

Introduction

The Other Voice

Margaret Lucas Cavendish (ca. 1623–1673) developed a singular philosophical voice among her peers in seventeenth-century England. She was not only an ardent student of the natural world and the various theories of its powers and forms but also a keen literary assayer whose works span several genres of the English literary universe (she wrote poems and essays, plays and orations, epistolary philosophy and science fiction, romance and political parody, biography and memoir). Indeed, even within the covers of her first published book, *Poems and Fancies* (London, 1653), that lively range of generic variety is on full display, mirroring her omnium-gatherum approach to poetry and science. Cavendish went on to pen eleven more books for print publication, several of which were committed to refining a complex, multifaceted theory of matter, perception, and human nature. That she did so with such astonishing literary versatility makes her voice an especially valuable addition to the canons of literature, philosophy, and the history of science.¹

Positive responses to Cavendish's first verse foray into natural philosophy were not lacking. Constantijn Huygens—renowned Dutch statesman and philosopher, and friend of René Descartes, John Donne, and Anna Maria van Schurman—pronounced *Poems and Fancies* “A wonderful book, whose extravagant atoms kept me from sleeping a great part of last night in this my little solitude.”² Gerard Langbaine gave a similar assessment in *An Account of the English Dramatick Poets* (1691), declaring Cavendish “a Lady worthy the Mention and Esteem of all Lovers of Poetry and Learning.”³ Her writing piqued the curiosity of learned men, many of whom corresponded with Cavendish about contemporary issues in natural philosophy, and their missives were included in a posthumous book published by her husband William.⁴ That volume tracks several years of her

1. See James Fitzmaurice, “Cavendish, Margaret, Duchess of Newcastle upon Tyne (1623–1673),” *ODNB* and David Cuning, “Margaret Lucas Cavendish,” *SEP*.

2. Constantijn Huygens, *De Briefwisseling van Constantijn Huygens (1608–1687)*, ed. J. A. Worp (The Hague: Rijks Geschiedkundige Publicatiën, 1911–17), 5:186, cited in Whitaker, 170. For longer discussions of Cavendish's relationship with Huygens, see Whitaker, 169–71, and Nadine Akkerman and Marguerite Corporaal, “Mad Science Beyond Flattery: The Correspondence of Margaret Cavendish and Constantijn Huygens,” special issue, *Early Modern Literary Studies* 14 (May 2004): 2.1–21.

3. Gerard Langbaine, *An account of the English Dramatick poets; or, Some observations and remarks on the lives and writings of all those that have publish'd either comedies, tragedies, [etc.] ... in the English tongue* (Oxford: L. L., 1691), 390.

4. In the seventeenth century, “natural philosophy”—a term borrowed from Aristotle—referred to the branch of learning that dealt with the examination of the phenomena of the natural world. Natural

2 Introduction

lively engagement with natural philosophers such as Joseph Glanvill, Constantijn Huygens, and Walter Charleton, as well as with personal friends or family retainers such as Leonora Duarte or Mark Anthony Benoist.⁵ Cavendish did not, in short, develop her ideas in isolation.

Cavendish's voice is especially significant as that of the earliest English female poet to advance her own detailed theory of matter in print: her *Poems and Fancies* enthusiastically took up elements from the Epicurean model of atomism and adapted them to her own theory of intelligent, self-organizing matter.⁶ Revived from classical Greek philosophy, atomism posited a cosmos composed of indivisible, indestructible "seeds" or "atoms" of matter, and the world's diversity—including minerals, plants, animals, and humans—could be explained by the clustering of minute particles into distinctive forms; changes in nature were thus understood to be the result of changes in atomic configuration. Cavendish agreed with much of this but modified her particle theory by insisting that all matter is infinitely divisible and by versifying sustained elaborations on atomism in relation to the newly emerging math of algebraic geometry—a science of infinitesimals and probabilities that formed the rich soil out of which Newton and Leibnitz would, as assiduous gardeners of curvature, time, and comparable infinities, eventually harvest the astounding fruit of calculus.⁷ Indeed, through striking imagery, Cavendish's *Poems and Fancies* made ideas from Euclid, Archimedes, and Lucretius both accessible and enjoyable to a wide variety of contemporary readers, an audience that included accomplished mathematicians and scientists among the Cavendish family's circle of friends, as well as readers whose interests were more prosaic—focused, for instance, on the arts of cookery (popularly associated with chemistry) or animal husbandry (commonly linked to theories of biology). In this regard, Cavendish's volume offers a witty, entertaining primer on the manifold parts and powers of nature: atomic motion and form, biological regeneration and disintegration, magnetic pull and repulse, planetary motion and tidal patterns—all are probed with

philosophy thus included biology, physics, astronomy, and other categories of thought we now associate with science.

5. See *A Collection of Letters and Poems Written by Several Persons of Honour and Learning, upon Diverse Important Subjects, to the Late Duke and Dutchess of Newcastle* (London: Langly Curtis, 1678), 165–70. An earlier edition appeared as *Letters and Poems in Honour of the Incomparable Princess, Margaret, Dutchess of Newcastle* (London, 1676).

6. See David Cunning, "Cavendish on the Intelligibility of the Prospect of Thinking Matter," *History of Philosophy Quarterly* 23, no. 2 (2006): 117–36.

7. For a clear delineation of the various stages that would make Newton's and Leibniz's development of calculus possible later in the century, see Ivor Grattan-Guinness, *The Rainbow of Mathematics: A History of the Mathematical Sciences* (New York: W. W. Norton, 2000), 174–301. Cavendish was not a major influence on mathematical science, but her poems are saturated with the questions being raised by those who were.

playful delight. At the same time, those poems lamenting humanity's cruelty in the ecology of nature show painterly attentiveness to the details of a hare's or a hart's (or even a tree's) fierce yet futile determinations to hold off death; still, even as she granted the darker aspects of such suffering, Cavendish consistently proffered a celebration of life and a vindication of nature's generative virtuosity. Her later publications continued to explore these diverse topics in science and philosophy, sometimes reaffirming—but often directly challenging—the propositions of prominent thinkers of England and Europe.⁸

While experimenting with literary genres and developing complex theories of matter and perception, Cavendish was quite conscious of herself as a female author. Throughout her career, she regularly defended female education and critiqued women's poor legal and political status. She was well aware of the perils of displaying her intelligence and ambition on the public stage of print: "But I imagine I shall be censured by my own sex; and men will cast a smile of scorn upon my book because they think thereby women encroach too much upon men's prerogatives," she writes in *To All Noble and Worthy Ladies*, part of the preface to *Poems and Fancies*, "for they [men] hold books as their scepter, by which they rule and govern." A decade later, in her science-fictional romance *The Blazing World*, she expressed the desire to make a conquest of all her readers, claiming that a woman could rule in literary realms as well as any man: "By this poetical description, you may perceive, that my ambition is not only to be Empress, but Authoress of a whole world ... [which was] more easily and suddenly effected than the conquests of ... Alexander and Caesar."⁹ Although she asserts the power of her mind's suzerainty in the literary imperium, in a final flourish, Cavendish announces the emancipation of imagination, explaining how the shared world of reality is also always a layered world of imagined possibilities, and she advises her readers that they, too, may "create worlds of their own."¹⁰ In short, when Cavendish asserted her own voice in print, she modeled—and sounded a call for—the creative endeavors of male *and* female voices in the making of reality-shaping literary and philosophical worlds.

8. For insightful extended studies in this regard, see Lisa T. Sarasohn, *The Natural Philosophy of Margaret Cavendish: Reason and Fancy during the Scientific Revolution* (Baltimore: Johns Hopkins University Press, 2010) and Lisa Walters, *Margaret Cavendish: Gender, Science, and Politics* (Cambridge: Cambridge University Press, 2014).

9. Margaret Cavendish, *The Description of a New World, Called the Blazing World*, ed. Sara H. Mendelson (Peterborough, Ontario: Broadview Press, 2016), 163–64. Hereafter, *Blazing World*.

10. Cavendish, *Blazing World*, 163–64.

The Life of Margaret (Lucas) Cavendish

Margaret Lucas was born in 1623 at St. John's Abbey in Essex. She did not begin life as a titled aristocrat, a point she is at pains to stress in her autobiography: her father, Thomas Lucas, "was a gentleman, which title is grounded and given by merit and not by princes; and 'tis the act of time, not favor."¹¹ They were wealthy, she tells us, for "there were few peers who had much greater estates, or lived more noble therewith."¹² Thomas had been banished by Elizabeth I for killing another man in a duel of honor, and while he was exiled in France, his future wife gave birth to their eldest (but illegitimate) son, Thomas.¹³ Once Lucas was allowed to return to England, the two were married, producing seven more offspring, of which Margaret was the youngest. Elizabeth Leighton Lucas was already a widow by the time Margaret was two years old, taking on the duties of preserving and securing the family assets while the oldest legitimate son, John, was still a minor.¹⁴ The portrait Margaret paints of her mother, much like that of her father, is of a staunch loyalist of natural, if not titled, nobility.¹⁵

Cavendish claims that she enjoyed a happy, carefree childhood in which the impulse toward authorship was already evident in the many "baby books" she penned in her youth. But this idyll abruptly came to an end in 1642, when civil war broke out; forced to move, the Lucas family went first to Whitehall, then on to Oxford, a royalist stronghold where the court temporarily resided. There Cavendish heard of Queen Henrietta Maria's military exploits as the "she-majesty generalissima over all" in aid of her husband, King Charles, and enthralled by stories of the Queen's courage and military daring, Cavendish aimed at becoming

11. Margaret Cavendish, *A True Relation*, in *Natures Pictures Drawn by Fancies Pencil to the Life* (London: J. Martin and J. Allestrye, 1656), 368–69. Several modern biographies provide additional details of Margaret's life. The most thorough is Whitaker, noted above; see also Kathleen Jones, *A Glorious Fame: The Life of Margaret Cavendish* (London: Bloomsbury, 1988); Douglas Grant, *Margaret the First* (London: Rupert Hart-Davis, 1957); and Henry Ten Eyck Perry, *The First Duchess of Newcastle and Her Husband as Figures in Literary History* (Boston: Ginn and Co., 1918). Other sources with a strong biographical orientation include Mihoko Suzuki, "Gender and the Political Imaginary," in *Subordinate Subjects: Gender, the Political Nation, and Literary Form in England, 1588–1688* (Burlington, VT: Ashgate, 2002); Emma Reese, *Margaret Cavendish: Gender, Genre, Exile* (Manchester: Manchester University Press, 2003); Anna Battigelli, *Margaret Cavendish and the Exiles of the Mind* (Lexington: University Press of Kentucky, 1998); and Sara Heller Mendelson, *The Mental World of Stuart Women: Three Studies* (Brighton: Harvester, 1987).

12. *TR*, 368.

13. *TR*, 368–69.

14. *TR*, 369.

15. *TR*, 377.

a maid of honor.¹⁶ Her successful appointment was probably aided by the court connections of her older sisters and by the fact that the Queen was short handed during her dangerous adventures.¹⁷

By 1644, Henrietta Maria had led her court into exile in her native France. Having followed the Queen to Paris, Margaret Lucas met and was wooed by the royalist commander William Cavendish (then Marquis of Newcastle), who had recently lost the crucial battle of Marston Moor (1644) and fled to exile in France.¹⁸ A famous courtier, an authority on the art of horsemanship, a generous patron of poets and playwrights, and an author in his own right, William courted her in verse intentionally reminiscent of John Donne's erotic poems.¹⁹ Margaret's responses were initially guarded but soon became encouraging while remaining wittily circumspect: "My lord, I have not had much experience of the world ... But since I knew you, I fear I shall love it too well because you are in it. Yet methinks you are not in it because you are not of it. So I am both in and out of it, a strange enchantment."²⁰ William was thirty years her senior with adult children of his own, a fact that Cavendish appears to have interpreted as grounds for an enduring and stable relationship, and in December 1645, despite opposition by Henrietta Maria, the two were wed in a modest ceremony at the English ambassador's private chapel.²¹ Marriage to William had a profound effect on Cavendish's career as a

16. Accounts of the Queen's daring exploits were published broadly. For a good overview of the life of Henrietta Maria, see Caroline M. Hibbard, "Henrietta Maria (1609–1669)," *ODNB*. The first biography of Henrietta Maria was by John Dauncey, *The History of ... Henrietta Maria, Queen of England* (London, 1660). For an example of a newsbook depiction, see *Mercurius Britannicus*, April 29–May 6, 1644, 265–66, and for the "generalissima" reference, see *Letters of Queen Henrietta Maria Including her Private Correspondence with Charles the First*, ed. Mary Anne Everett Green (London: Richard Bentley, 1857), 222.

17. On her desire to serve the Queen, see *TR*, 372–73, where she also stresses the advantageous marriages of her older siblings.

18. See Lynn Hulse, "Cavendish, William, first duke of Newcastle upon Tyne (*hap.* 1593, *d.* 1676)," *ODNB*.

19. See, for instance, William Cavendish, "Loves Thoughts," in *Sociable Letters*, ed. James Fitzmaurice (Toronto: Broadview, 2004), 303–4. The poems and letters exchanged between William and Margaret are included in the Fitzmaurice edition as "Appendix A: The Context of Family." Letters from Margaret to William may also be found in *Letters of Margaret Lucas to Her Future Husband*, ed. Richard Goulding (London: John Murray, 1909). For a good discussion of Donne in the writing of Margaret and William Cavendish, see Lara Dodds, *The Literary Invention of Margaret Cavendish* (Pittsburgh, PA: Duquesne University Press, 2013), 57–92.

20. Margaret to William, *Sociable Letters*, 297–98. The originals of her letters to William are located in the British Library's Portland Collection.

21. For Cavendish's thoughts on William's age, see *TR*, 375. For hints at engagement difficulties, see Margaret's letters to William. In one she writes, "My Lord, I hope the Queen and I are friends. She sayeth she will seem so, at least, but I find if it had been in her power, she would have crossed us." See Margaret to William in *Sociable Letters*, 301.

writer, for the relationship provided two crucial elements she might not have had otherwise: association with a group of affiliated mathematicians, philosophers, and scientists (now commonly referred to as the Cavendish Circle) and robust mentoring by William and his younger brother Sir Charles, men whose status in the world of science virtuosi enabled them to offer the intellectual stimulus she actively sought.²² In fact, despite the culture's discomfort with women publishing on nonreligious topics, Cavendish's husband made his approval of her endeavors clear by furnishing her published volumes with commendatory verses. While in France, Cavendish absorbed the ideas of her husband's guests, sometimes recapitulated for her by William or Charles, including Thomas Hobbes, René Descartes, Pierre Gassendi, Marin Mersenne, and Gilles Personne de Roberval, among others.²³ Indeed, her ambition to create her own theories germinated swiftly in those evenings of wine and conversation, and it was not long after learning more of Gassendi's discourse on Lucretius that she put pen to paper.²⁴

Charles I was executed in 1649 and a commonwealth (government without a king) declared; however, the commonwealth lasted until 1653 when a new "Protectorate" was instituted under the rule of Oliver Cromwell. Charles II moved the exiled English court to The Hague in hopes of gaining substantial aid from his sister Mary and brother-in-law William II, Prince of Orange; he later settled in Bruges. The Newcastle household followed a similar trajectory from France to the Spanish Netherlands, first moving from Paris to Rotterdam, then to Antwerp, where the couple rented the home of past painter and diplomat Peter Paul Rubens.²⁵ There, living in one of the most diverse commercial centers of Europe, Cavendish encountered a wide variety of peoples and customs. Reminiscing later about Antwerp while composing the biography of William, she painted the city in glowing colors: merchants courteously extended credit, neighbors were engaging

22. For more on Charles, see E. I. Carlyle, "Cavendish, Sir Charles (1595?-1654)," rev. Timothy Raylor, *ODNB*.

23. The contemporary biographer John Aubrey wrote, "I have heard Mr. Edmund Waller say that W. Lord Marquis of Newcastle was a great patron to Dr. Gassendi and M. Des Cartes, as well as to Mr. Hobbes, and that he had dined with them all three at the marquis's table at Paris." See John Aubrey, *Letters Written by Eminent Persons ... by John Aubrey, Esq.* (London: Longman, 1813), 2:602.

24. Gassendi's views on atomism were well known thanks to his extensive correspondence with Charles Cavendish and others. Additionally, Gassendi edited, translated, and published a major source for Epicureanism, *Investigations into the Tenth Book of Diogenes Laertius* (1649); his own *Treatise on Epicurean Philosophy* was included in that volume. Cavendish family friend Walter Charleton published his translation of Gassendi's *Investigations* in 1654. See Walter Charleton, *Physiologia epicuro-gassendo-charltoniana; or, A fabrick of Science Natural, upon the Hypothesis of Atoms Founded by Epicurus* (London: Thomas Newcomb, 1654).

25. For a good introduction to the Rubenshuis in this context, see Ben van Beneden and Nora de Poorter, *Royalist Refugees: William and Margaret Cavendish in the Rubens House, 1648-1660* (Antwerp: Rubenshuis & Rubenianum, 2006). The Cavendish family rented from Rubens's widow.

and kind, and citizens in general were “the civilest and the best behaved people that ever I saw.”²⁶ Lodged comfortably in the Rubenshuis, she befriended Leonora Duarte and her sisters, daughters of the wealthy crypto-Jewish couple Gaspar and Catharina Duarte, a relationship that would endure the rest of her life.

In November 1651, Cavendish accompanied her brother-in-law Charles to London to petition Parliament for her spousal one-fifth portion of Newcastle’s confiscated estate. The business of petitioning was characterized by long delays, tedious legal wrangling, further delays, and the growing suspicion that her mission would not be successful. As Cavendish explained, “I found their hearts as hard as my fortunes ... for they sold all my Lord’s estate ... and gave me not any part thereof ... which few or no other was so hardly dealt withal.”²⁷ *Poems and Fancies* was hastily pulled together during this stressful period before her return to Antwerp in early 1653. Despite the strain of dealing with Parliament, Cavendish enjoyed pleasurable social engagements during her time in London, for she fared forth several times to Hyde Park with her sisters “to take the air,” attended concerts, visited other relations, and invented “singular” new fashions to please herself “and those I went to visit.”²⁸ With no household to run while she was away from William, Cavendish pursued a rigorous course of reading and self-instruction, aided by her London companion, Charles—a program that quickly metamorphosed into her first published book as well as drafts of *The World’s Olio* and *Philosophical Fancies*. In fact, *Poems and Fancies* took shape as a kind of intellectual cartography as Cavendish carefully mapped for herself a view of the scientific terrain: she read treatises on travel and exploration to get a sense of the span of the natural world (including works by Raleigh, Hakluyt, and Purchase), and in an effort to more fully grasp the minutia of nature’s forms and functions, she sampled works by Euclid, Aristotle, Lucretius, Dee, Galileo, Descartes, Hobbes, and many others. Charles was generous and helpful in these endeavors, earning pride of place as the person to whom she dedicated her first published books, *Poems and Fancies* and *Philosophical Fancies*. Her early memoir, *A True Relation*, penned not long after Charles’s death in 1654, is in part aimed at recording her debt to him, “whose favors and my thankfulness, ingratitude shall never disjoin, for I will build his monument of truth—though I cannot of marble—and hang my tears as escutcheons on his tomb.”²⁹

Cavendish chose to publish her work as a printed book under her own name rather than as a manuscript to be circulated among a smaller coterie of family and friends—an intrepid determination given her own prediction regarding the book’s

26. *Life of William*, 2.65.

27. *TR*, 397. For further details of her encounters with Parliament, see *TR*, 379–80. For a more detailed account of this experience in the larger context of Parliamentary proceedings, see Whitaker, 133–59.

28. See *TR*, 382, 387.

29. *TR*, 378.

probable negative reception. It may seem surprising, then, that in the preface to *Poems and Fancies* Cavendish intentionally invokes the scandal surrounding the publication of Lady Mary Wroth's *Urania* (1621), quoting Lord Denny's scathing criticism: "Work, lady, work; let writing books alone, / For surely wiser women ne'er wrote one."³⁰ Wroth's book had included a negative depiction of Denny, and he promptly wrote a poem excoriating Wroth as a "hermaphrodite" and "monster." In turn, Wroth's spirited reply, "Railing Rimes Returned upon the Author," was witty and unrepentant: "Hirmophradite in sense in Art a monster / As by your railing rimes the world may conster / Your spitefull words against a harmless booke / Shows that an ass much like the sire doth looke." In other words, despite a nod to the trope of authorial humility, Cavendish was not tiptoeing into her first print foray: she gives Wroth the stage, and in opposition to Denny's booming harangue, Cavendish steps up beside the heroine-author to urge her female readers, "Therefore, pray strengthen my side in defending my books, for I know women's tongues are as sharp as two-edged swords and wound as much when they are angered ... So I shall get honor and reputation by your favors."³¹ In short, she urged women to be her allies and, rather than impugn the book themselves, use their verbal weapons against potential male attackers.

Evidence of the contemporary response to the first edition of *Poems and Fancies* is scant: in addition to Constantijn Huygens's delighted remarks, Mildmay Fane, Second Earl of Westmorland, also thought highly of the volume.³² But there were contemporaries who were sharply critical. Writing in April 1653 to her future husband, William Temple, Dorothy Osborne asks whether he has yet seen "a book of Poems newly come out, made by my Lady New Castle. for God sake if you meet with it send it mee, they say tis ten times more Extravagant then her dresse."³³ Osborne, best known for her witty letters to Temple, does not address

30. For a more detailed discussion of Wroth's public skirmish with Denny, see the introduction to *The Poems of Lady Mary Wroth*, ed. Josephine A. Roberts (Baton Rouge: Louisiana State University Press, 1983), 31–36. The poems that make up Wroth's and Denny's heated exchange are included there.

31. Pertinent to Cavendish's authorial identity is Wroth's emphasis on merit and ability as "more important than either rank or wealth in the *Urania*." See Josephine A. Roberts, "Lady Mary Wroth's *Urania*: A Response to Jacobean Censorship," in *New Ways of Looking at Old Texts: Papers of the Renaissance English Text Society, 1985–1991*, ed. W. Speed Hill (Binghamton, NY: Medieval & Renaissance Texts and Studies, 1993), 125–29.

32. See his comments in Mildmay Fane, *The Poetry of Mildmay Fane, Second Earl of Westmorland: Poems from the Fulbeck, Harvard, and Westmorland Manuscripts*, ed. Tom Cain (Manchester: Manchester University Press, 2009), 292, 316–18. See also Stephen Wright, "Fane, Mildmay, second earl of Westmorland (1602–1666)," *ODNB*.

33. Dorothy Osborne, Lady Temple, was a royalist who later garnered fame when in 1671 she aided Charles II in provoking the Third Anglo-Dutch War: she sailed the royal yacht through the Dutch fleet, demanding obeisance. See Kenneth Parker, "Osborne, Dorothy [*married name* Dorothy Temple, Lady Temple] (1627–1695)," *ODNB*.

the merit of Cavendish's volume, which she has not yet seen. Instead, she condemns the impropriety of Cavendish publishing at all: "Sure the poore woman is a little distracted, she could never bee soe ridiculous else as to venture at writieing book's and in vers too."³⁴ In a subsequent letter, Osborne reports that she had "seen" the book and was "satisfyed that there are many soberer People in Bedlam, i'le swear her friends are much to blame to let her goe abroad."³⁵ Osborne's is the response most frequently quoted by scholars in terms of contemporary perceptions regarding the book's extravagance. However, it is difficult to ascertain just how representative Osborne's response was: other than Huygens's and Fane's enthusiastic comments—and several positive responses to Cavendish's oeuvre from friends and philosophical correspondents in later years—no other contemporary mention of the first edition has been found.

Three years after *Poems and Fancies* appeared, Cavendish published *A True Relation* (1656) partly to counter two contradictory accusations: philosophical plagiarism on the one hand, and immodesty for flaunting her intellect on the other. Her vigorous self-defense suggests she felt harried by such complaints during the years between the publication of *Poems and Fancies* and the release of *A True Relation*.³⁶ This odd situation (in which Cavendish must defend her books as her own work while negotiating the question of propriety) helps to account for the equally odd disjunctions in her autobiography: on the one hand, she depicts herself as a shy, little-read, modest, and retiring writer who preferred the solitude of her closet. On the other hand, she offers accounts of bold enterprises such as confronting Parliament, parading daring new fashions at public gatherings, and engaging with internationally renowned philosophers on questions at the core of both moral and natural philosophy. Managing the need for social circumspection

34. Osborne, *The Letters of Dorothy Osborne to William Temple*, ed. G. C. Moore Smith (Oxford: Clarendon, 1928), 37. Composing, as Osborne confesses, despite "all the Ale" and what she describes as a vision-blurred fog of inebriation, she nevertheless is at pains to distance herself from the unseemliness of the public display of a lady's private "fancies," even as she expresses an eager curiosity to read them for herself. Carrie Hintz points out that although "Osborne preferred private, intimate forms of communication," her letters reveal "her to be as outspoken as Cavendish." See Hintz, *An Audience of One: Dorothy Osborne's Letters to William Temple, 1652–1654* (Toronto: University of Toronto Press, 2005), 5.

35. Osborne, *The Letters of Dorothy Osborne to William Temple*, 41. A year later, Osborne would respond to Temple's reproaches regarding her preoccupation with reputation by pointing out that women were especially vulnerable in this regard. A reputation once lost could not be recovered, not even by "my Lady New Castle with all her Philosophy." See *Dorothy Osborne, Letters to Sir William Temple, 1652–1654: Observations on Love, Literature, Politics, and Religion*, ed. Kenneth Parker (Burlington, VT: Ashgate, 2002), 177.

36. See Cavendish, "An Epistle," in *Nature's Pictures*, 363–67, which serves as the preface to the memoir that immediately follows.

in relation to her oft-repeated desire to achieve an enduring fame would prove to be a rhetorically complicated task throughout her writing career.³⁷

Cavendish continued writing and publishing during her time in Antwerp, and after the restoration of the monarchy in England, carried on as an author when the couple returned to their native land in 1660. Of course, writing was not her only occupation. As the 1660s progressed, Cavendish followed the capable example of her now-deceased mother: she steadily increased her participation in managing the Newcastle estates (prudently augmenting her own jointure several times), and by 1668 had helped to re-evaluate and regularize the collection of rents.³⁸ In fact, her interest in money matters emerged early in the marriage: apparently, it was her idea to go with Charles to London in the first place, “For I hearing my lord’s estate was to be sold, and that the wives of the owners should have an allowance therefrom ... over I went.” As her stay continued, she personally petitioned at Goldsmiths Hall and regularly went to Drury House “to inquire how the land was sold.” Moreover, after the family returned to England, her pragmatism in finance led her to argue publically that William ought to receive recompense for the financial blows he had suffered for the sake of the Crown.³⁹ In short, while continuing to develop her philosophical inquiries and experiments in literary form, Cavendish also helped supervise the Newcastle estates, even going so far as to publish what amounted to an invoice to the government as part of William’s biography. However fanciful her poems, she was a pragmatist in matters of property.

Writing philosophy and managing property took place in a social context of celebrity and attendant popular scrutiny. After William was made Duke of Newcastle in 1665, the couple’s occasional visits to London (where they appeared at Charles II’s court, attended plays, and enjoyed other entertainments) aroused considerable popular interest. Diarist Samuel Pepys, for instance, spent days

37. For an insightful discussion of the rhetorical strategies behind the various postures of humility Cavendish takes, see Margaret Reeves, “Writing to Posterity: Margaret Cavendish’s ‘A True Relation of my Birth, Breeding, and Life’ (1656) as an ‘autobiographical *relazione*,’” *Renaissance and Restoration* 34, no. 1–2 (2011): 183–206. See also Hero Chalmers, “Dismantling the Myth of ‘Mad Madge’: The Cultural Context of Margaret Cavendish’s Authorial Self-Presentation,” *Women’s Writing* 4, no. 3 (1997): 323–39 and Line Cottagnies, “The ‘Native Tongue’ of the ‘Authoress’: The Mythical Structure of Margaret Cavendish’s Autobiographical Narrative,” in *Authorial Conquests: Essays on Genre in the Writing of Margaret Cavendish*, ed. Line Cottagnies and Nancy Weitz (London: Associated University Presses, 2003), 103–19.

38. A jointure was the provision for a wife after the death of her husband, including lands or tenements, for the rest of her life. See *TR*, 380 and 379 for further details.

39. By the time she penned the biography of her husband in 1667, Cavendish had worked out a full roll of the revenues lost during the fifteen years she and William were in exile. See *Life of William*, 92–107. See also Whitaker, 321–23.

pursuing her coach around the city in hopes of catching a glimpse of her.⁴⁰ In York in 1665, Sir Charles Lyttelton reported an encounter with the duke and the duchess, noting that “hard by his house mett us on the way my Lord of Newcastle and my Lady, whose behavior was very pleasant, but rather to be seen than told. She was dressed in a vest, and, instead of courtesies, made leggs and bows to the ground with her hand at her head.”⁴¹ In 1667 John Evelyn wrote,

I went to make court to the Duke and Duchess of Newcastle, at their house in Clerkenwell, being newly come out of the north. They received me with great kindness, and I was much pleased with the extraordinary fanciful habit, garb, and discourse of the Duchess.⁴²

The fascination of men such as Lyttelton and Evelyn (who were both influential among London’s natural philosophers) in part accounts for the invitation extended to Cavendish by the Royal Society in late May 1667 in response to her expressions of interest.

The Royal Society, a body of gentlemen devoted to expanding knowledge of the natural world and experimenting with the methods and devices best suited to that endeavor, had received its royal charter in 1662 and was busily working out its formal mission and collective identity. In 1666, the year before her visit to the Royal Society, Cavendish had published her most elaborate treatise on the nature of matter and perception, *Observations upon Experimental Philosophy*, in which, among other things, she explored both the value and limitations of scientific instruments such as microscopes, telescopes, and air pumps. In *The Blazing World*, the fictional work appended to *Observations*, she refracted those evaluations through the lens of a three-part philosophical romance, combining casual self-parody with caricatures of key members of the Royal Society who were cast as jostling, overeager animal men.⁴³ This suggests that the invitation to Cavendish was at least partially meant to mitigate the public sting of her droll depictions of their experimental endeavors. They certainly meant to take advantage of her

40. See April 11 and May 1, 1667, *The Diary of Samuel Pepys*, ed. Robert Latham and William Matthews, 11 vols. (Berkeley: University of California Press, 1974), 8:163–64, 196–97.

41. See Sir Charles Lyttelton, in *Hatton Correspondence*, ed. E. M. Thompson (London, 1878), 1.47, cited in Grant, 184, who notes that this sort of cross-dressing was practiced by a number of stylish ladies before the Civil War (at the court of Henrietta Maria) and again after (among members of Anne of Denmark’s retinue).

42. John Evelyn, *The Diary and Correspondence of John Evelyn*, ed. William Bray (London: Routledge, n.d.), 293.

43. See Cavendish, *Blazing World*, 71–100, where various animal men show telescopes, microscopes, air pumps, and chemistry exercises to their female interlocutor.

fame.⁴⁴ As it turned out, the visit was well attended and well documented: she arrived with an elaborate train, her philosophical correspondent Walter Charleton gave an oration for the occasion, and Robert Boyle, Robert Hooke, and others performed elaborate demonstrations for her, each duly noted in the Society's official record.⁴⁵ In any case, as her book of the previous year so amply illustrates, there was little new to her on display at this famous meeting of the Royal Society.⁴⁶

Cavendish continued to write and publish, refining her theories of nature and matter, and issuing updated editions of several of her previous works, until her death in 1673 at age fifty. Some evidence suggests that she may have been working on another book of poems, but no manuscript has yet surfaced.⁴⁷ After a lavish funeral, she was entombed in Westminster Abbey, where her husband, William, eventually joined her after he died in December 1676. The epitaph William penned for their final resting place is an appropriate conclusion to the narrative of her life, for it emphasizes both their unity as a couple and her unique place in the history of ideas: "Here lyes the Loyall Duke of Newcastle and his Duchess ... [who] was a wise wittie & learned Lady, which her many Bookes do well testifie. She was a most Virtuouse & a Louieng & carefull wife & was with her Lord all the time of his banishment & miseries & when he came home never parted from him in his solitary retirements."

Margaret Cavendish's Published Works

Cavendish published twelve books and later revised and reissued six of them.⁴⁸ Her first three publications—*Poems and Fancies* (1653), *Philosophical Fancies*

44. See Pepys's *Diary*, 8:243, where he writes of the society's nervousness. For a negative reconstruction of Cavendish's visit to the Royal Society, see Samuel I. Mintz, "The Duchess of Newcastle's Visit to the Royal Society," *Journal of English and Germanic Philology* 51, no.2 (1952): 168–76. For an alternative view, see Lisa Sarasohn, *Natural Philosophy*, 25–33, and "A Science Turned Upside Down: Feminism and the Natural Philosophy of Margaret Cavendish," *Huntington Library Quarterly* 47 (Autumn 1984): 299–307.

45. See Thomas Birch, *The History of the Royal Society for Improving of Natural Knowledge* (London: 1756–1757), 2:177–78. For Pepys's account, see *Diary*, 8:243. Charleton's autograph of his oration on the occasion of Cavendish's visit is in Bodleian MS Smith 13, 21–3.

46. For an excellent reappraisal of the visit in light of the fact that several early members of the Royal Society shared with Cavendish certain reservations respecting particular experimental methods, see Emma Wilkins, "Margaret Cavendish and the Royal Society," *Notes and Records: The Royal Society Journal of the History of Science* 68, no. 3 (2014): 245–60, <http://rsnr.royalsocietypublishing.org/content/68/3/245>.

47. Whitaker, 338.

48. I am including *The Blazing World* as a separate book in this count. Note that Cavendish also prepared and sent special presentation copies of her books to the library of the University of Leiden, to several of the Oxford and Cambridge colleges, to the playwright Thomas Shadwell, to her friends the

(1653), and *Philosophical and Physical Opinions* (1655), stake an early claim for her scientific theories.⁴⁹ *The World's Olio* (1655)⁵⁰ extends her proclivity for literary experimentation, a trend that continues with *Nature's Pictures* (1656), *Plays* (1662), *Orations of Diverse Sorts* (1662 and 1663), and *CCXI Sociable Letters* (1664). In 1663, Cavendish printed a carefully revised edition of *Philosophical and Physical Opinions*, a work she frequently mentions in subsequent philosophical treatises, suggesting its foundational role in her philosophy.⁵¹ She published *Philosophical Letters* in 1664 and completed a much-revised second edition of *Poems and Fancies* the same year.⁵² Two years later (1666), she released a volume containing her extended science treatise, *Observations upon Experimental Philosophy*, accompanied by a science-fictional romance, *The Description of a New World, Called the Blazing World*.⁵³ Her next publication was something of a sensation (Pepys stayed home from work all day to read it), *The Life of the Thrice Noble, High and Puissant Prince, William Cavendish, Duke, Marquess and Earl of Newcastle* (1667), one of the first biographies printed in English.⁵⁴

The following year, Cavendish published *Grounds of Natural Philosophy* (1668); *Plays Never Before Printed*; a stand-alone edition of *The Blazing World*; another edition of *Observations upon Experimental Philosophy* with *The Blazing World* again appended; and the final edition of *Poems and Fancies*. *Plays Never Before Printed* includes what is perhaps Cavendish's most daring dramatic piece, *The Convent of Pleasure*, a comedy that foregrounds the question of what is "natural" on several levels while developing a lively critique of gender and class

Duartes, and to individual philosophers including Glanvill, Huygens, Charleton, More, Digby, and Hobbes. Some of the presentation copies are quite distinctive.

49. *Philosophical Fancies* was revised and expanded as *Philosophical and Physical Opinions* in 1665 and 1663. The latter, in turn, would be further revised and reissued as *The Grounds of Natural Philosophy* in 1668.

50. Cavendish tells us this was her first book, written before *Poems and Fancies*, though released for print two years later. See *TR*, 382.

51. With respect to revision, note that Cavendish frequently corrected printer errors by hand when preparing presentation copies for individual readers. For a good example, see Heather Wolfe, "A Newly Uncovered Presentation Copy by Margaret Cavendish," *The Collation: Research and Exploration at the Folger*, blog, January 26, 2012, <http://collation.folger.edu/2012/01/a-newly-uncovered-presentation-copy-by-margaret-cavendish/>.

52. For further discussion of revision, see Jeffrey Masten, "Material Cavendish: Paper, Performance, 'Sociable Virginity,'" *Modern Language Quarterly* 65 (2004): 49–68, and James Fitzmaurice, "Margaret Cavendish on Her Own Writing: Evidence from Revision and Handmade Correction," *Publication of the Bibliographic Society of America* 85, no. 3 (1991): 297–307.

53. See Mendelson's introduction to Cavendish, *Blazing World*, 18–20, for a discussion of the relationship between the two works.

54. Pepys, *Diary*, 9:123–24.

norms.⁵⁵ In 1671, second editions of *The World's Olio* and *Nature's Pictures* (now minus *A True Relation*) appeared in print, and three years after Cavendish's death, in 1673, William published *Letters and Poems in Honor of the Incomparable Princess Margaret, Duchess of Newcastle* (1676). This last volume included items written in memoriam, as well as letters and poems addressed to Cavendish during her lifetime, suggesting the possibility of augmenting the current corpus of Cavendish's oeuvre by searching for letters she wrote to others. Her fictional persona in *Sociable Letters* notes suggestively, "I am so prudent and careful of my poor labors ... as I always keep the copies of them safely with me until they are printed, and then I commit the originals to the fire."⁵⁶ Tracking down Cavendish's letters may lead to surviving copies of unfinished manuscripts that somehow escaped the flames.⁵⁷

Poems and Fancies

Poems and Fancies is prefaced by several dedicatory epistles and six poems. The book proper is made up of five major segments, Parts 1–5, which include 270 poems. Each part additionally contains prose dedications and asides as well as dramatic interludes. The volume also includes a prose parable, *The Animal Parliament*, which follows Part 5, and the book ends with a conclusion consisting of four final poems. The book thus contains 280 poems in all. *Poems and Fancies* ranges through topics in natural philosophy (including atomism, biology, chemistry, medicine, psychology, anatomy, magnetism, astronomy, and meteorology), political theory, local history and folklore, mathematics, and moral philosophy. Its overall coherence develops through variations on three Epicurean⁵⁸ themes: atomic motion and form by which is expressed Nature's creative variability; the pleasures, pains, and paradoxes of perception in relation to knowledge; and the tension between the constant emergence of new life, on the one hand, and the inevitability of death, on the other. The book departs from Epicurean philosophy by threading a connective, sympathetic vitalism through Lucretius's otherwise dead atoms: for Cavendish, complex forms of life are the result of purposeful

55. See *The Convent of Pleasure and Other Plays*, ed. Anne Shaver (Baltimore: Johns Hopkins University Press, 1999).

56. See her persona of *SL*, 296. For a discussion of the lack of manuscript copies of Cavendish's work, see James Fitzmaurice, "Some Problems in Editing Margaret Cavendish," in *New Ways of Looking at Old Texts: Papers of the Renaissance English Text Society, 1985–1991*, ed. W. Speed Hill (Binghamton, NY: Medieval and Renaissance Texts and Studies / Renaissance English Text Society, 1993), 253–61.

57. Continental archives may be especially fruitful in this regard.

58. Epicurus (ca. 341–270 BCE) was an influential Greek philosopher best known for teaching an empiricist theory of knowledge, a description of nature based on atomistic materialism, and a social philosophy aimed at the attainment of *ataraxia*, or tranquility. See David Konstan, "Epicurus," *SEP*.

interactions among vibrant particles rather than accidental collisions between senseless atoms.

As previously mentioned, the book was published in London (1653) shortly after Cavendish's return to Antwerp, where she rejoined her husband, William, at the Rubenshuis. In her rush to get the book to the printer before leaving London, she dispensed with revisions, but a decade later, revise she did: in 1664 Cavendish published a significantly altered second edition of *Poems and Fancies*,⁵⁹ and in 1668 she released the final edition with further changes. The 1668 version provides the source text for this modern spelling edition, with deleted prose segments from the 1653 edition included in appendix 1. The inclusion of deleted portions from the earlier 1653 edition highlights Cavendish's preferred changes for the 1668 edition while allowing readers to evaluate those changes with relative ease.⁶⁰

In the decade between the first edition of *Poems and Fancies* in 1653 and the second edition of 1664, Cavendish published orations, dramatic epistolary exchanges, an autobiography, treatises on natural philosophy, and more. By 1664, her skills as a writer were more polished, an expertise readily visible in the changes she made in the final two editions of the book (1664 and 1668). She reorganized the order of several of the poems, making topical and thematic links more clearly discernable, and in a handful of cases she combined what originally were separate poems into longer, more sophisticated treatments. Cavendish also changed the syntactical array of many lines, in several cases yielding poems attired in better clarity than their predecessors. In some instances, she changed her similes and metaphors to increase the complexity of her comparisons, and in others she evened up the rhyme and number (or meter) of her lines, making her witty observations canter along at a smoother pace.

Did any of the poems suffer from the added curbs of these new bridles? Certainly there is an undeniable freshness to the self-conscious "An Excuse for So Much Writ upon My Verses" of the first edition, which begins,

Condemn me not for making such a coil
About my book; alas, it is my child.

These lines are defensively declarative, sharp with the hard-edged social awareness of one whose focus is on "me" (the self) while the "my book ... my child" parallel construction serves as both an intensifier of the poet's self-consciousness as a writer and a modifier of what it means to be a writer (here, a kind of motherhood). To make "a coil" is to cause turmoil and confusion—a choice matching the rueful yet guarded tone of "alas" in this context. In the revised version, retitled

59. See "To the Reader" in this volume and *TR*, 382–83, where Cavendish declares she had no time to revise the first edition of *Poems and Fancies*.

60. For further details, see the note on the text below, 51–54.

“An Apology for Writing So Much upon this Book,” only the first two lines have been changed:

Condemn me not, I make so much ado
About this book; it is my child, you know.

Here, the tone is both more nuanced and less distressed, emphasizing not the troublesomeness of the child but the parent’s helpless affection for it. The perspective is from a more mature vantage (this mother can step back from “my book” to consider “this book”), and the line “it is my child, you know,” seems to come with a wistful smile, inviting commiseration rather than forgiveness from the reader—a tonal shift that makes a more compelling case for accepting a woman author’s literary offspring.

The final edition of *Poems and Fancies* is rich with such small changes, adjustments that yield a more seasoned and far less apologetic authorial tone. Of course, some changes may cause readers to wince, since the two major deletions Cavendish made in the second edition (and retained in the third) are of spirited feminist segments. Most notable is her dedication, *To All Writing Ladies*, originally located at the start of Part 4, preceding *To the Reader, Concerning Fairies*. Beginning with a survey of “many Ages,” the dedication describes the “contagions” that “work . . . upon the minds of men.” Yet Cavendish is encouraged by evidence that her age may expand upon the benefits forged by “many heroic women” from the past, women whose memory is meant to prod her female readers to similarly heroic deeds:

And if it be an age when the effeminate spirits rule, as most visibly they do in every kingdom, let us take the advantage, and make the best of our time, for fear their reign should not last long . . . let us [women] . . . strive to build us tombs, while we live, of noble, honorable, and good actions. . . .

That though our bodies die,
Our names may live to after memory.

Cavendish may have felt that this lengthy paragraph had become redundant since her proto-feminist apologia in the dedication, *To All Noble and Worthy Ladies*, is wittier and funnier: it rallies women to her side under the banner of popular memory, including references to playwright John Fletcher’s husband-taming heroine from *The Woman’s Prize*, and poet Lady Mary Wroth’s poetic thrashing of Lord Edward Denny. Perhaps by 1664 she felt more comfortable in her continued communications with Constantijn Huygens, Walter Charleton, and Joseph Glanvill, so that, given the engagement of such men with several of her questions and theories, this second, less humorous call for a special alliance among women

no longer seemed as apt.⁶¹ In any case, the dedication she kept for all three editions addresses more directly the problem of being a woman in the cut-and-thrust of public scientific debates, making the deletion of the redundant segment a smart editorial choice. So it is with the other major prose deletion, a paragraph near the very end of the volume that laments repetitiously, “I know, those that are strict and nice about phrase, and the placing of words, will carp at my book.” By 1664 Cavendish had published half a dozen works and had achieved considerable celebrity: the time for excuses had passed. In short, the fine en garde posture of the feminist portion she kept is unquestionably stronger and more rhetorically ready than the feeble tone of the complaints she chose to delete.

Following the example of George Sandys’s translation of Ovid’s *Metamorphoses* (1632), one of her models for *Poems and Fancies*, Cavendish composed most of her poems in heroic couplets consisting of rhyming pairs of lines in iambic pentameter. She often employs enjambment, usually to heighten a sense of the absurd or to develop a conceptual entanglement, and she cuts back on the number of slant rhymes in her revised editions, only retaining them for passages where she is willing to lose in clarity what she gains in amplification. Indeed, Cavendish is less a metrical stylist than a rhetorical one: in addition to amplification, her favored strategies include digression, reversal, personification, and irony. She also relies heavily on apostrophe, dramatic dialogue, strained analogies, doubled perspectives, and elliptical or recursive meditation, and her penchant for dialogues representing opposing views mirrors the skeptical strain in her thought: knowledge is a question of probability, not certainty. Ultimately, though, the changes to the 1664 and 1668 editions are developed in the service of the volume as a whole: For the sake of her matter theory, clarity of concept is favored above the delights of ambiguity.⁶² Even so, her poems retain their entrancing charm, linking startling reorientations of perspective to propositions about the nature of a world at once variable, beautiful, and strange.

In writing *Poems and Fancies*, Cavendish was influenced by numerous literary and philosophical sources. She had perused a wide swath of scientific treatises and a good number of other works—including plays, jest books, poem collections,

61. Many of the letters from Charleton and Glanvill are in *Letters and Poems*. Only eleven letters between Cavendish and Huygens have yet been found, but that correspondence covered a period of at least fourteen years, from 1657 until 1671. For added insight on Huygens and Cavendish, see Lisa Jardine, *Going Dutch: How England Plundered Holland’s Glory* (New York: 2008), 198–204.

62. For an astute analysis of how and why even Cavendish’s “bad” writing provides so much literary pleasure—especially in her use of ambiguity and her lawless attitude toward expected forms of rhetorical decorum—see Lara Dodds, “Bawds and Housewives: Margaret Cavendish and the Work of ‘Bad Writing,’” *Early Modern Studies Journal* 6 (2014): 29–65. Dodds explains, “Cavendish’s critics—from her own time to quite recently—called her a bad writer because she didn’t follow the rules, but twenty-first century readers also like her because she didn’t. Her work is usually most interesting where it is least like what she should have been writing” (44).

fairy lore, romances, and cookery books—allusions to which are frequent throughout *Poems and Fancies*. Clearly discernable literary influences include such luminaries as Lucretius, Homer, Hesiod, Plutarch, Vergil, Thucydides, Ovid, Boethius, Boccaccio, Spenser, Shakespeare, Raleigh, Sidney, Jonson, Fletcher, Wroth, Donne, Drayton, Milton, and many others. Cavendish also leaned heavily on the works of mathematicians, including Euclid, Archimedes, and Pythagoras. She was well acquainted with the early thought of Hobbes, Descartes, and Galileo, and her many allusions to the literature of natural philosophy demonstrate the degree to which she had been reading far more widely than her initial apologia would suggest. Ultimately, though, Lucretius was the true spark that set Cavendish to writing, leading her to wed atomism to vitalism and probability theory, and firing up her further fascination with the new mathematics.⁶³ Indeed, *Poems and Fancies* is best understood as a conversation with Lucretius's *De rerum natura* [On the nature of things], and to some extent, presumes readers' familiarity with that work.⁶⁴ Lucretius's famous poem remains one of the most comprehensive expositions of Epicurean philosophy we have and is widely considered the most beautiful. *On the Nature of Things* weaves together basic elements of Epicurean atomism, including radical materialism (matter exists in the form of innumerable, indivisible, and unchangeable particles) and the subordination of physics to ethics. It also asserts the conservation of matter (matter cannot be created from nothing, nor can it be destroyed); the proposition that void (empty space) allows matter to move, and movement opens up the possibility of freedom; and the idea that atoms fall downward in the void but occasionally swerve without cause. This spontaneous, chance swerve results in atoms colliding and becoming locked together, yielding compound structures or bodies. Most radically, Epicurean atomism taught that both soul and body are material, and are subject to the temporal pattern of emergence, growth, maturity, decline, dissolution and resolution into their component atoms.⁶⁵ Indeed, Lucretius's *On Nature* unfolds as a vast tapestry of imagery meant to celebrate both the explanatory power of the fundamental "seeds" of life and the abundant variety and beauty of the kinds of life those seeds became: "I . . . shall disclose the first-beginnings of things . . . and seeds of things,

63. Titus Lucretius Carus (ca. 99–55 BCE) was a Roman poet best known for his long Epicurean poem, *De rerum natura*. Lucretius gave the Epicurean elevation of intellectual pleasure and tranquility of mind (and its dim view of social strife and political violence) an extended naturalistic explanation. His revival in sixteenth and seventeenth century Europe fueled theories of matter in natural philosophy. See David Sedly, "Lucretius," *SEP*.

64. Cavendish incorporates some of Lucretius's theories into her own philosophy, but invokes others in order to repudiate them. *Poems and Fancies* should be read in the context of the forms of atomism being developed by contemporaries. See Antonio Clericuzio, *Elements, Principles, and Corpuscles: A Study of Atomism and Chemistry in the Seventeenth Century* (Dordrecht, NL: Kluwer, 2000).

65. In contrast, Democritus theorized that atoms move in all directions; that atomic motion is a function of necessity, determined by natural law; and that ethics is subordinate to that law as described by physics.