

“She erected schools, and founded several societies”:

Reimagining Margaret Cavendish’s Visit to The Royal Society

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Abstract

In academic discourse, Margaret Cavendish's attendance at a meeting of the Royal Society on May 30, 1667 is often cited as proof that she was deeply hostile towards early scientific experimentalism. While some scholars have noted the disdain with which the Society supposedly viewed Cavendish, others have pointed to various passages in her published writing as evidence of this conflict. In this paper I examine the sources that these arguments are built upon, arguing that the first-hand accounts of the visit found in *Samuel Pepys' Diary* and Thomas Birch's *The History of the Royal Society* are problematic as accurate historical records of the event. Further, I demonstrate that excerpts from Cavendish's *The Blazing World* which deal with scientific experimentalism are more nuanced than previous commentators have proposed. This approach challenges the narrative surrounding her visit and suggests that the relationship between Cavendish and the Royal Society was characterised more by mutual respect than has previously been acknowledged.

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Introduction

When Margaret Cavendish, the Duchess of Newcastle, visited the Royal Society of London on May 30, 1667, it was an event that attracted considerable public attention. Cavendish, who had published “plays, poetry, orations, essays and even works of natural philosophy,” was well-known and her appearance at this meeting, as the first woman to visit the Society, created a great deal of interest among the members.¹ Samuel Pepys, who was in attendance, later provided a less-than-flattering account of the Duchess’ visit in his diary entry for that day, a report which would come to influence attitudes toward the event itself as well as the scholarly assessment of Cavendish’s relationship with the Royal Society and scientific experimentalism in general. What developed was a narrative that told of the Duchess’ hostility towards the Royal Society and a visit that, despite its novelty (or perhaps because of it), was not considered a serious affair. While Emma Wilkins convincingly argues for “a more nuanced” view of the relationship between Cavendish and the Royal Society based on the Duchess’ support of “important aspects of the Society's programme . . . [and the fact] that [her] objections to experimentalism were neither 'unique' nor isolated from contemporaries,” this paper demonstrates that the same can be accomplished by taking a closer look at the first hand account of the visit recorded in the official minutes of the meeting to contextualize and critique the sources most commonly cited in relation to Cavendish’s visit.² Further, by suggesting that the experiments prepared for Cavendish’s benefit were intended as an earnest response to the Royal Society’s critics (the Duchess

¹ Emma Wilkins, “Margaret Cavendish and the Royal Society,” *Notes and Records of the Royal Society of London* 68, no. 3 (2014): 245.

² Wilkins, 256.

included), this paper argues that the relationship between Cavendish and the Royal Society was characterised more by mutual respect than has previously been acknowledged.

The scholarship on Cavendish's visit to the Society has remained, until very recently, virtually unanimous in describing the event as something of a farce. Samuel Mintz, who, according to Wilkins, "offered the first detailed account of Cavendish's visit to the Royal Society" in 1952 was explicit in his disdain.³ Throughout his article, Mintz portrays Cavendish as having a "candid, undisturbed, childlike love of the natural world, and . . . [a] disregard for the methods and utilitarian aims of science."⁴ And, while many of his claims lack evidence, they nevertheless contributed to an emerging consensus that "Cavendish was an 'anti-experimentalist' who failed to understand the true significance of the methods employed by Robert Boyle, Hooke, and other Royal Society luminaries."⁵

As Emma Wilkins has noted, even while Cavendish's reputation has been, to a certain extent, rehabilitated by recent scholarship which seeks to demonstrate that her views were "neither silly nor mad, . . . [such attempts share] the same established view that Cavendish was . . . opposed to the practices of the Royal Society."⁶ For example, Lisa Sarasohn writes,

Although the duchess was the only woman in the period ever to be invited to a session of the Royal Society, she was invited only to observe a few experiments . . . Not surprisingly, Cavendish treated the empirical methodology of the Royal Society with great scorn,

³ Wilkins, 246.

⁴ Samuel Mintz, "The Duchess of Newcastle's Visit to the Royal Society," *Journal of English and Germanic Philology* 51 (1952): 176.

⁵ Wilkins, 246.

⁶ Wilkins, 246

claiming that the microscopes and telescopes of experimental science could never discover the interior secrets of nature.⁷

Here, Sarasohn makes several assumptions that influence her reading of the event. First, there is her comment that Cavendish was “invited *only* to observe a *few* experiments”—when, in fact, on May 23 when the matter of the Duchess’ visit was first raised, the Society proposed eight demonstrations.⁸ Also, Sarasohn takes a simplified reading of Cavendish’s objections to microscopy (which, as we will see, were common to many of Cavendish’s contemporaries) as evidence for the Duchess’ “great scorn” for empirical methodology and the Royal Society. However, these conclusions are challenged by Wilkins’ observation that Cavendish’s “commitment to plain English, . . . desire for discursive liberty free from dogmatism, and . . . Baconian emphasis on the usefulness of natural philosophy were all views with which many Fellows concurred.”⁹

Similarly, Eve Keller observes that “Margaret Cavendish . . . set out, with no formal credentials other than her impressive social title, to critique the newly chartered institution of mechanist and experimental science, the Royal Society.”¹⁰ Here we see echoes of both Mintz and Sarasohn’s disparaging characterization of the visit in the assumption that, because of her “impressive social title,” Cavendish’s previous literary efforts did not qualify as “credentials” in the eyes of the Royal Society. Likewise, when Keller writes that Cavendish “was granted

⁷ Lisa Sarasohn, “A Science Turned Upside Down: Feminism and the Natural Philosophy of Margaret Cavendish,” *Huntington Library Quarterly* 47, no. 4 (1984): 292.

⁸ Royal Society of London MS. Journal Book 3, 99 (*italics mine*).

⁹ Wilkins, 255-256.

¹⁰ Eve Keller, “Producing Petty Gods: Margaret Cavendish’s Critique of Experimental Science,” *ELH: A Journal of English Literary History* 64, no. 2 (1997): 447-448.

admission for one day to the Royal Society to watch selected experiments performed for her amusement and, presumably, her admiration” she not only repeats Mintz’s interpretation of the event, she cites his paper as evidence.¹¹

While we have seen several examples of the persistence with which Mintz’ ideas concerning Cavendish’s visit have found their way into the scholarship surrounding the event, the question remains: whence did Mintz draw his influential account? The two main sources that Mintz employs—Thomas Birch’s *The History of the Royal Society of London* (1756) and *The Diary of Samuel Pepys* (1825)—are both, upon closer examination, revealed as problematic sources for an unbiased account of Cavendish’s visit to the Royal Society.

The Diary of Samuel Pepys

Written between 1660 and 1669, Samuel Pepys’ diary has been described as “an astonishingly vivid and disciplined exercise in self-analysis, a historical document of the first rank, and a literary classic.”¹² Unpublished in his own lifetime, the manuscript of Pepys’ diary was written in an impenetrable shorthand which lay untranslated until Pepys’ literary executors had the manuscript deciphered and published in 1825.¹³ Covering the first decade of the English Restoration, the curious mix of the topical, sensational, and the mundane contained within the document has excited interest from various fields. Various descriptions of the author’s “struggle to become the person the dominant ideology of his time seemed to require him

¹¹ Keller, 448.

¹² C.S. Knighton, “Pepys, Samuel (1633–1703), naval official and diarist.” *Oxford Dictionary of National Biography*.

¹³ Knighton, “Samuel Pepys,” *ODNB*.

to be,” “a systematic and statistical account of [his] reading practices,” and “a future-orientated textual ethos separate from the ‘I’ that held the pen,” Pepys’ work continues to receive a great deal of scholarly attention; however, that interest should not blind us to the document’s shortcomings as an historical record.¹⁴

In the two months leading up to Cavendish’s visit to the Royal Society, Pepys’ diary dwells on the Duchess with a fixity bordering on obsession. Starting on March 30, 1667, he writes,

At noon home to dinner; and thence, with my wife’s knowledge and leave, did by coach go see the silly play of my Lady Newcastle’s called *The Humorous Lovers*, the most silly thing that ever come upon a stage; I was sick to see it, but yet would not but have seen it, that I might the better understand her.¹⁵

Evidently Pepys’ interest had been piqued, because this desire to “understand” Cavendish motivates him to expend considerable effort attempting to get a glimpse of the Duchess of Newcastle. For instance, twelve days after seeing her play performed, Pepys tells us that:

And I to White-hall, thinking there to have seen the Duchesse of Newcastle’s coming this night to Court . . . There is as much expectation of her coming to Court, that so [many]

¹⁴ John H. O’Neil, “Samuel Pepys: The War of Will and Pleasure,” *Restoration: Studies in English Literary Culture* 19, no. 2 (1995): 89; Elspeth Jajdelska, “Pepys in the History of Reading,” *The Historical Journal* 50, no. 3 (2007): 552; Mark S. Dawson, “Histories and Texts: Refiguring the Diary of Samuel Pepys,” *The Historical Journal* 43, no. 2 (2000): 431.

¹⁵ Samuel Pepys. *Pepys's Diary: Volume VIII*. Edited by Robert Latham and William Matthews. Berkeley: HarperCollins, 1995: 137.

people may come to see her, as if it were the Queen of Sweden. But I lost my labour, for she did not come this night.¹⁶

Undeterred by this failure, Pepys is granted his first glimpse of Cavendish on the 26th of April, where he reports both the excitement surrounding the Duchess' arrival in London as well as his own first impression:

And in the way met my Lady Newcastle, going with her coaches and footmen all in velvet . . . (for all the town-talk is now-a-days of her extravagancies), with her velvet-cap, her hair about her ears, many black patches because of pimples about her mouth, naked necked, without anything about it, and a black juste-au-corps; she seemed to me a very comely woman.¹⁷

Despite this success, Pepys was clearly not satisfied by this brief glimpse of the Duchess because, a mere five days later, he is again hoping to meet her and attempts what can only be described as an elaborately planned, but ultimately unsuccessful, stakeout:

That which we and almost all went for was to see my Lady Newcastle; which we could not . . . When we had spent half an hour in the Park, we went out again, weary of the dust, and despairing of seeing my Lady Newcastle; and so back the same way and to [St. John's], thinking to have met [her] before she got home; but we staying by the way to drink, she got home a little before us, so we lost our labours.¹⁸

Finally, on the 10th of May, his previous efforts frustrated or unsatisfactory, Pepys resorts to faster transportation to get a more meaningful look at the Duchess: "Drove hard towards

¹⁶ Pepys, *Volume VIII*, 163-164.

¹⁷ Pepys, *Volume VIII*, 186-187.

¹⁸ Pepys, *Volume VIII*, 196-197.

Clerkenwell . . . thinking to have overtaken my Lady Newcastle, whom I saw before us in her coach, with 100 boys and girls running looking upon her; but I could not and so she got home before I could come up to her, but I will get a time to see her.”¹⁹

Considering the significant influence that Pepys’ account of Cavendish and her visit to the Royal Society has had, it seems appropriate to ask what this two-month period reveals about his attitude towards the Duchess of Newcastle. Clearly, his emphasis on her physical attributes and the observation that she was “a very comely woman” are consistent with the “hedonistic” reputation of Pepys diary.²⁰ But, perhaps more importantly, the zeal with which he records the “town-talk” surrounding Cavendish suggests he was already predisposed to view her appearance at the Royal Society as being a social, rather than scientific, affair—an interpretation supported by Pepys’ prediction that “the town will be full of ballets” concerning the Duchess’ visit.²¹

Whatever Pepys’ motivations during this time, it seems clear that he had little or no interest in Cavendish’s literary and intellectual efforts and, therefore, cannot be considered a reliable witness when it comes to judging either the scientific merit of the demonstrations shown to the Duchess or the depth of her understanding concerning them; and yet, this is precisely what Mintz does when he takes Pepys’ opinions of the Duchess’ visit at face value. For example, Pepys’ claim that when the issue of inviting Cavendish was put to a vote there was “much debate pro and con . . . [with] many being against it” is repeated by Mintz when he claims that there “was considerable opposition” to the idea.²² Likewise, Mintz’s assertion that the quite ordinary

¹⁹ Pepys, *Volume VIII*, 209.

²⁰ Knighton, “Samuel Pepys,” *ODNB*.

²¹ Pepys, *Volume VIII*, 243.

²² Pepys, *Volume VIII*, 243; Mintz, 171.

command from Lord Brouncker to Robert Hooke that concluded the meeting was perhaps designed to “show that he was still in authority, or possibly to assert the Royal Society's ultimate independence of noble ladies” may recall Pepys’ dismissive attitude towards the event, but it should not be taken seriously as an objective historical account.²³

As we look at Pepys’ diary entry from May 30, 1667 we get more of the same regarding Cavendish. Pepys confirms that she is a “good, comely woman” but adds that “her dress [is] so antic and her deportment so unordinary, that I do not like her at all, nor did I hear her say anything that was worth hearing, but that she was full of admiration, all admiration.”²⁴ This idea of Cavendish being effusive in her admiration is taken farther by Mintz when he implies that every experiment the Duchess was shown was met by ever-escalating expressions of praise: “The Duchess was delighted” with the first experiment and “must surely have been dazzled” by the second and, with the demonstration of a lodestone that could move a compass from seven feet away, Mintz lapses into pure fantasy:

The Duchess came forward to see the needle move. Here was a power which traveled through air. Here was a strange force indeed. The whole company watched her . . . all watched this eccentric lady who was obviously deeply moved by this simple display of one of nature's marvels.²⁵

The scene that Mintz conjures is especially telling considering the relative brevity with which Pepys treats the entire appearance of the Duchess. In his entry for the 30th of May, Pepys has little new to say about the Duchess and spends an equal amount of time considering her retinue.

²³ Mintz, 176.

²⁴ Pepys, *Volume VIII*, 243.

²⁵ Mintz, 174-175.

Most importantly, in no way does he offer the sort of detailed moment-by-moment description that Mintz takes away:

Several fine experiments were shown her of Colours, Loadstones, Microscope, and of liquors: among others, of one that did while she was there turn a piece of roasted mutton into pure blood . . . After they had shown her many experiments, and she cried she was “full of admiration,” she departed, being led out and in by several Lords that were there; among others, Lord George Barkeley and Earl of Carlisle and a very pretty young man, the Duke of Somerset. She gone, I by coach home.²⁶

Perhaps most bizarrely, Mintz states with certainty that “before she left, the Duchess was shown the Royal Society's library. She gazed admiringly at the books, and looked with interest at the pictures of Turkish habits on the wall.”²⁷ For a citation, Mintz refers us to an unrelated entry from February 21, 1667 in Thomas Birch’s *The History of the Royal Society of London* where the minutes of the Society’s meeting *do* mention a gift from one Mr. Howard of “several pictures of Turkish habits” presented them with the intention of being hung at Arundel House; however, the connection between that gift and the Duchess’ visit over three months later exists only in the imagination of Samuel Mintz.²⁸

While there is little satisfaction in critiquing a journal article that is nearly seventy years old, the exercise does help to illustrate the prevailing tone surrounding Cavendish studies in the mid-twentieth century as well as the influence that Samuel Pepys’ account of May 30, 1667 had three centuries after it was written. This becomes doubly important as we turn to the other

²⁶ Pepys, *Volume VIII*, 243-244.

²⁷ Mintz, 175.

²⁸ Thomas Birch, *The History of the Royal Society of London* vol II: 150

commonly cited source that Mintz cites—Thomas Birch’s *The History of the Royal Society of London*—and examine how it differs from the original record of the Royal Society’s meeting.

Thomas Birch’s *The History of the Royal Society of London*

In the Preface to his four-volume *The History of the Royal Society of London*, Thomas Birch states his intention to compile “the original journals, registers, letter and council-books [of the Royal Society,] both [as] a supplement to Bishop Sprat’s History, and a continuation of it . . . with the addition of the most important papers communicated to the Society, which have not yet been published.”²⁹ To this end, the *Journal Books* of the Royal Society are reproduced almost verbatim by Birch, with his account standing as the only published record of the meeting’s minutes available outside of the original manuscript. However, while there are differences between the two versions (with it not being uncommon for Birch to paraphrase certain passages and replace titles like “The Curator” or “The President” with the individual’s proper name), rarely do these changes alter the substance of the original entry. Nevertheless, it could be argued that the more substantive changes that Birch *does* make to the passages concerning Cavendish’s visit, although subtle, suggest an editorial slant in favor of dismissing the event as a novelty.

The first deviation from the original manuscript in Birch’s transcription of May 23, when the matter of the Duchess’ invitation is first raised, is in his transposing of a verb. Where the original manuscript reads “The Lord Berkley *moved*, that the Dutchesse of Newcastle had expressed a great desire to come to the Society,” Birch’s version reads, “The Lord Berkeley *mentioned*, that the duchess of Newcastle had expressed a great desire to come to the society.”³⁰ While Birch

²⁹ Birch, vol I: “Preface.”

³⁰ Journal Book 3: 97-98; Birch, vol II: 176 (italics mine).

otherwise transcribes the passage as a formal resolution or motion, here, he seems to be implying that the matter was more casual than that. His choice is especially confusing considering the phrases “Mr. Boyle *moved*, that the following Magnetical Observations might be made” and “Mr. Boyle *moved* that it might be tried somewhere,” from April 25 and May 16 respectively, are left unaltered in their corresponding entries, suggesting Birch had not recently been in the habit of removing this particular word.³¹ In fact, also on May 16, Birch changes “Mr. Boyle *suggested*, that the Experiment of injecting wind or Air, might be improved” to “Mr. Boyle *moved*, that the experiment of injecting wind or air might be improved.”³² While the choice to change Lord Berkeley’s official *motion* regarding the Duchess into something he merely *mentions* may seem inconsequential, the more passive and informal connotations of the latter term take on extra meaning when considering an intriguing omission that Birch makes later in the same entry.

In both the original *Journal Books* of the Royal Society and Birch’s *History*, the Duchess’ wish to visit one of the Society’s meetings comes with the condition that “she desired to be invited.”³³ However, Birch’s account of the vote that followed is significantly different than its source. Where the original manuscript reports that Lord Berkeley’s motion was “seconded by the Earle of Carlisle and Dr Charleton who pressing that it might be put to the vote without balloting . . . it was carried in the affirmative,” Birch’s transcription makes no mention at all of Carlisle and Charleton’s request for an open-vote without secret ballots: “This was seconded by the earl of Carlisle and Dr. Charleton, who pressing, that it might be put to the vote accordingly .

³¹ Journal Book 3: 90; Journal Book 3: 96 (italics mine).

³² Journal Book 3: 97; Birch, vol II: 175 (italics mine).

³³ Journal Book 3: 98; Birch, vol II: 176.

. . it was carried in the affirmative.”³⁴ Here we again see how little sense there is in changing “moved” to “mentioned” as it is clear that, in the context of a meeting, it is far more appropriate for Carlisle and Charleton to second a *motion* being raised than a thing being *mentioned*. An even more striking result of Birch’s omission is that it diminishes the fact that three prominent members of the Royal Society felt strongly enough about the Duchess’ attendance at their next meeting that they wanted the matter settled in an open forum where, presumably, the members might be less inclined to snub such an illustrious guest. Or was it that a secret ballot might have implied a disrespect towards the aristocracy? However one chooses to read the matter of Birch’s omission, it seems clear that the account given of Cavendish’s visit in the original *Journal Books* does not suggest an underlying hostility between the Duchess and the Society—nor does it evoke the “debate” and “considerable opposition” reported by Pepys and Mintz.

Finally, in the entry concerning the Duchess’ actual visit, the only meaningful alteration of the original text that Birch makes is the addition of a few suggestive words. Where the original reads “The Dutchesse of Newcastle coming in, the Experiments appointed were made,” Birch’s transcription adds the following: “The duchess of Newcastle coming in, the experiments appointed *for her entertainment* were made.”³⁵ While it is possible that Birch is not using the word *entertainment* in a condescending way, it is still fair to ask why he made the addition to what is, otherwise, a faithful transcription of the original. Is anything gained or clarified by his alterations? Even if Birch did not intend to be patronizing, to a modern reader, the change emphasizes the informal aspect of the Duchess’ visit (and the fact that it was not a meeting of peers) while also recalling Pepys’ report of the circus-like atmosphere surrounding the event.

³⁴ Journal Book 3: 98; Birch, vol II: 176.

³⁵ Journal Book 3: 100; Birch, vol II, 177 (italics mine).

Taken together, all these alterations seem to be of a pattern and, while subtle, they still prompt the question: why did Birch alter the text at all? Why, in the case of Cavendish's appearance, does he choose to omit some details and add others when a verbatim transcription would have cost less effort? More importantly, would a researcher like Mintz see in Birch's changes confirmation of the account given in Samuel Pepys' diary? It is, I would argue, not unreasonable to suggest that Birch's account—with its emphasis on Lord Berkeley's *mention* of the Duchess' wish to be invited, its omission of the matter concerning an open-vote, and its report of the Duchess' subsequent *entertainment*—does seem to create the impression of an amateur out of her depth that we see in both Pepys' diary and Mintz's article. As Wilkins has pointed out, this characterization is especially unfair considering that “two important contemporary thinkers, Thomas Sydenham and John Locke, collaborated on an essay on microscopic anatomy just two years after Cavendish's [objections] appeared in print . . . [and] echoed [her] view that microscopes failed to reveal the internal workings of organisms.”³⁶

Unmentioned in all of this is the simple question: if Margaret Cavendish was truly an “anti-experimentalist” who felt “great scorn” for the methods of the Royal Society, why would she request an invitation to their meeting in the first place?³⁷ While Pepys would no doubt attribute it to her “mad, conceited, ridiculous” character, a more obvious solution might simply have been that, setting aside the criticisms towards the Royal Society that she shared with many of her contemporaries, the Duchess of Newcastle was genuinely interested in the working of their organization.³⁸ But if Cavendish was less hostile towards the Royal Society than has been

³⁶ Wilkins, 248.

³⁷ Sarasohn, 292.

³⁸ Samuel Pepys. *Pepys's Diary: Volume IX*. Edited by Robert Latham and William Matthews. Berkeley: HarperCollins, 1995: 123.

traditionally accepted, what can we say about their attitude towards the Duchess? I would argue that, in contrast to Mintz's idea that they felt the need to assert the "Royal Society's ultimate independence of noble ladies," the members of the Society who voted to include her were familiar with and respected Margaret Cavendish, the proof of which can be found in the demonstrations prepared for her that day—demonstrations that bear a striking resemblance to a number of passages in Cavendish's *The Description of a New World Called The Blazing World*.³⁹

The Royal Society's Demonstrations and *The Blazing World*

Published in 1666, *The Blazing World* (to use its common and less cumbersome title) is "a text which combines elements of romance and utopia and has sometimes been described as science fiction."⁴⁰ Originally published alongside the philosophical treatise *Observations upon Experimental Philosophy*, Cavendish claimed that her intention was to add "this piece of fancy to my philosophical observations, and [join] them as two worlds at the ends of their poles; both for my own sake, to divert my studious thoughts, and to delight the reader with variety, which is always pleasing."⁴¹ The plot is fantastic, with Cavendish's protagonist shipwrecked and stranded on a new planet—the titular 'Blazing World'—where she is made Empress over a population of curious human-creature hybrids and eventually leads an armada of submarine-like vehicles back

³⁹ Mintz, 176.

⁴⁰ Kate Lilley, "Introduction," *The Blazing World and Other Writings* by Margaret Cavendish, Edited by Kate Lilley. London: Penguin Books, 2004: xxiii.

⁴¹ Margaret Cavendish, *The Blazing World and Other Writings*. Edited by Kate Lilley. London: Penguin Books, 2004: 124.

to her home world to the aid of her former king. While others have reported that, after reading Cavendish, a contemporary remarked, “there are many soberer people in Bedlam,” it is perhaps only fair to judge the work on its own terms, as the “piece of fancy” the author intended, rather than a concentrated attack on the institution of the Royal Society or an organized system of thought.⁴² However, as a work of science fiction that seeks to extrapolate from current knowledge in the service of a narrative, *The Blazing World* is remarkably successful in dramatizing the social, political, and (especially) scientific issues of the day in a way that will be immediately familiar to any reader of twentieth-century speculative fiction.

While it is true that Cavendish held reservations about certain aspects of scientific experimentalism, some of which are expressed within *The Blazing World*, it must also be remembered that the fiction was not created within a vacuum; as Emma Wilkins notes, the narrative of Cavendish’s “supposedly ‘unique’ role” as a female critic of the scientific establishment falls apart when “considering [her] views in context rather than in isolation from her intellectual *milieu*.”⁴³ For example, if we are to take the fact that the lice-men of the Blazing World found the weighing of air “a task impossible to be done” as proof of “the Duchess of Newcastle indirectly instructing the newly established Royal Society of London that their instruments and experiments were not useful for investigating the world,” it should also be noted that many of her contemporaries raised similar objections.⁴⁴ For instance, Thomas Hobbes objected to the results produced by Robert Boyle’s air pump experiments based on his assertion

⁴² Mintz, 169. See also Lilley, xiii and Keller, 448.

⁴³ Wilkins, 249.

⁴⁴ Cavendish, *The Blazing World*, 159; Ian Lawson, “Bears in Eden, Or, This Is Not the Garden You’re Looking For: Margaret Cavendish, Robert Hooke and the Limits of Natural Philosophy,” *BJHS* 48, no. 4 (2015): 583.

that the pump “did not operate in the way that Boyle said it did; the physical integrity of the machine was massively violated, and, therefore, the claim that it produced a vacuum in the receiver . . . was without foundation.”⁴⁵ For both Hobbes and Cavendish, the problem with experimental philosophy is not its foundational principles so much as an unjustified (and uncritical) faith in the results obtained from flawed instruments. This is especially important because, given this context, it becomes more natural to view the demonstrations of the Royal Society as a serious-minded response to their critics instead of an attempt to humour the capricious whims of the Duchess of Newcastle.

To understand the significance of the demonstrations chosen for Cavendish’s benefit, it is helpful to note that, here too, scholars continue to follow a Pepys/Mintz line of thinking by dismissing the value of the experiments out of hand, as Richard Nate does when he claims (without evidence) that the Royal Society entertained the “Duchess with the usual visitors’ programme for members of the nobility . . . [and] performed a number of experiments that were, above all, visually attractive.”⁴⁶ In truth, it could just as easily be argued that the experiments were chosen to demonstrate the best of the Society’s research as a response to some of Cavendish’s more pointed criticisms. Whether the apparent correlation between the experiments chosen and certain passages in *The Blazing World* are the result of a conscious response to Cavendish’s work or simply because the novel and the Royal Society were concerned with the

⁴⁵ Steven Shapin and Simon Schaffer. *Leviathan and the Air-pump: Hobbes, Boyle, and the Experimental Life: Including a Translation of Thomas Hobbes, Dialogus Physicus De Natura Aeris* by Simon Schaffer (Princeton, N.J.: Princeton University Press, 1985), 115.

⁴⁶ Richard Nate, ““Plain and Vulgarly Express’d’: Margaret Cavendish and the Discourse of the New Science,” *Rhetorica* 19, no. 4 (2001): 404.

same contemporary scientific issues, the similarities seem to challenge the unflattering description of Cavendish's visit that has become so familiar.

For instance, the first experiment shown to Cavendish is notable not only for its relevance to contemporary debate, but also for the detail with which the secretary of the Royal Society records the event:

That of weighing the Air, which was done with a Glass-receiver, of the capacity of nine Gallons and three pints; which being Exhausted, and put into a scale, and then opened, and the air let in, did thereupon weigh One Ounce and seventy one Carats more than it did when exhausted.⁴⁷

Since Robert Boyle, who along with Robert Hooke had been charged with preparing the Duchess' entertainment, had been involved in a debate over the integrity and utility of his air pumps with Thomas Hobbes since 1661, it is highly suggestive that the very first item on his agenda was a successful demonstration of his device.⁴⁸ It is possible that Boyle was familiar with a passage in *The Blazing World* where the possibility of 'weighing the air' is questioned by the Empress: "Then came the lice-men, and endeavoured to measure all things to a hair's breadth . . . but their weights would seldom agree, especially in the weighing of air, which they found a task impossible to be done."⁴⁹ However, even if Boyle was unaware of this particular passage, the fact that he started with a demonstration of the pump's ability to weigh air, along with the care taken to record the results, suggests that Boyle recognized Cavendish as belonging to the camp of his adversaries and viewed her visit as an opportunity to respond to the wider circle of his

⁴⁷ Journal Book 3: 100-101.

⁴⁸ Shapin and Schaffer, *Leviathan and the Air-pump*, 111.

⁴⁹ Cavendish, *The Blazing World*, 159-160.

critics. Indeed, concluding the demonstration of his pump, the minutes of the meeting notes that Boyle “suggested afterwards that a Gage might be employed to know how much air is left.”⁵⁰ Clearly Boyle was familiar with his critics’ objections.

The next experiment shown to Cavendish, that of “several Experiments of mixing Colours,” is not recorded with the same detail that we saw in the case of Boyle’s pump, but is still significant when considered in the context of *The Blazing World* and her other scientific writings.⁵¹ As Colin Chamberlain has noted, Cavendish opposed the ideas of the early modern philosophers such as Descartes, Hobbes, and Locke who defined “sensuous colors [as] the properties material things visually appear to have when they appear to be colored . . . [while arguing that] bodies are *not* sensuously colored.”⁵² In her *Observations Upon Experimental Philosophy*, Cavendish argues against this view:

Colour, according to their opinion, is not inherent any otherwise in the object, but by an effect thereof upon us . . . But, good Lord! what a confusion would all this produce, if it were thus! . . . I wonder how rational men can believe that motion can be imparted without matter: Next, that all this can be done in an instant: Again, that it is the organ of the sentient that make colour, sound, and the like, and that they are not really inherent in the object itself. For were there no men to perceive such or such a colour, figure or

⁵⁰ Journal Book 3: 101.

⁵¹ Journal Book 3: 101.

⁵² Colin Chamberlain, “Color in a Material World: Margaret Cavendish against the Early Modern Mechanists,” *The Philosophical Review* 128, no. 3 (2019): 328.

sound; can we rationally think that object would have no colour, figure, nor sound at all?⁵³

One of the results of this debate was Cavendish objecting to the claims of the early modern philosophers “that colorless bodies are conceivable, that color is explanatorily idle, and that objects look to have changing colors as illumination conditions change.”⁵⁴ In *The Blazing World* we also see this debate manifest itself in an exchange between the Empress and the Worm-men:

The Empress . . . asked them further, whether minerals and all the other creatures within the earth were colourless? At which question they could not forbear laughing . . . for how is it possible, that a natural nothing can have a being in nature? If it be no substance, it cannot have a being, and if no being, it is nothing . . . and therefore your Majesty may firmly believe, that there is no body without colour, nor no colour without body; for colour, figure, place, magnitude, and body, are all but one thing, without any separation or abstraction from each other.

The Empress was so wonderfully taken with this discourse of the worm-men, that she not only pardoned the rudeness they committed in laughing at first at her question, but yielded a full assent to their opinion, which she thought the most rational that ever she had heard yet.⁵⁵

In this passage, Cavendish’s own opinions are imaginatively represented by her worm-men in an edifying discourse presented for the benefit of her protagonist. This is significant because many

⁵³ Margaret Cavendish, *Observations upon Experimental Philosophy*, edited by Eileen O’Neill, Cambridge: Cambridge University Press, 2004: 147-148.

⁵⁴ Chamberlain, 328.

⁵⁵ Cavendish, *The Blazing World*, 151.

of the claims regarding Cavendish's hostility towards the Royal Society cite instances in the novel where the Empress rebukes members of the Blazing World's scientific community as proof of her opposition to experimental philosophy, as Ian Lawson does when he examines the "implications of an Empress conversing with animal philosophers to illustrate both the epistemic and the political aspects of Cavendish's anti-experimentalism."⁵⁶ However, in this instance, we see the Empress representing views common to intellectuals of the day while the animal hybrids are the ones who correct the protagonist's misconception. As a result, this passage further demonstrates both the nuance of Cavendish's fiction and the degree to which her work drew on the contemporary scientific issues of her day.

While the particulars of the next demonstration—"two cold liquors by mixture made hot"—are left vague enough that it can safely be ignored, the fourth experiment receives a more detailed explanation: "Then the Experiment of making Water bubble up in the Rarifying Engine by draining out the air; And that of making an Empty bladder swell in the same Engine."⁵⁷ In this case, there is a passage in *The Blazing World* that not only resembles the experiment, but also contains a moment where the author explicitly calls on the experimental philosophers of her world: "They had an extraordinary art, *much to be taken notice of by experimental philosophers*, and that was a certain engine, which would draw in a great quantity of air, and shoot forth wind with a great force."⁵⁸ Here we see another example of Cavendish taking her familiarity with the mechanical experimentation of the mid-seventeenth century and applying it to her fictional world in a way that suggests her attitude towards experimental philosophy was more nuanced than the

⁵⁶ Lawson, 586.

⁵⁷ Journal Book 3: 101.

⁵⁸ Cavendish, *The Blazing World*, 128-129 (italics mine).

simple, single-minded opposition that she has often been credited with. And, while it might be tempting to take this demonstration as evidence that the members of the Royal Society were familiar with Cavendish's work and were answering her challenge, the fact that she was already familiar with the mechanics of such an experiment prior to her visit is enough to discredit the excessive awe and admiration reported by Pepys and Mintz.

The final two experiments recorded in the *Journal Books* of the Royal Society, “the Experiment of making a Body swim in the midst of the water” and “the two well-wrought Marbles which were not separated but by the weight of forty seven pounds,” are not particularly interesting except for the fact that the latter could be read as a further demonstration of the accuracy of the measuring instruments employed by the Society in response to the criticisms of Cavendish and others.⁵⁹ But what does need to be noted is that, while the minutes of the meeting list six experiments shown to Cavendish that day, several of the demonstrations that had been proposed a week earlier—“The dissolving of meat in Oyl of Vitriol”, “Some Magnetical Experiments”, and “A good Microscope”—are missing from the account of May 30 but *do* show up in Pepys' account: “Several fine experiments were shown her of colours, loadstones, microscopes, and of liquors among others, of one that did, while she was there, turn a piece of roasted mutton into pure blood, which was very rare.”⁶⁰ What are we to make of this? Did all the experiments take place as Pepys reports and the *Journal Books* simply failed to record them, or did Pepys exaggerate his account based on what was planned for the Duchess' visit a week earlier? While it is impossible to know for certain, it would be especially helpful to know whether an actual demonstration of a “good” microscope took place considering that

⁵⁹ Journal Book 3: 101.

⁶⁰ Journal Book 3: 99; Pepys, *Volume VIII*, 243.

“Cavendish’s reputation for hostility towards the Royal Society rests largely on her critical assessment of microscopy.”⁶¹ Most scholars who have taken up this argument point to the following passage in *The Blazing World* as an example of Cavendish’s attitude despite the fact that, as we have already seen, the Empress does not always represent the author’s views: “the Empress began to grow angry at their telescopes, that they could give no better intelligence; for, said she, now I do plainly perceive, that your glasses are false informers, and instead of discovering the truth, delude your senses; wherefore I command you to break them.”⁶² However, according to Wilkins, Cavendish’s objections were not “based on ignorance or childish folly” so much as an informed opinion of the instrument’s limitations in the seventeenth century: “Not only was she particularly well read on the subject . . . but she also had practical experience with the new scientific equipment . . . [and during the 1640s had, along with her husband,] acquired an impressive collection of microscopes and telescopes.”⁶³ Whether one chooses to credit Pepys’ expanded account of the meeting or not, what does seem clear is that Cavendish’s obvious and demonstrable grasp of the principles involved in seventeenth-century experimental philosophy as well as the manner in which she exploits that knowledge in the service of her fiction, effectively challenges the narrative of her visit to the Royal Society as a case of the scientific establishment humoring an eccentric and uninformed dilettante.

Conclusion

⁶¹ Wilkins, 247.

⁶² Cavendish, *The Blazing World*, 141.

⁶³ Wilkins, 247.

Margaret Cavendish has always had her detractors. Virginia Woolf once famously described her thought as a “vision of loneliness and riot” while, more recently, Christopher Koester has argued that Cavendish “sought to create her own cult, where her egotism and charm . . . serves as a unifying force.”⁶⁴ Though it was outside the scope of this paper to consider Cavendish’s entire biography and corpus, at least in the matter of her visit to the Royal Society, the unflattering and oft-cited account provided by Samuel Pepys’ diary is not supported by the available evidence. Additionally, it seems clear that, far from being an awe-struck amateur, Cavendish was well-versed in the theory behind the demonstrations provided; while, finally, the nature of the experiments chosen by Robert Hooke and Robert Boyle suggest they were aware that the Duchess of Newcastle was numbered among their critics. Taken together, all of these examples challenge the notion of an underlying hostility between Cavendish and the Royal Society which, as we have seen, is largely based on an unjustified characterization of her visit as well as a selective reading of *The Blazing World*. It is hoped that, by correcting some of the misconceptions surrounding the Duchess’ visit, a more accurate and nuanced narrative concerning Cavendish’s relationship towards experimental philosophy might emerge.

⁶⁴ Virginia Woolf, *A Room of One’s Own and Three Guineas*, edited by Michèle Barrett, London: Penguin Books, 1993: 56; Christopher Koester, “Canonizing Margaret Cavendish: On the Creation of a Cult and Its Idol,” *Exemplaria* 31, no. 3 (2019): 214.

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