorative Scheme of Bolsover Castle" (1999).

⁸³⁴ See Mikkeli, "The foundation of an autonomous natural philosophy", 213 and Gilbert, *Renaissance Concepts of Method* (1960), 30-1.

⁸³⁵ *The Letterbooks of John Evelyn*, Vol. 1, 552.

1679, and 1706, for which his descendants dubbed him “Sylva Evelyn”.⁸³⁶ Yet, as Evelyn knew well, Cavendish would have deemed such an undertaking to have been of far less merit than his 1664 *A Parallel of the Antient Architecture with the Modern*, which she would have appreciated both for its potential use and its historical approach. For Cavendish, Evelyn had descended the scale of disciplines in subsequent publications. The rhetoric of “under builders” who were laying the foundation for future generations among figures in the Royal Society inverted the hierarchy of disciplines in a way that Cavendish found unpalatable. No doubt poking fun at Boyle’s *Usefulness of Experimental Natural Philosophy*, Shadwell similarly has Longvil ask Gimcrack “to what end do you weigh this Air, Sir?” and in response is posed the rhetorical question: “To what end shou’d I? to know what it weights. O Knowledge is a fine thing”.⁸³⁷ By making Gimcracks household fall apart at the end of *The Virtuoso*, Shadwell intimates that the movement towards closed experimentation is not only useless but also destructive. There is a glimmer of hope at the end of the play when a repentant Gimcrack wishes that he “had studied mankind instead of spiders and insects”. Rather than finally putting his estate in order and dedicating himself to the observation of humankind, however, Gimcrack resolves to “find out the philosopher’s stone”.⁸³⁸

We have seen that *The Virtuoso* assimilates many of the criticism found in *Observations* and *The Blazing World*. Yet, while Shadwell’s work has always been read as a satire on the Royal Society, *The Blazing World* has often been interpreted as a piece of utopian fiction because Cavendish employed another world (and even other creatures)

⁸³⁶ See Hunter and Harris, “Introduction”, *John Evelyn and his Milieu* (2003), 1.

⁸³⁷ *The Virtuoso*, 110.

⁸³⁸ *The Virtuoso*, 139.

to place distance her critique and its objects.⁸³⁹ Despite their lack of mechanical instruments, the Empress found the beings in the *Blazing World* to be “as ingenious and witty in the invention of profitable and useful Arts, as we are in our world, nay, more”.⁸⁴⁰ To further their knowledge, she established “societies of the Vertuoso’s”.⁸⁴¹ Many of the opinions that particular societies express reflect Cavendish’s own. For instance, the fish- and worm-men (natural philosophers) tell Cavendish that “heat and cold were not the primary producing causes of either Vegetables or Minerals, or other sorts of Creatures, but onely effects”.⁸⁴² Rejecting the idea that elements are primary causes, she writes explicitly in *Observations* that “it is as much absurdity, as impossibility, to constitute some particular action the common principle of all natural heat or cold, and to make a universal cause of a particular effect”.⁸⁴³ As we saw in the last part of the chapter, Cavendish held that the interjection of perceptive principles cause optical instruments to present misleading images. The worm-men accordingly tell her that she will not be able to use microscopes to observe underground because the creatures that abide there “have not such an optick sense as those that live on the surface of the Earth: wherefore, unless you had such glasses as are proper for their perception, your Microscopes will not be any ways advantageous to them”.⁸⁴⁴ Since worms are capable of using their natural senses to observe the bowels of the earth, the Empress takes the opinion of the worm-men as

⁸³⁹ See, for example, Holmesland, *Utopian Negotiations: Aphra Behn and Margaret Cavendish* (2013); Leslie, “Gender, Genre and the Utopian Body in Margaret Cavendish’s *Blazing World*” (1996); Khanna, “The Subject of Utopia: Margaret Cavendish and Her Blazing-World” (1994); Lilley, “Blazing Worlds: Seventeenth-Century Women’s Utopian Writing” (1992); Pearl, *Utopian Geographies & the Early English Novel* (2014); and Poole, “Francis Godwin, Henry Neville, Margaret Cavendish, H.G. Wells: Some Utopian Debts” (2003).

⁸⁴⁰ *The Blazing World*, 15.

⁸⁴¹ *The Blazing World*, 19.

⁸⁴² *The Blazing World*, 39.

⁸⁴³ *Observations*, 113.

⁸⁴⁴ *The Blazing World*, 42.

authoritative. In defending optical instruments, Hooke noted that our sense can “be in many particulars much outdone by those of other Creatures”, but Cavendish believed that we should endorse this difference in natural capabilities based on the diverse composition of plant and animal organs.⁸⁴⁵

Regarding the formation of her parahumans and their societies, it is interesting that Cavendish distinguished between natural and experimental philosophers. Whereas the former express speculative ideas that resemble her own, the latter’s use of instruments led them to chronicle extraordinary observations. “Natural philosophy” is often used as a shorthand for both the speculative and experimental variety, but Cavendish’s categorisation reveals that she saw experimentation as taking on its own life. Even though she put some of her ideas into the mouths of natural philosophers, the Empress ultimately dissolves all of the societies because she fears that their skirmishes would clear the way for “an open Rebellion, and cause a great disorder and ruine of the Government”. After their disbanding, she reintroduces “the same form of Government again, which had been before; that is, to have but one Sovereign, one Religion, one Law, and one Language”.⁸⁴⁶ Change was central to Cavendish’s notion of the natural world, but she held that the authority of traditional institutions (the state, the Church, and the universities) should quell discord and prolong the status quo. For Cavendish, the Royal Society grew out of the Interregnum, and an institution that emerged from unrest could only spawn further disarray.

Although *The Blazing World* resonates with *The Virtuoso*, Cavendish’s support of learned institutions already suggests that the motivation behind her satire deviated from

⁸⁴⁵ *Micrographia*, A1r-v.

⁸⁴⁶ *The Blazing World*, 121.

Shadwell's. In this regard, it is notable that her satire bears a number of historical links and intellectual affinities with thinkers in Oxford, and especially at Christ Church. Formed around John Fell, Richard Allestree, and John Dolben, Christ Church was the Royalist and Anglican stronghold in England during the Interregnum.⁸⁴⁷ At this time, Cavendish was connected to Christ Church through George Morley, and maintained contact after the Restoration through Jasper Mayne. Indeed, Mayne's 1664 translation of *Lucian*—which was started as early as 1638 at William Cavendish's bequest—was probably an inspiration behind *The Blazing World*. Cavendish thus commences this work with the claims that she provides a "Description of a *New World*, not such as *Lucian's*, or the *French man's World* in the Moon; but a World of my own Creating, which I call the *Blazing-World*".⁸⁴⁸ Moreover, except for Butler (and Cavendish), it was not the "court wits" but university figures who satirised the Royal Society during the 1660s.⁸⁴⁹ The Savilian Professor of Geometry at Oxford and original FRS, John Wallis, recorded that Robert South gave a speech that consisted of "Satyrical Invectives, against Cromwell, Fanaticks, the Royal Society, & New Philosophy" upon the opening of the Sheldonian Theatre in 1669.⁸⁵⁰ While this speech is not extant, South similarly inveighed in a sermon at Westminster Abbey in 1667 that there was a "diabolical society, for the finding out new experiments of vice [...] obliging posterity with unheard of inventions and

⁸⁴⁷ See Beddard, "Restoration Oxford and the Remaking of the Protestant Establishment" and "Tory Oxford" (1997).

⁸⁴⁸ *The Blazing World*, B1v. Mayne evidently had a longstanding interest in stars and other worlds, since he states in his letter to William Cavendish from 1639 that "though y^e Merits which I bring with me have only the Capacitye of some obscure Meteors to be Exhaled, yet being drawne up, they cannot but, from yo^r Lordshippes bright reflections upon them gayne one Capacitye of Meteors more, and take y^e Appearance of starrs" (NUL, MS Pw 1/181).

⁸⁴⁹ On the institutional jealousies of the universities, see Feingold, "Mathematical Sciences and New Philosophies", 390-2 and 422-3; Hunter, *Science and Society*, 136-61; and Cook, *Decline of the Old Medical Regime*, 133-82.

⁸⁵⁰ *The Correspondence of Henry Oldenburg, Volume VI, 1669-1670*, ed. by Hall and Hall (1969), 129.

discoveries in sin; resolving herein to admit of no other measure of good and evil, but the judgment of sensuality”.⁸⁵¹ South was a student of Christ Church and a member of Fell’s Anglican congregation during the Interregnum, and, since Fell’s antagonism towards the Royal Society was well known, he may have put South up to his speech.⁸⁵²

Echoing the critique of South, Cavendish repeats throughout *Observations* and *The Blazing World* that some of her contemporary natural philosophers

pull down the learning of ancient authors, to render themselves famous in composing books of their own. But though this age does ruin palaces, to make cottages; churches, to make conventicles; and universities to make private colleges; and endeavour not only to wound, but to kill and bury the fame of such meritorious persons as the ancient were; yet, I hope God of his mercy will preserve state, church, and schools, from ruin and destruction.⁸⁵³

Cavendish feared that the anti-Aristotelianism of the Royal Society’s propagandists could serve to both displace philosophical pluralism and compromise traditional institutions of learning. Yet, despite her use of rhetorical tropes that resound with the sentiments of South, there is reason to believe that Cavendish’s efforts to ally herself with the universities was not wholly successful after 1664. This seems to have been the repercussion of a controversy (or misunderstanding) that occurred between Cavendish and Fell, who was dean of Christ Church, vice-chancellor of Oxford University, and, subsequently, Bishop of Oxford.⁸⁵⁴ In an early letter to Cavendish, Fell wrote that “Having received a Copy of your Works, for the use of the Library of *Christ-Church*, and

⁸⁵¹ South, *Twelve Sermons Upon Several Subjects and Occasions*, Vol. 2, (London, 1727), 38-9. On South, see Reedy, *Robert South (1634-1716): An Introduction to his Life and Sermons* (1992).

⁸⁵² On Fell’s antagonism to the Royal Society, see the dedication in Stubbe, *A Censure Upon Certain Passages Contained in the History of the Royal Society* (London, 1669).

⁸⁵³ *Observations*, 8.

⁸⁵⁴ For Fell’s biography, see Larminie, “John Fell”, *ODNB*. On his place in seventeenth-century Oxford, see Keene, “John Fell: Education, Erudition and the English Church in Late Seventeenth-Century Oxford” (2003). On Fell and Oxford University Press, see Morison, *John Fell, the University Press and the ‘Fell’ Types* (1967) and *The History of Oxford University Press: Volume 1: Beginnings to 1780*, ed. by Gadd (2014), especially chapters 3, 4, and 11.

another as a particular favour to my self; I hasten to make my acknowledgements for both: and must beg leave to say that your Excellency has found the way to make the Arts truly liberal".⁸⁵⁵ This epistle is undated but was presumably written in 1663, when Cavendish sent many of her books to Oxford colleges. As Mayne relayed to Cavendish from Christ Church in May 1663, "Your Books have here had a very honourable, and publick Reception, and are not only placed in the private Libraries of every single Colledge, but in the publick also".⁸⁵⁶ Mayne was not exaggerating in his letter: almost all of the Oxford colleges possessed the six volumes that Cavendish published (or republished) between 1662 and 1664.⁸⁵⁷

Not only is Fell's expression of appreciation for Cavendish's books half-hearted, but it also seems that he either did not peruse the works before sending his letter or masked his genuine opinions of them. This is implied in a letter to Charleton in which Fell writes that "I understand some Persons have, according to the method of ill Nature, pleased themselves in doing me unhandsome Offices, with the Excellent Princess her Grace. Whose great and piercing Understanding will, I hope, unravel their vile Arts, who can only recommend themselves by traducing others".⁸⁵⁸ A severe man with a good deal of power and reason to excoriate anyone who could leave the established order susceptible to scruples, Fell was bound to make enemies who may have spread rumours about him. But it is equally (if not more) plausible that he had his doubts about Cavendish. As a woman outside the institution who published in the vernacular, Fell may have wanted to push back against the rapport that had formed between Cavendish and

⁸⁵⁵ *Letters and Poems* 97.

⁸⁵⁶ *Letters and Poems*, 23.

⁸⁵⁷ See Poole, "Margaret Cavendish's Books in New College, and Around Oxford" (2015).

⁸⁵⁸ *Letters and Poems*, 101-2.

Oxford University. Even so, in an attempt to ease any discrepancies, Fell pleaded with Charleton to “speak a great Truth, and do no less an Obligation both to this Place and me” by assuring “my Lord Duke and his incomparable Princess, that this University and my self have all imaginable gratitude for their Favours, and Veneration for their Persons”. Charleton almost certainly translated the edition of *De vita ... Guilielmi ducis Novo-Castrensis* that was eventually printed, since he includes “Guilielmi Ducis Novcastrensis vita, Londini, 1678. in Folio” in the post-script to his 1683 *Three Anatomic Lectures* regarding his previous publications.⁸⁵⁹ It was probably for this reason that he sent the work to Christ Church through Henry Yerbury, and that Fell subsequently sent his respects to Cavendish through Charleton.

But there are in fact partial translations of *De vita* that are related to the University of Oxford. At the University of Nottingham, there is a manuscript copy of the first twenty pages of *De vita*, at the end of which there is a note by Margaret that the translation is “Concerning my Lords Life in Latne from y’Univ”.⁸⁶⁰ There is also part of the third book of *De vita* in a different hand that is currently held in the Bodleian, and which was in all probability produced by a university fellow.⁸⁶¹ Because Charleton was not associated with the universities, someone else must have started the translation. We cannot be certain why the prior projects were aborted, but it could have been that Fell was unhappy with Cavendish’s accosting of translators at Christ Church. That she was doing just this is implied by Tully’s suggestion in his copy of *Philosophical and Physical Opinions* that “The Tales [might be translated] by one of Ch Ch”, referring to *Natures*

⁸⁵⁹ *Three Anatomic Lectures*, P3r-4v.

⁸⁶⁰ NUL, Pw 1/609, ff. 1-20.

⁸⁶¹ MS Rawl D 1208, 97v-116v.

Pictures.⁸⁶² As we have seen, Mayne also agreed to help her find a translator in 1663 so that her writing could “travel beyond the Seas, and spread themselves, both to your Honour, and the Honour of your Nation, as far as the Commonwealth of Learning reaches”.⁸⁶³ Indicating that he had been in conversation with Tully, Mayne proceeds to state that he has “put your Book of Tales in the Hand of a fit person to translate them into *Latine* as I think either University can afford”. We also know that Cavendish sent her English *The Life of William* to the other colleges in Oxford through Mayne, for Barlow wrote to her in February 1667 that “I received by the hands of (your Grace’s faithful Servant, and my worthy Friend) Dr. *Mayne*, two Copies of my Lord Duke’s life, (writ by your Grace) one for our Colledge, and another for my self”.⁸⁶⁴ But that she chose to sail her books into Christ Church through an alternative implies that she felt the need to take precautions. In any case, in a letter from Fell to William Cavendish that has the same date as the letter to Charleton, he echoes the words of Mayne, writing that “just felicity having happened to your Grace, by the Pen of your Illustrious Princess, it remained that one narrow dialect, should not confine that Relation to this our Island, which was to give Example to the Heroes of all Nations”.⁸⁶⁵ That Cavendish sent both the English work and the Latin translation to Christ Church is also consistent with its holdings. What is more, Christ Church is the only college in Oxford that currently possesses a copy of *De vita*.⁸⁶⁶ This suggests that one of the reasons that Cavendish had her *Life of William*—which glorifies the Royalist troupes and is dedicated to Charles II—put into Latin was to win

⁸⁶² See BL, *Philosophical and Physical Opinions*, 8407.h.9.

⁸⁶³ *Letters and Poems*, 94.

⁸⁶⁴ *Letters and Poems*, 73.

⁸⁶⁵ *Letters and Poems*, 106.

⁸⁶⁶ There is, however, a copy of *De vita* that Cavendish gifted to Balliol College that is now at the Library of Congress in Washington, D.C.: *De vita ... Guilielmi ducis Novo-Castrensis*, DA407.N5 N5.

over the staunchly traditional Fell or at least to boast that she managed to have it translated.

It is surely no coincidence that Fell became vice-chancellor of Oxford in 1666, the same year that Cavendish published *Observations* and decided not to sent it to Oxford. The only copy of *Observations* in Oxford is at Queen's College, and this was probably a personal gift to Barlow, with whom Cavendish never severed ties. In spite of her attempts to secure the backing of traditional institutions of learning, the episode with Fell points to the power of individuals within the universities to shape intellectual life. Taking a very different approach to Fell, Widdrington wrote to Cavendish in October 1668 that "especially we of *Cambridge*" delight in "your most judicious and elaborate Observations upon Experimental Philosophy".⁸⁶⁷ Given its date, this may be a dig at Oxford, since Cambridge was now the sole recipients of Cavendish's beneficence. While Cavendish sought to align herself with the Reformed scholars and divines of Oxford, she was ultimately received more favourably at Cambridge, notwithstanding her continued relationship with figures such as Mayne and Barlow. Whereas Fell seems to have deterred Cavendish from sending books to Oxford, Glanvill (who was inspired by the likes of More at Cambridge) writes to Cavendish that since "most of the considerable Libraries of *England* can bear a Testimony" of your books, "I am bold upon the confidence I have in your Grace's goodness, to become an humble Solicitor in the behalf of ours, which will be very much ennobled by so glorious an Instance of your Grace's Favour, if you shall please to Honour it with those Ingenious Works".⁸⁶⁸ Although *Philosophical Letters* and *Observations* contain criticisms of his ideas, he accordingly

⁸⁶⁷ *Letters and Poems*, 30.

⁸⁶⁸ *Letters and Poems*, 103.

solicited her books for Bath Abbey Library. As such instances suggest, the less orthodox were often more receptive of Cavendish's works, even as she promoted traditional learning and saw them as challenging her status as a natural philosopher. Despite Fell's conciliatory gestures, Cavendish never did send her final philosophical publication of 1668, *Grounds of Natural Philosophy*, to Oxford. But she distributed many copies to the colleges of Cambridge, dedicating it vaguely "To all the Universities in Europe".

While they lack *Observations*, the vast majority of Oxford colleges possess copies of *Life of William*. Rather than displaying her pluralistic intermixture of philosophical ideas, the biography of her husband obviously focuses on a particular individual. This is somewhat ironic given that Cavendish most appreciated the breadth of Stanley's *History*, but it is also understandable because she was writing on a far more politically fraught topic and desired to avoid political controversy. To this end, Cavendish follows Stanley in striving after impartiality: "Since my chief intent in this present Work, is to describe the Life and Actions of My Noble Lord and Husband, *William, Duke of Newcastle*, I shall do it with as much Brevity, Perspicuity and Truth, as is required of an Impartial Historian".⁸⁶⁹ Barlow echoes this sentiment when he writes that "I have read your Graces Book, which is writ with so much evenness and propinquity of Style, so much truth and generous impartiality, as well becomes the (Illustrious persons most concerned, the) great Subject and Author of it".⁸⁷⁰

Noteworthy in this regard is the thoroughly annotated (but unstudied) edition of *De vita ... Guilielmi ducis Novo-Castrensis* in the British Library.⁸⁷¹ In the front-leaf of

⁸⁶⁹ Cavendish, *The Life of the Thrice Noble, High and Puissant Prince William Cavendish, Duke, Marquess and Earl of Newcastle* (London, 1667), 1.

⁸⁷⁰ *Letters and Poems*, 74.

⁸⁷¹ See BL, *De vita ... Guilielmi ducis Novo-Castrensis*, 611.1.16.

this book is written “Anglesey. Donum D.ⁿⁱ Comibis Ogle. nou.18.1676”. As this suggests, the book was a gift from William Cavendish’s son, Henry Cavendish, the Earl of Ogle, to the Irish politician and lawyer, Arthur Annesley, the First Earl of Anglesey.⁸⁷² Annesley had the largest library of his day—with over 30,000 volumes—and listed under the heading “Geographici, Historici, Philologici, & Omissi, in Folio” in his library catalogue is “Vita Gulielmi Ducis Novo-Casstrensis, per Margaritam Ipsius Uxorem Conscript. 1668”.⁸⁷³ This is undoubtedly the book that is currently held in the British Library. One the most striking examples of engagement with Cavendish’s work by a contemporary, it contains no less than sixty-one Latin and occasionally Greek annotations, along with numerous corrections and non-verbal markers. Underscoring the continued significance of ancient poetry for understanding historical events, many of these notes are quotations from Virgil’s *Eclogues* and *Aeneid*, but there are also references to prose pieces such as Cornelius Nepos’ *Vitae excellentium imperatorum* and Caspar Schoppe’s more obscure *De Stilo: Sive De Stili Historici virtutibus & vitiis Judicium*. Beyond providing another example of learned engagement with Cavendish, these annotations are notable because Annesley recorded in his diary under “memorandums. June 1. 1676” that he planned “To write the truth of the history of y^e Latte times in Latin laying moche open wherein others are obscured by flattering him who had good luck but little or no merit”, which suggests that he planned to use Cavendish’s biography as part of a larger project to produce a more inclusive and impartial history.⁸⁷⁴

⁸⁷² See Perceval-Maxwell, “Arthur Annesley”, *ODNB*.

⁸⁷³ Phillipps and Annesley, *Bibliotheca Angleseiana, sive, Catalogus variorum librorum* (London, 1686), 35.

⁸⁷⁴ BL, Add. MS 18730, ff. 2r.

Cavendish wrote in a wide range of genres—and her contemporaries read, lauded, and criticised her publications for various reasons—but we have seen that she chiefly sought to shape herself as a natural philosopher. Many letters show that Cavendish was encouraged in this endeavour by the universities up until her encounter with Fell. But figures in and around the early Royal Society threatened to make “natural philosophy” virtually coterminous with “experimentation”, squeezing Cavendish out of the status that she had spent her life cultivating. Because of this, she supported Casaubon’s and South’s defences of the universities and classical learning and Stubbe’s apology for the Royal College of Physicians against the upstart institution that was the Royal Society. Far from precipitating a battle between the ancients and moderns, the likes of Cavendish and Stanley continued to see literature as the master category under which history and natural philosophy were subsumed. All the same, Cavendish’s emphasis on speculative natural philosophy, as an historically-informed genre of literature that studies the natural world, did force her into a precarious position between two institutions: the Royal Society and the University of Oxford. As an amateur poet-scholar and patron, Stanley was part of a world that she understood. But Cavendish’s speculative natural philosophy and her critique of the Royal Society—while not as objectionable as Shadwell’s satire—was bound to be more controversial than Stanley’s impartial approach to the history of philosophy. In hopes of appealing to a broad literary audience and calling attention to the literary quality of her natural philosophy, Cavendish appended a satire on contemporary experimentation to her more critical discussion of speculation, experimentation, and the ancients. The trend away from sustained criticism of experimental philosophy does, however, signal the severing of literature and natural philosophy, with the latter

increasingly being grounded in specialised knowledge that amateur natural philosophers and poet-scholars could hardly engage with on its own terms.

4.3. The Division of Disciplines

While Cavendish appreciated the works of Sandys and Stanley, she always realised that scholarship was to remain the preserve of the schools. Yet, when she published *Poems, and Fancies*, Cavendish could not have conceived of an institution dedicated to the diffuse and pluralistic set of practices and ideas that fell under the purview of “natural philosophy”. With scholarship in the schools and natural philosophy increasingly concentrated around the Royal Society, only the composition and performance of poetry and plays remained localised in the courts during the latter half of the 1660s. It is true that figures such as Sprat and Cowley produced highly stylised pieces of poetry and prose to buttress the Royal Society’s emphasis on plain language, experimentation, and fact collection. But neither of them can truly be called natural philosophers, and their use of literary pieces to support an anti-rhetorical focus on fact collection ironically served to proliferate a distinction between the language deployed to shape such a philosophical program and the approach to the natural world itself. Conversely, as a poet and playwright who deployed an Aristotelian-Galenic methodology—and was interested in natural philosophy—Shadwell would have been an ideal candidate for writing speculative natural philosophy. Writing in the 1670s, however, he no longer conceived of speculative natural philosophy and poetry as closely aligned, though his elegy to Cavendish recognised that this had been the case. For Shadwell, writing poetry and drama (and critiquing experimental philosophy) was an obvious path to courtly prestige. He could be

more forthright in his critique of the Royal Society precisely because he was not a natural philosopher who might be summoned to defend his own principles. This of course is no more than a rough schema, and there continued to be a sprinkling of university scholars with expertise in natural philosophy, mostly in the endowed chairs, while a few active members of the Royal Society wrote poetry and plays. Yet historical trends made it the case that Cavendish's attempt to align speculative natural philosophy with what was quickly becoming the literary realm of the courts would have simply reinforced the evaluation of Aristotle as "the Philosophy of *discourse* and *disputation*".

One type among many, Shadwell chief goals in the "virtuoso" was to provoke laughs from his crowd and to please patrons like the Cavendishes. By contrast, following from her robust reproach in *Observations*, a much stronger impetus goaded Cavendish's counterblast against the Royal Society in *The Blazing World*. As has been suggested, her satire may have been stimulated by the criticism circulating among learned figures in the University of Oxford, with whom she was keen to align herself. Yet, since Cavendish was not part of the university, the defence of this institution against the challenge from the Royal Society was not an end in itself. Rather, Cavendish's critique of the Royal Society was a last-ditch effort to defy the Royal Society and to reinvigorate the slightly earlier status quo of the Republic of Letters. Over the course of the 1660s, she increasingly idealised the Republic of Letters as a social and largely courtly network in which speculative and experimental natural philosophy were less polarised endeavours, with the same figures often corresponding on mathematics, medicine, and poetry. Underpinned by an opposition to religious disputation—which Cavendish hoped would continue in the courts, even if it had to be enforced by the Church—she upheld the

Republic of Letters as possessing the social unity that enabled intellectual diversity.⁸⁷⁵ As she makes clear in *The Blazing World*, a plurality of institutions could only engender competing claims and curtail the open discussion amongst equals before long.

Because the Royal Society was a public entity that met as a private body—from which Cavendish was excluded—she saw it as a challenge to the web of private correspondences that she had laboured to cultivate. Not a body contrived in or by one nation, the Republic of Letters would never lead to state unrest. While Cavendish eventually ran into troubles with Fell—and perhaps realised that the universities were more subject to individual whims than she once supposed—the universities were generally receptive to her works and her desire to cultivate her status as a natural philosopher. When order was re-established after the Restoration, Cavendish relied on traditional institutions for the continued promotion of Aristotelian speculative natural philosophy. It was this very recognition that institutions exerted a great power over social, political, and intellectual life that led Cavendish increasingly to see the Royal Society as a serious challenge to the established order.

In the same year that Hooke's *Micrographia* appeared (1665), the Royal Society began to publish its *Philosophical Transactions of the Royal Society*, which Shadwell drew on with glee when writing *The Virtuoso*.⁸⁷⁶ In tension with Cavendish's selective and literary reflections on the discussions that took place during her time on the continent in *Sociable Letters* and *Philosophical Letters*, the early *Philosophical Transactions*

⁸⁷⁵ On the attempt to overcome confessional divides in the Republic of Letters, see the essays in *Die Europäische Gelehrtenrepublik im Zeitalter des Konfessionalismus* and Lambe, "Critics and Sceptics in the Seventeenth-Century Republic of Letters" (1988).

⁸⁷⁶ See Lloyd, "Shadwell and the Virtuosi" (1929) and Gilde, "Shadwell and the Royal Society: Satire in *The Virtuoso*" (1970).

primarily published pieces of natural history.⁸⁷⁷ Written years after the events occurred, the Cavendish's letters capture the themes of their discussions, in keeping with the broad notion of experience within the Aristotelian tradition but opposed to the emphasis on the description of specific events in the early *Philosophical Transactions*. While *The Blazing World* may be more concerned with satirising the Royal Society than presenting a positive vision of her utopian society, the fictional nature of Cavendish's reflections on courtly conversations implies that the Republic of Letters as she recalled it was something of a utopian fiction.⁸⁷⁸ But Cavendish most appreciated precisely the way that this environment fostered her fictional representation of philosophical conversations.

Cavendish's preferred label for the Republic of Letters was "the commonwealth of learning", and in *Observations* she regrets that those who "are not as earnest and active" in experimentation are "accounted unprofitable subjects to the commonwealth of learning" by thinkers in the early Royal Society.⁸⁷⁹ For this reason, she no doubt found it ironic when Samuel Tuke—an original FRS who published a history of the breeding of green Colchester oysters for the *Transactions*—wrote to Cavendish that her publications "improve your Heroick Spirit, and honour the Commonwealth of Letters".⁸⁸⁰ Yet the interests of such figures underscored the extent to which intellectual culture had shifted, with the Royal Society attracting much of the courtly "commonwealth". Cavendish still hoped to align natural philosophy with the literary in *Observations*, as she did in 1653. But she was fighting a losing battle. It is telling in this regard that she appended a piece of satire to her natural philosophical treatise, instead of integrating her philosophical

⁸⁷⁷ Hunter, *Establishing the New Science*, 22.

⁸⁷⁸ See Goldgar, *Impolite Learning* and Malcolm, *Aspects of Hobbes*, 437-545.

⁸⁷⁹ *Observations*, 51.

⁸⁸⁰ *Letters and Poems*, 101. For Tuke's history of green Colchester oysters, see Sprat, *History of the Royal-Society*, 307.

ideas into a self-consciously literary genre as she had previously done. Contrary to the suggestions of earlier narratives, this is because the story of the relationship between natural philosophy and literature was one of disintegration and estrangement rather than of new and closer bonds.⁸⁸¹ Cavendish's engagement with Shadwell and her republication of *Natures' Pictures* and *The World's Olio* attest to her continued engagement in intellectual life until her death. Even from the grave, William sought to solidify Margaret's legacy in relation to a particular vision of intellectual interactions by publishing her *Collection of Letters and Poems*. Used throughout this study, this publication was carefully selected to yield a vision not only of Cavendish but also of seventeenth-century intellectual life in which amateurs interacted amongst one another and with university figures on literary and philosophical topics.⁸⁸² Even so, it is almost certainly no coincidence that she ceased to publish natural philosophy right around the time that experimentation was dislodging its more literary and speculative instantiation.

For all her social concerns, Cavendish's opposition to the Royal Society must finally be ascribed to self-interest. This is in line with her philosophical precepts, for Cavendish argues in *Observations* that amongst all of Nature's activities "Perception and self-love are her prime and chief actions".⁸⁸³ Insofar as the interests of the Royal Society clashed with her own, Cavendish's antipathy to the Society could even be read as a dictate of nature itself.⁸⁸⁴ She held that the Republic of Letters—informally built on

⁸⁸¹ In regards to Cavendish, see the general argument of Sarasohn, *The Natural Philosophy of Margaret Cavendish*. More generally, see Preston, *The Poetics of Scientific Investigation in Seventeenth-Century England* (2016).

⁸⁸² For a relevant discussion of letter collections, see Clough, "The Cult of Antiquity: Letters and Letter Collections" (1976); *Self-Presentation and Social Identification: The Rhetoric and Pragmatics of Letter Writing in Early Modern Times*, ed. by van Houdt (2002); and Ray, *Writing Gender in Women's Letter Collections of the Italian Renaissance* (2009).

⁸⁸³ *Philosophical Letters*, 538.

⁸⁸⁴ On self-interest and public interest, see Krailsheimer, *Studies in Self-Interest: From Descartes to La*

social status and personal contacts—fostered the enlightened self-love that allowed for literary productions while placing communal restraints on potentially fractious discrepancies.⁸⁸⁵ Due to the social and elitist aspects of the Republic of Letters, it has been proposed that it could be more accurately called the *nobilitas litteraria*.⁸⁸⁶ Recognising that it was chiefly Royalists who both were in exile and a part of the Republic of Letters, Cavendish’s appeal to the Commonwealth of Letters seems to have been a witticism designed to indicate that the disruption of political life with the onset of the English Commonwealth only left them with a literary community. Akin to her postulation that there are different kinds of matter within one substance, we have seen that Cavendish believed that a monolithic social or political sphere best nurtured intellectual pluralism. By placing restraints on private interests and inviting individuals from a range of social backgrounds—while excluding Cavendish herself—she believed that the Royal Society could suppress not only harmful but also enlightened self-interest. Rather than uniting behind a mission to promote “physico-mathematical experimental learning”, the Republic of Letters was a loose cluster of thinkers with literary, scholarly, and philosophical concerns.⁸⁸⁷ Since Cavendish held that the Royal Society could narrow the range of endeavours, her self-interested critique of the Society certainly had an intellectual if not a social purpose.

Bruyère (1962) and Gunn, *Politics and the Public Interest in the Seventeenth Century* (1969).

⁸⁸⁵ Cf. Hintz, “‘But One Opinion’: Fear of Dissent in Cavendish’s *New Blazing World*” (1996), 34.

⁸⁸⁶ See Jaumann, “Introduction”, *Die Europäische Gelehrtenrepublik*, 11-19.

⁸⁸⁷ See Birch, *History of the Royal Society*, Vol. 1, 3.

Conclusion: After Natural Philosophy

Until recently, the likes of Hobbes, Descartes, and Boyle were generally taken at their word when they professed to thoroughly renounce the “Aristotelity” of the grammar schools and universities.⁸⁸⁸ Situating Cavendish in relation to these thinkers, scholars have also deemed her to have been an ardent anti-Aristotelian, despite the distinct absence of scorn towards Scholastic thought in her publications. While the last thirty years of scholarship following Schmitt’s seminal work have facilitated a much fuller understanding of early modern Aristotelianisms—even in relation to the *novatores*—this research has almost exclusively studied the university curriculums.⁸⁸⁹ Since Cavendish was not formally educated, it has been supposed that she remained unencumbered by these Scholastic fetters. Yet I have sought to demonstrate that Cavendish assimilated Aristotelian principles and categories as an antidote to the intellectual and religious turmoil of her times precisely because she stood outside of the universities and desired to forge contacts with eminent figures in Oxford and Cambridge.

In coming to terms with Cavendish’s natural philosophy, this dissertation has drawn attention to the many routes by which poet-scholars and amateur natural philosophers of the mid-seventeenth century could absorb Aristotelian-Scholastic ideas in the English vernacular. While Stanley applied his Greek learning to produce an impartial précis of Aristotle’s natural philosophy for a courtly audience—alongside the doctrines of other ancient sects—Cavendish was engaging with classical medicine and philosophy in the English vernacular prior to 1653 (two years earlier than the first edition of Stanley’s

⁸⁸⁸ See Hobbes, *Leviathan*, Vol. 4, ed. by Malcolm (2013), 1075.

⁸⁸⁹ See Des Chene, *Physiologia*; Ariew, *Descartes and the Last Scholastics*; and Leijenhorst, *The Mechanisation of Aristotelianism*.

History appeared). Using a method that is apparent in her early incorporation of material from Sandys' commentaries on *Metamorphoses*, she developed significant aspects of her philosophy by adapting the Aristotelian principles that were pervasive in the prefaces and notes of learned authors: those all-important places for early modern writers to justify and situate their arguments. Her idiosyncratic education and her publication of works written in diverse literary genres have led to some confusion among twenty-first and seventeenth-century writers alike. For instance, Grew grasped that Cavendish manipulated Aristotelian themes in *Philosophical and Physical Opinions*, but he recast her ideas in his commonplace book to better fit with the schemata of an Aristotelian *scala naturae*, as it would have appeared in an undergraduate textbook on natural philosophy. In doing so, he directed humanist note-taking practices to new ends, but he simultaneously offset Cavendish's endeavour to establish the courts as spheres in which Aristotelian natural philosophy could take on fresh forms.

Some of the most momentous sources for Cavendish's understanding of Aristotle were the English publications and translations of works by William Harvey and Meric Casaubon. Despite the fact that many figures in the early Royal Society shaped Bacon as an anti-Aristotelian, Cavendish also discerned numerous Aristotelian facets to his thought: he conceived of substance theories as fundamental to comprehending natural effects, emphasised the rational organisation of sensory data, and placed the knowledge of species above particulars. In addition to her more positive authorities, Cavendish engaged with thinkers such as Gassendi, Harriot, and van Helmont who summarised (and regularly misrepresented) Aristotelian ideas so as to critique them. It could be suggested that Cavendish was acquainted with Aristotelian notions chiefly through discussions

rather than textual evidence. but it seems that she increasingly turned to Aristotle after the Restoration, at which point she began to respond to printed material more explicitly. When Cavendish initially produced her atomic philosophy, she still inhabited a largely Latin world. But at this time she could track intellectual trends—even though one of her main influences, Gassendi, wrote in Latin—through conversations and the perusal of the few books available in English. After the Restoration, however, Cavendish found it ever more arduous to keep abreast of the rapid and often curious courses of experimental philosophy and natural history. As a result, her later treatises chiefly criticise the popular synopses of the Royal Society’s propagandists such as Hooke and Glanvill. Rather than illuminating seventeenth-century intellectual trends for non-specialists, the surge in English publications enabled Cavendish to steadily reconstruct the ancient and especially Scholastic background to recent philosophical developments.

In the settings of the household and courts, medical considerations perhaps provided the most immediately accessible conduit for Aristotelian and Galenic thought. While the extant historiography usually juxtaposes the approaches of Galenists and chymists, it has been shown that the intermixture of learned and chymical medicine was commonplace among figures both in the Royal College of Physicians and the courts.⁸⁹⁰ First inspired by the recipes and advice of the amateur Digby and the learned Mayerne, Cavendish subsequently culled medical and biological concepts from the translations of Harvey and van Helmont. Traditionally, physicians only examined other animals for the comparative purposes of maintaining or recovering human health. But Cavendish’s philosophical concerns guided her search for a substance theory that could explain the

⁸⁹⁰ See Rattansi, “The Helmontian-Galenist Controversy”; Webster, “English Medical Reformers”; and Hill, *The World Turned Upside Down*, 231-46.

sentience and intelligence of all animals and the functions of the natural world more generally. Primarily because she desired not to infringe upon the professional domain of learned medics, she came to endow all matter with life, producing a substance theory that closely resembles Glisson's "hylozoism". This intellectual kinship between Cavendish and Glisson underscores the degree to which a courtly thinker like Cavendish—engaging with vernacular sources—could access concepts that were similar to those deployed by the most learned and institutionally prominent figures of her day.

Meanwhile, Cavendish made inroads with major university figures such as Barlow, Creighton, and Mayne, and perhaps invited enough discussion to attract Fell's concern. The universities tolerated and even expressed appreciation for Cavendish's works during most of the 1650s and 1660s, and she reiterated her gratitude towards Oxford and Cambridge in both the dedications and the body of her publications. The only university figure against whom Cavendish brought substantial criticism was Henry More, and this was precisely because she considered his heterodox Platonic philosophy and cabalistic theology to undercut the very foundations of the institutions of which he was a part. Despite his place within the Church and the university, we have seen that More veered towards the fringe of seventeenth-century thought, making him a useful counterpoint in Cavendish's endeavour to align herself with the intellectual mainstream.

Even as she supported the universities, however, Cavendish believed that the skills required of an Aristotelian natural philosopher could be adequately or even best cultivated within the courts, which may have provided ample reason for Fell to question her allegiances. We have seen that experience and experiment slowly converged during the seventeenth century, with many thinkers in the early Royal Society coming to

redefine experience as that which individuals witnessed at a particular moment within a closed environment. By contrast, according to the more comprehensive Aristotelian notion of experience, one must use textual evidence and plain-sight observations to apprehend regular occurrences.⁸⁹¹ Working from the latter orientation, Cavendish held that playwrights should compare and abstract from their observations of many particular individuals in the courts to capture general humours or types. This corresponds with Harvey's interpretation of Aristotle whereby perceptions pass through the mind to supply knowledge of universals. Just as literary creations that fail to transcend individual idiosyncrasies could only ever represent morally impotent aberrations, a stress on preternatural creatures produced distorted outlooks on the natural world. In this regard, the scholarly insistence on Cavendish's singularity is inimical to her literary and philosophical principles.

In keeping with the early modern definition of "method" as synonymous with "order"—and following from her belief that the natural world functions as an orderly whole—Cavendish maintained that humans should observe and follow the motions of natural bodies rather than controlling them. It is only in this way that one could compose a truly (instead of artificially) ordered pieces of literature or natural philosophy.⁸⁹² Rather than a feminist opposition to the mastery of nature, Cavendish's belief that method follows the order of things originated in the Aristotelian view that natural philosophy is a science that searches for the most general causes of natural effects. These effects are contained in their causes, just as an acorn contains a tree. Inverting the common notion in seventeenth-century England that philosophy is a propaedeutic to the higher disciplines

⁸⁹¹ See Dear, *Discipline and Experience*, especially 124-50.

⁸⁹² See Jardine, "Keeping Order in the School of Padua".

of medicine, law, and theology, Cavendish considered natural philosophy to manipulate raw material from operative arts such as medicine, but to be nobler because its object was the universal.⁸⁹³ While Cavendish repudiated appeals to “form” or “soul”—which she deemed to be abstractions from matter—she drew on Harvey’s *De generatione* and van Helmont’s concept of *semina rerum* to form an Aristotelian methodology and teleological outlook on the natural world. In her early work she appealed directly to “spirits” and “seeds”, but she eventually coalesced all material effects into a single continuum of rational and sensitive substances. Since Cavendish coupled method and matter—and held that the human mind was material—she argued that the ways in which one thinks about substance can supply insights into the functions of matter itself. Conversely, an understanding of matter in motion can elucidate human thoughts and actions, which is another reason why Cavendish aligned the poet’s insights into humours and a philosopher’s outlook on the natural world.

Implicitly taking a Cartesian angle on the claims in some of Cavendish’s forewords that her natural philosophy is “new” or “of her own creation”, scholars have typically allied her with other proponents of philosophical novelty. Yet, whereas Descartes endowed the immaterial minds of humankind with a divine capacity for original creations, Cavendish deemed minds to be material parts of an infinite natural world within which nothing is created or destroyed. In keeping with her notion that all matter lies on a continuum, she held that philosophical knowledge continued unbroken from the ancients to the present, originally grounded in poetry and mythology. Any new concepts in her works are only original in the limited sense that they are based on the reconfiguration of previous conjectures towards different (but contiguous) ends. This

⁸⁹³ On the background to this view, see Schmitt, “Aristotle Amongst the Physicians”.

accords with the Aristotelian notion that the contemplative philosopher does not instigate or create anything, but enacts qualitative changes by re-arranging eternal matter.⁸⁹⁴ More than Aristotle's "original" ideas, Cavendish admired their capacity for perennial adaption.

Cavendish's works suggest that the vitality of Aristotelian philosophy arose from the continuity between its methodology and substance theory. We have seen that, as a substance theory, "pluralism" is the belief that the natural world is not simply made up of a homogenous matter. Cavendish was a substance pluralist since she held that the natural world is composed of a single substance, but that this could then be subdivided into rational, sensitive, and dull matter. A fundamental reason behind the tenacity of Aristotelian philosophy is that its substance theory is based on degrees of matter and subtle shifts, rather than the dichotomies of Plato and Epicurus: material and immaterial or matter and void. Even the eclectic and syncretic philosophies of the mid-seventeenth century were often wrought as reactions to Aristotelian pluralism. As we have seen, the more commonplace eclecticism was typified by both Gassendi's assimilation of manifold sources to render Epicurus more acceptable to the schools, and More's syncretic fusion of heathen philosophy with theology. Whereas Gassendi's Epicurean philosophy was conditioned and underpinned by his anti-Aristotelianism, Platonic syncretism was incompatible with the Aristotelian division of physics and metaphysics that was taken up in the Reformed tradition.⁸⁹⁵ "Eclectic" thinkers accordingly channelled the history of philosophy in their efforts to supplant Aristotle, while proponents of "pluralism" manipulated a wealth of ideas from within the Aristotelian tradition.

⁸⁹⁴ See Mikkeli, "The Foundation of an Autonomous Natural Philosophy".

⁸⁹⁵ On the later evolution of this notion, see Blackwell, "Sturm, Morhof and Brucker vs. Aristotle: Three Eclectic Natural Philosophers View the Aristotelian Method" (1997).

Even if Cavendish's pluralism challenged the notion of irreducible originality, her place in history arguably makes her the earliest English thinker to have composed a natural philosophy solely in the English vernacular. She appreciated the English language precisely because it is a multifaceted composite that mirrored her approach to the natural world. Recognising the importance of Cavendish's publications to the establishment of English as a formidable European language, the French philosopher, translator, and man of letters, Samuel Sorbière, documented in his *Voyage to England* that he brought on his journey "a Volume writ by the Marchioness of Newcastle along with me, by which, as also by Three other Volumes of the Poetical, Political, and Philosophical Works of this Lady, I was glad to make it appear in France, how much her Excellent Genius, Admirable Sence and Eloquence, abounded throughout the whole Composition".⁸⁹⁶ Sorbière travelled with Cavendish's books—no light task—and consulted them frequently not only due to the pleasure he derived from their content but also because he hoped that they would assist him in improving his English.

We have come some way towards appreciating this increased prominence of English by studying Sandys' and Stanley's translations, Grew's manipulation of humanist note-taking practices, and the English publications of even institutionally situated scholars such as Cudworth and Casaubon. Partly out of a desire to attract wealthy patrons from the courts, many thinkers in the Royal Society similarly published in English from the 1660s onwards. In opposition to this general trend, however, Cavendish began to actively solicit Latin translators for her work. While Peter Burke has shown that

⁸⁹⁶ Sorbière, *Voyage to England, containing many things relating to the state of learning, religion, and other curiosities of that kingdom* (London, 1709), 71 and *Letters and Poems*, 75. On Sorbière, see Sarasohn, "Who Was Then the Gentleman? Samuel Sorbière, Thomas Hobbes, and the Royal Society" (2004) and Malcolm, "Biographical Register", 893-9.

translations from the vernaculars to Latin were not uncommon during the early seventeenth century, these were certainly waning by the time *De vita* was published.⁸⁹⁷ Yet Cavendish was forced to realise that by publishing natural philosophy in the English vernacular she had contributed to a trend that both corroded the more cosmopolitan Republic of Letters, and challenged the authority of the universities by freeing a wider range of individuals to write natural philosophy. Cavendish was thoroughly inscribed in the Republic of Letters from the late 1640s until at least the early 1650s and was courted by the universities during the 1650s and early 1660s. Yet as English became more prevalent—and intellectual life ostensibly more inclusive—not only Cavendish’s ideas but speculative natural philosophy itself was sidelined.

As we have seen, Anstey argues that the distinction between experimental and speculative natural philosophy was predominant until the “first reception of Kant’s Critical philosophy”. But while it is useful for discussing the 1660s, such a division convolutes more than it elucidates moving into the latter half of the seventeenth century.⁸⁹⁸ It is true that thinkers continued to distinguish between the speculative and experimental, but these terms ceased to differentiate Aristotelian-Scholastic thought from the emergent understanding of experience and evidence. Contemporary scholarship has usually taken recourse in the rationalism/empiricism division to characterise the later movement. As ever, bifurcating the thought of a period into conflicting schools of thought is overly simplistic, and the distinction between rationalism and empiricism is especially deceptive since it is anachronistic.⁸⁹⁹ But the point for our purposes is that

⁸⁹⁷ See Burke, “Translation into Latin in Early Modern Europe” (2007).

⁸⁹⁸ Cf. See Anstey, “Experimental versus Speculative Natural Philosophy” and Anstey and Vanzo, “The Origins of Early Modern Experimental Philosophy”.

⁸⁹⁹ For a relevant historiographical discussion, see Lüthy, “What to do with Seventeenth-Century Natural

scholars usually align “speculative natural philosophy” with the rationalism of more radical figures on the continent such as Spinoza, Bayle, and Leibniz. Deviating from the traditions of Aristotelian thought, these thinkers were “metaphysical” system-builders of the post-Cartesian persuasion. The failure to discriminate rationalism and the earlier Aristotelian speculative natural philosophy has contributed to reading Cavendish as an anti-Aristotelian who was working from a Platonic or even Cartesian orientation.⁹⁰⁰

By contrast, so-called “empiricists” in Britain (traditionally discussed in terms of Locke, Berkeley, and Hume) stressed observational data. In a recent attempt to account for the emergence of this intellectual trend, it has been argued that Aristotelian logic inspired the empirical orientation of British thinkers around the turn of the eighteenth century.⁹⁰¹ Yet the nature of this Aristotelian legacy had changed, with the primary object of study being “human understanding” or “human nature”: a psychological focus that is dislocated from its traditional place as the culmination of investigations into the natural world.⁹⁰² Further, rather than being based on the interplay between sense and reason—with a stress on textual material as a source of experiential evidence—information obtained through the senses became the sole source of sound knowledge. Despite being indebted to the Aristotelian legacy, empiricism was thus estranged from Aristotelian physics as the search for causes that explain natural effects by speculating on the qualities and functions of the fundamental substances that compose plants, animals, and the wider world.

Philosophy?”.

⁹⁰⁰ See Wilson, “Two opponents of material atomism: Cavendish and Leibniz” (2007); James, “The Philosophical Innovations of Margaret Cavendish”; and throughout Cuning, *Cavendish*.

⁹⁰¹ See Sgarbi, *The Aristotelian Tradition*, but also the important cautions in Grant, “Medieval Natural Philosophy: Empiricism without Observation” (2002). On the other hand, see the historiographical introduction to and essays in *Cartesian Empiricism*, ed. by Dobre and Nyden (2013).

⁹⁰² See Serjeantson, “Human Understanding and the Genre of Locke’s *Essay*” (2008).

At the same time, Cavendish differs from the two other prominent late seventeenth-century natural philosophers who have sometimes been recognised for resisting the rationalism/empiricism distinction: Hobbes and Newton. Pointing to the plurality of Aristotelianisms, Hobbes and Newton (in their own ways) put much store by mathematics and quantitative, mechanical analysis as they laboured to retain Aristotelian *scientia*, whereas Cavendish explored the qualities and natures of not wholly predictable vital matter as a universal cause.⁹⁰³ Indeed, notwithstanding the fact that Scholasticism was sometimes associated with certainty and closed-systems, Aristotle stated that the “minute accuracy of mathematics is not to be demanded in all cases, but only in the case of things which have no matter”.⁹⁰⁴ In this again, Cavendish’s mediated reading practice thus veered her towards Aristotle since her study of substance did not lead her beyond probability to demonstrative and mathematical certainty.⁹⁰⁵ Her incredulity towards the possibility of achieving certain knowledge kept her closer to Aristotelian natural philosophy as a hermeneutic instead of mathematical enterprise, in which observational and textual data were corralled to arrive at general insights. Not only did this allow her to manipulate a variety of literary genres rather than making strict deductions, but, as was intimated in 4.3, this approach to the natural world is aligned with the Aristotelian notion

⁹⁰³ On Hobbes, see Jesseph, *Squaring the Circle: The War Between Hobbes and Wallis*, 189-246 and Lewis, “Francis Bacon and Ingenuity”, 28-30. Regarding Newton, see Guicciardini, *Isaac Newton on Mathematical Certainty*; Garrison, “Newton and the Relation of Mathematics to Natural Philosophy” (1987); and Feingold, “Mathematicians and Naturalists: Sir Isaac Newton and the Royal Society” (2001). Dmitri Levitin has recently questioned the degree to which Newton was influenced by Aristotelian ideas and especially causation: see “Newton and Scholastic Philosophy” (2016).

⁹⁰⁴ Aristotle, *Metaphysics*, II, 995a15-17; translation from Ross, *Aristotle’s Metaphysics*, 21.

⁹⁰⁵ On Aristotle as sometimes being directed towards mathematical ends, see Dear, *Discipline and Experience*, and, for the background, Cleary, *Aristotle and Mathematics: Aporetic Method in Cosmology and Metaphysics* (1995).

of poetry, according to which poets can abstract from historical events and natural observations so long as they remain within the circumference of the probable.⁹⁰⁶

In the final analysis, rather than coming down to her “madness”, Cavendish has proven difficult to place because she was part of an intellectual tradition that scholars have either overlooked or deemed all but non-existent by the time that she published. Her defiance of the categories that are usually implemented to structure late seventeenth-century thought should compel us to question their historical utility as they are often rigidly conceived, instead of to attempt and fit Cavendish within them. As we have seen, taking recourse in her eccentricity or singularity is not a solution, if only for the reason that it conflicts with her philosophical principles. Due to the inherent pluralism of the Aristotelian traditions, understanding Cavendish as an Aristotelian need not foreclose hermeneutic possibilities, but could rather foster a multiplicity of ways to understand her philosophy in relation to a longstanding interpretive tradition. In this sense, I have not advocated a pendulum swing from seeing Cavendish as singular to understanding her in relation to a single sect, but have instead underscored the plurality of possibilities that arise from an appreciation of the deeply historical and well-established notions of “originality” and “newness” with which she was working.

As the above points of reference suggest, the traditions of Aristotelian thought were of continued consequence into the latter half of the seventeenth century. But the use of the Aristotelian distinction between physics and metaphysics to create an autonomous sphere for speculative natural philosophy—with its emphasis on the balance between sense and reason, studying natural causes, and the qualitative gradations of vital substances—was of a particular historical moment. I have argued that Cavendish’s

⁹⁰⁶ See Aristotle, *Poetics*, 51a12-13.

natural philosophy did not so much resemble that of Hobbes as Harvey and especially Glisson. Yet even Glisson developed his speculative natural philosophy for practical and ultimately experimental, medical ends, whereas Cavendish abstracted material from the medical tradition to form a natural philosophy that would not directly impinge upon learned medics. Glisson made his medical goals clear by stating that *De ventriculo*—his 1677 publication on the stomach and intestines—was written in 1662 but held from the press until he “could produce and bring into the light another Treatise, forerunner to this, on the Life of Nature”, or *De natura substantiae energetica*.⁹⁰⁷ Perhaps even more tangibly, Grew demonstrates how thinkers after the 1660s took Aristotelian notions in a different direction. On the one hand, Grew channelled Aristotelian precepts to develop his experimental philosophy, and especially to establish the plant sensitivity that underpinned his comparative anatomy. But, on the other hand, his work of physico-theology manipulated Aristotelian ideas for the scholarly purpose of corroborating his proofs for God’s existence. For all Cavendish’s defiance, this is representative of a division that formed more generally: practising philosophers experimented, while scholars and theologians studied speculative philosophy historically.⁹⁰⁸

As this split surfaced, Cavendish’s use of the history of philosophy to shape her own speculative natural philosophy in verse, essays, and letters not only became unpalatable but incomprehensible. The irony is of course that the circulation of Gassendian ideas and principles within the courtly setting led Cavendish to fully appreciate the close relationship between literature, philosophy, and learning. But the

⁹⁰⁷ See Henry, “Medicine and Pneumatology”, 20; quotation translated from Glisson, *Tractatus de ventriculo et intestinis* (London, 1677), A3r.

⁹⁰⁸ See the conclusion of Levitin, *Ancient Wisdom*, 547-8; Wallace, “Traditional Natural Philosophy”; and Feingold, ““Experimental Philosophy””; and Lüthy, Leijenhorst, and Thijssen, “The Tradition of Aristotelian Natural Philosophy”, especially 2-3.

refraction of Gassendi's anti-Aristotelianism among figures in the early Royal Society also sparked the dissolution of the Aristotelian traditions that allowed for such ideas to subsist. Cavendish finds in Stanley a figure who took Gassendi's perspective on the relationship between literature and learning seriously without forwarding his own philosophical agenda based on the defence of a single school. But precisely because Stanley approached speculative natural philosophy historically, the reception of his *History* was divided between scholars who consulted it as a guidebook for chronological information and textual emendations, and practising experimental philosophers who understood it to expose the cultural and intellectual baggage that could hinder their endeavours. All things considered, any idiosyncrasy in Cavendish's thought can be accounted for by her unfashionable decision to assume the status of a speculative natural philosopher at a time when it was quickly becoming a historical preserve. While she was the first thinker to compose her natural philosophy solely in English, she may very well have been the last thinker to produce a speculative natural philosophy in England.

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