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Article abstract

This article reveals that John Milton employed an allusion to the aurora borealis in book 6 (79–83) of *Paradise Lost*, unrecognized in more than three centuries of scholarly analysis. Two other likely allusions, and one certain, to the aurora have also been identified. This research casts doubt on the long-held belief, made popular by the astronomer Edmund Halley (1656–1742), that no notable aurora was visible in England in the seventeenth century. After examining an overlooked note by the English historian William Camden (1551–1623), this article explores the possibility that Milton actually saw an aurora. A solution is also presented here to the long-standing conundrum of the comet near the “Arctic” constellation Ophiuchus in book 2 (707–11) of *Paradise Lost*.

Milton's *Paradise Lost*: Previously Unrecognized Allusions to the Aurora Borealis, and a Solution to the Comet Conundrum in Book 2¹

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This article reveals that John Milton employed an allusion to the aurora borealis in book 6 (79–83) of Paradise Lost, unrecognized in more than three centuries of scholarly analysis. Two other likely allusions, and one certain, to the aurora have also been identified. This research casts doubt on the long-held belief, made popular by the astronomer Edmund Halley (1656–1742), that no notable aurora was visible in England in the seventeenth century. After examining an overlooked note by the English historian William Camden (1551–1623), this article explores the possibility that Milton actually saw an aurora. A solution is also presented here to the long-standing conundrum of the comet near the “Arctic” constellation Ophiuchus in book 2 (707–11) of Paradise Lost.

Cet article révèle que John Milton fait allusion à une aurore boréale au sixième livre (79–83) de Paradise Lost, allusion qui est restée ignorée pendant plus de trois siècles de lectures savantes. Une autre allusion à une aurore boréale, ainsi que deux autres, probables, ont été identifiées. Cette recherche remet en question l'opinion tenue de longue date, et circulée par l'astronome Edmund Halley (1656–1742), qu'aucune véritable aurore boréale ne put être observée en Angleterre au dix-septième siècle. Grâce à l'analyse d'une note, longtemps négligée, de l'historien anglais William Camden (1551–1623), cet article explore la possibilité que Milton ait pu réellement observer une aurore boréale, ce qui pourrait alors résoudre l'énigme de la mention, au deuxième livre du Paradise Lost (707–711), d'une comète près de la constellation « arctique » Ophiuchus.

1. Thanks to John Leonard (University of Western Ontario) who confirmed for me that no previous scholar had detected Milton's allusion to the aurora in book 6 (79–83). I am also indebted to him for his confirmation that my resolution of the comet conundrum is correct, and for his cogent explanation of what scholars have thought until now about the passage in book 6. Thanks also to Dana Sutton (University of California, Irvine) for his insights into William Camden scholarship; to comet experts Donald Yeomans (Jet Propulsion Laboratory) and David Seargent who confirmed the comet of 1618 was never in Ophiuchus; and to Douglas Rogers for his insights into the auroral passage in book 2. Matt Emanuele, Marion Dolan, and Peter Broughton also offered their expertise in polishing the linguistics of the paper.

Introduction

The expression “aurora borealis” was coined by Galileo Galilei (1564–1642) in 1619, when he wrote, in Italian, “boreale aurora.” The passages in parentheses are the original Italian:

And I know, Academicians, that many of you will have seen more than once the sky at nighttime illuminated in its northern parts in such a way that its brightness yields nothing to the brightest dawn (aurora) and closely rivals the sun—an effect which in my opinion has no other origin than that a part of the vapor-laden air surrounding the earth is for some reason unusually rarified, and being extraordinarily sublimated has risen above the cone of the earth’s shadow so that its upper parts are struck by the sun and made able to reflect its splendor to us, thus forming for us this northern dawn (questa boreale aurora).²

The French astronomer and philosopher Pierre Gassendi (1592–1655) subsequently used the term, and thus it is widely but erroneously attributed to him. In 1621 Gassendi observed the spectacle of the “northern lights” as it is popularly known even today. It was his report on this remarkable event in publications of 1641, 1649, and 1658 (posthumously) that began the scientific study of the celestial phenomena known as the aurora borealis.³ Milton refers to Galileo three times in *Paradise Lost*,⁴ and Galileo himself also witnessed the aurora of 1621 while in Venice.⁵

2. Galileo Galilei, *Discourse on the Comets*, in *Le opera de Galileo Galilei*, Edizione Nazionale, 2nd ed., vol. 6 (Florence: Giunti Barbera, 1929–32), 44. English translation by S. Drake and C. D. O’Malley, *The Controversy on the Comets of 1618* (Philadelphia: University of Pennsylvania, 1960). The final section in parentheses is translated by George Siscoe (see note 3). The original Drake and O’Malley translation is “the aurora borealis,” but Siscoe prefers the literal translation because it is employed by Galileo as a metaphor, not as a name given to a phenomenon as is now the common usage. The golden colour of the aurora mentioned in this paper was also noted by Galileo in *Le Opera*, 2:281.

3. George L. Siscoe, “An Historical Footnote on the Origin of ‘Aurora Borealis,’” *History of Geophysics* 2 (1986): 11–14.

4. Justin Clemens, “Galileo’s Telescope in John Milton’s *Paradise Lost*: The Modern Origin of the Critique of Science as Instrumental Rationality?” *Filozofskivestnik* 23 (2012): 163–94.

5. Harald Falck-Ytter, *Aurora: The Northern Lights in Mythology, History and Science* (Edinburgh: Floris, 1999), 54.

From the time of Aristotle onwards, comets, meteors, and the Milky Way were all treated as meteorological (that is atmospheric) phenomena that referred to a stationary, central earth. A foison of other effects was grouped with these under the names “goats,” “torches,” and “chasms.” All these phenomena were thought to be fires in the upper air fueled by exhalations rising from the earth.⁶ There is some debate as to whether Aristotle was referring to clouds or the aurora, but Milton was certainly familiar with Aristotelian physics from his undergraduate studies at Cambridge.⁷ Whatever Aristotle’s original meaning, there is no real question that a substantial number of commentators and popularizers before and during Milton’s lifetime referred to the aurora using this vocabulary.⁸ This article will examine in particular the work of the Puritan theologian and academic William Fulke (1538–89), who first wrote about the aurora in 1563.⁹

6. Aristotle, *Meteorologica*, trans. H. D. P. Lee (Cambridge, MA: Harvard University Press, Loeb Classic Library, 1952), 12. See book 1, parts 4 and 5. Another important source is the pseudo-Aristotelian *De mundo*, 2:392b1–5. The Jesuit Cabeus wrote a voluminous commentary on the *Meteorologica*. As it was published in 1644, it may have come to Milton’s attention.

7. For an excellent recent summary of Aristotle’s thoughts on this, see Malcolm Wilson, *Structure and Method in Aristotle’s Meteorologica* (Cambridge: Cambridge University Press, 2013), 126–32. For an assessment of Aristotle’s position in the curriculum of Cambridge, see Edward Baldwin “An Instance of Milton’s Debt to the Greek Philosophers,” *The Classical Weekly* 11 (1918): 121–25. On the type of Aristotelianism Milton rejected or accepted, see N. K. Sugimura, “The University Years,” in *Matter of Glorious Trial* (Princeton: Yale University Press, 2009), 1–39.

8. Vladimir Janković, *Reading the Skies: A Cultural History of English Weather, 1650–1820* (Manchester: Manchester University Press, 2000). See particularly the chapter “Public Meteors,” 55–67.

9. William Fulke, *A Goodly Gallerye with a Most Pleasaunt Prospect, into the garden of natural contemplation, to behold the natural causes of all kynde of Meteors* (London: William Griffith, 1563). See also *A Defence of the Sincere and True Translations of the Holy Scriptures into the English Tongue by William Fulke*, ed. Charles Henry Hartshorne (Cambridge: Cambridge University Press, 1843). At the time Hartshorne was writing, he was unaware of any copy of the 1563 edition, but Worldcat lists three copies in institutional collections (all in the United States). He lists editions in 1571 and 1634, noting that “the 1640 edition is styled the third.” (Hartshorne, 1843, vi). In all there were nine editions of *A Goodly Gallerye* from 1563 to 1670, but it was reissued under another name in 1640: *Meteors, or a Plain Description of all kinds of Meteors*. See also Andrei Dorian Gheorghe and Alastair McBeath, “Meteor Beliefs Project: A Goodly Gallerye—William Fulke’s ‘Meteors,’” *Journal of the International Meteor Organization* 35 (2007): 23–28.

Milton's allusion to the aurora in book 6

John Milton likely wrote most of the epic poem *Paradise Lost* between 1658 and 1663, although it was not published until 1667. In book 6, Milton wrote this about the war in heaven and the advance of Satan's host:

Farr in th' Horizon to the North appeer'd
 From skirt to skirt a fierie Region, stretch
 In battailous aspect, and nearer view
 Bristl'd with upright beams innumerable
 Of rigid Spears. (6.79–83)¹⁰

The following sections establish its connection to an aurora:

Farr in th' Horizon to the North

Milton begins with “Farr in th' Horizon to the North,” which is a description of where the aurora borealis emanates—hence its popular name, “northern lights.” It also reflects the accounts of John Stow (1525–1605)¹¹ and William Camden,¹² who describe the aurora beginning in the north, which was regarded in this superstitious age (especially because of Ezekiel 38:1–9 and Isaiah 14:12–14) as the Devil's quarter; lights and armies in the northern sky would elicit terror in the sixteenth and seventeenth centuries, precisely because they appeared in the north.¹³ Ezekiel 38 talks about the enemies of God in “the north quarters,” and Isaiah 14:12–14 reads:

How art thou fallen from heaven, O Lucifer, son of the morning! how art thou cut down to the ground, which didst weaken the nations! For thou hast said in thine heart, I will ascend into heaven, I will exalt my throne

10. John Leonard, ed., *Paradise Lost* (London: Penguin Classics, 2014). Subsequent passages quoted from *Paradise Lost* are from this edition, and will appear by book and line number in parentheses in the main text.

11. John Stow, *Annales, or, A General Chronicle of England* (London: Richardi Meighen, 1631), 598.

12. William Camden's account of the aurora is found in William Whiston, *An Account of a Surprizing METEOR Seen in the AIR, March the 6th, 1715/16, at Night* (London: J. Senex, 1716), 7.

13. William E. Burns, *An Age of Wonders: Prodigies, Politics, and Providence in England, 1657–1727* (Manchester: Manchester University Press, 2002), 97–124.

above the stars of God: I will sit also upon the mount of the congregation,
 in the sides of the north: I will ascend above the heights of the clouds; I
 will be like the most High.¹⁴

Skirt to skirt

The third sense of the word “skirt” in Samuel Johnson’s dictionary is “edge, margin, border, extreme part.” To illustrate this meaning of the word, Johnson (who elides the word “exhalations”) quotes Milton thus: “Ye mists and exhalations, that now rise / From hill or steaming lake, dusky or grey, / Till the sun paint your fleecy skirts with gold, / In honour to the world’s great Author rise” (5.185–88).¹⁵ Therefore, we can interpret Milton’s use of “from skirt to skirt” as meaning that the aurora, which emanated from the north, stretched across the entire sky in that direction. The lower portion of the aurora also typically takes on the appearance of a skirt with its sinuous curves. It is possible Milton read the account written by Galileo quoted at the beginning of this paper, and gave it a poetic interpretation.

Fierie Region

An aurora pulsating and changing in brightness gives the appearance that the sky is on fire. This effect is particularly so when the aurora radiates a fiery red, although the lights often exhibit a variety of vibrant colours. Lucan calls it a “fire, flickering in the heavens.”¹⁶ And of course “fierie region” also evokes images of Satan’s dominion.

Battailous aspect

There was a strong connection between aurorae and battles in the sky; Milton was well aware of these spectral battles from the English Civil War era and earlier. The title page of the 1628 pamphlet *Looke Up and See Wonders* (Figure 1) depicts heavenly artillery and armies battling in the sky, with a large beam

14. All biblical quotes in the paper are from the King James Version. The reference to Lucifer falling to the ground in Isaiah 14:12 is the “sole unequivocal” mention of a falling star (meteor) in the Old Testament, according to Alastair McBeath, “Meteors, Comets, and Millennialism,” *Journal of the International Meteor Organization* 27 (1999): 318–26.

15. Samuel Johnson, *A Dictionary of the English Language*, vol. 2, 8th ed. (London: J. Johnson, 1799).

16. Lucan, *The Civil War* (Cambridge, MA: Harvard University Press, Loeb Classical Library, 1928), 41–42.

of light projecting from the heavens.¹⁷ A pamphlet was published in January 1643 shortly after the Battle of Edge Hill reporting the spectacle of just such an event.¹⁸ A vision related in another book (published at the same time Milton was writing *Paradise Lost* in 1659) described two fiery pillars that appeared in the sky “and between these two Pillars intervened several armed Troops and Companies in Battail array.”¹⁹ As Leonard notes about the passage (2.538) considered below, “The two pillars, appearing opposite ends of the sky, offer a particularly suggestive context for Milton’s line: ‘From either end of heaven the welkin [sky] burns.’”²⁰ These pillars can now be understood as allusions to auroral pillars.

The issue of how people comprehended and tried to make sense of the character and origin of puzzling phenomena in the sky—in the absence of science to adequately explain apparitions or prodigies such as armies fighting—has been examined by Stuart Clark.²¹ He notes that the boundaries between the natural and non-natural, divine and demonic, real and illusory, were themselves highly unstable, porous, and fluid. Such was the case in the century in which Milton lived, but even then the groundwork was being laid to cast aside these superstitions. Gassendi stated confidently that “we know what to think of the common stories of armies, and battels, and weapons, and shields, & seen in the

17. *Looke Up and See Wonders. A miraculous Apparition in the Ayre, lately seene in Barke-shire at Bawklin Greene neere Hatford Apr. 9th. 1628* (London: printed for Roger Michell, 1628). This text describes the fall of a stone from the sky, a meteorite in modern terminology. See Patricia Jane Bouk, *The Void of Meaning: The Sky in Early Seventeenth Century English Pamphlets* (Master of Arts thesis, University of British Columbia, 1993).

18. “A great wonder in Heaven: Shewing the late *Apparitions* and *Prodigious* noyses of *War* and *Battails* seen on *Edge-hill* near *Keynton* in *Northampton-shire*” was certified by William Wood, Justice of the Peace for the same County, and by Samuel Marshall, Preacher in Keinton.

19. *The Five Strange Wonders in the North and West of England* (London, 1659). This account is reminiscent of an aurora over Bohemia on 12 January 1570 where people saw two great pillars in the sky, one in the east and the other in the north, “with fire running down the two pillars from the clouds above like drops of blood.” It was described as both a “gruesome spectacle” and a “miraculous sign from God.” See Robert Eather, *Majestic Lights: The Aurora in Science, History, and the Arts* (Washington, DC: American Geophysical Union, 1980), 43.

20. John Leonard, “‘To Warn Proud Cities’: A Topical Reference in Milton’s ‘Airy Knights’ Simile (*Paradise Lost* II.531–8),” *Renaissance and Reformation* 19 (2005): 63–71.

21. Stuart Clark, *Thinking with Demons* (Oxford: Oxford University Press, 1999).

air; and so esteem them as fables.”²² This was conveniently ignored by many Protestant ministers in England, however, who continued to acknowledge that prodigies of all kinds could be a medium for conveying messages from heaven.²³ Milton capitalized on this, as his calculated employment of a comet (2.707–08) and the aurora (6.79–83) in close conjunction with his evocation of the name of Satan and Satan’s host makes clear.

This reference to “bataillous aspect” from Gassendi’s apologetic account of the 1621 aurora is typical of the superstitious interpretation attached to its appearance by the less educated:

For there did not want those who spread it about, that what we saw in no other Form than that of Vapours, was the Appearance of Armies in Battel-Array, Marching, and Fighting; that Guns, Bullets, Shots, Spears, and other such Things, which I am ashamed so much as to name, were seen at the same Time.²⁴

Beams and Spears

The father and son team, Jonathan Richardson, gave an analysis of *Paradise Lost* in 1734. Referring to 6.79–83 (quoted above), they see a pun drawn from the Teutonic languages, where “beam” is considered to be both a wooden beam and a light beam. The early nineteenth-century scholar Henry John Todd²⁵ explains that the Latins express the word bristled by *horrere*, taken from the bristling of a wild boar’s back.²⁶ The Richardsons equate this bristling with upright spears: “Horrent, Bristled, the Stiff Spears as bristles stood up, and shining, seem’d

22. Pierre Gassendi, *Physics*, Section 3, membrum prius, Liber II, de vocatis uuglo meteoris, tome II (1658), 107–08. His account of the aurora from this book is translated into English by William Whiston in *An Account of a Surprising METEOR*, 8–14. The quote from Gassendi is in Whiston, 13. The 1658 text is also the same version Edmund Halley used; see note 94.

23. Alexandra Walsham, *Providence in Early Modern England* (Oxford: Oxford University Press, 1999), 178.

24. Gassendi earlier used this passage in his book *Animadversions* (Lugduni: G. Barbier, 1649). It is possible Milton encountered this description of the aurora. See note 22.

25. Henry John Todd, *The Poetical Works of John Milton*, vol. 2 (London: C. and J. Rivington, 1826), 461.

26. For example, in Virgil, *Aeneid*, 11.610. J. G. Cooper, *The Works of Virgil* (New York: Sheldon, 1866), 554.

Upright Beams.”²⁷ Richard Bentley considers the beams to be shafts of light only,²⁸ while modern scholars take the opposite view. According to John Leonard in his edition of *Paradise Lost*, the initial sense of beams as “rays of light” changes to “shafts of spears.”²⁹ Satan promises a new morning, but brings only war.

The *Oxford English Dictionary* has no instance of “beam” meaning “spear,” but it was used in this sense in 1590 by Edmund Spenser (1552–99):

His speare amidst her sun-broad shield arrived;
Yet nathermore the steele a sunder rived,
All were the beame in bignesse like a mast.³⁰

A second precedent comes from the Bible:

And the staff of his spear was like a weaver’s beam; and his spear’s head weighed six hundred shekels of iron: and one bearing a shield went before him. (Samuel 17:7)

Roy Flannagan says the use of “beam” in book 6 is “Not ‘beam’ in the sense of ‘sunbeam,’”³¹ and David Kastan agrees the reference is to wooden shafts (“Milton’s angels have weaponry”).³² The original sense of beam in all Teutonic languages was “tree,” but the *OED* notes that an extension to “beam of light” arose in Old English, so the pun noted by the Richardsons has merit.

This philological issue of spears and wooden beams recurs again in *Paradise Lost*, in what Christopher Eagle terms the “simile of Satan’s spear.”³³ Here it is clear that the spear Milton refers to is wooden:

27. Jonathan Richardson, father and son, *Explanatory Notes and Remarks on Milton’s Paradise Lost* (London: James, John and Paul Knapton, 1734), 250.

28. Richard Bentley, *Milton’s Paradise Lost* (London: Jacob Tonson, 1732).

29. See note 10 for details of Leonard’s edition.

30. Edmund Spenser, *The Faerie Queene*, 3.7.40, in *The Complete Works in Verse and Prose of Edmund Spenser*, ed. R. S. Bear (London: Grosart, 1882), vol. 6, 277.

31. Roy Flannagan, *The Riverside Milton* (Boston: Houghton Mifflin, 1998), 510.

32. David Kastan, ed. and intro., *Paradise Lost* (Indianapolis: Hackett, 2005), 182.

33. Christopher Eagle, “‘Thou Serpent that Name Best’: On Adamic Language and Obscurity in *Paradise Lost*,” *Milton Quarterly* 41 (2007): 183–94, 190.

His spear, to equal which the tallest pine
 Hewn on Norwegian hills, to be the last
 Of some great ammiral, were but a wand,
 He walked with to support uneasy steps (1.292–95)

But Eagle goes further: “Following the sequence of the vehicle (Spear → Tree → Mast of Ship) with the Satanic context in mind, one finds an intriguing similarity between the tenor of the spear simile and the various definitions for the Latin word *Malus*: (1) evil, troubles (2) apple tree (3) mast of a ship.”³⁴ In this interpretation, the use of spears in the passage in book 6 is another evocation of evil, which certainly is appropriate as the “innumerable spears” are brandished by none other than Satan’s host.

The passage under discussion from book 6 may also harken back to 1.596. Arising as a false dawn in the north, Lucifer, son of the morning, is not yet “Shorn of his Beams” but his “Upright Beams” harden into “Horrent [...] Bristles.”³⁵ Leonard offers this current interpretation of Milton’s passage in book 6:

The sky and horizon in question are not on our earth or even in our universe. Satan’s army is marching from the north of *heaven*, which has no sun, but is instead illumined by light from a cave under God’s throne. Dawn in heaven would therefore arise in the south from the perspective of a northern observer (assuming God’s throne is central). Satan’s false dawn (the light of weaponry) is therefore all the more confrontational for taking the southern dawn head-on (north being opposite to south). Satan marches from the north in accordance with Isaiah 14.12, where Lucifer aspires to sit in God’s throne by raising rebellion in the sides of the north.³⁶

The Isaiah text is “one of the most important for the identification of the Devil as the agent of evil in history, as the Christian Fathers constructed him, and especially for the story of his fall from heaven.”³⁷ While it may be tempting

34. Eagle, 191.

35. John Leonard, *Faithful Labourers: A Reception History of Paradise Lost, 1667–1970*, vol. 1: Style and Genre (Oxford: Oxford University Press, 2013), 34.

36. John Leonard, private communication, 2014.

37. Neil Forsyth, *The Satanic Epic* (Princeton: Princeton University Press, 2003), 63.

to go further in linking the passage with auroral imagery by noting that Lucifer was the son of the deity Aurora, there is no tradition specifically linking Satan with the goddess Aurora. Lucifer is in fact a common name for the planet Venus as a morning star (*fer* = to bear or bring; *lux, lucis* = light) in Latin literature (e.g., Ovid, *Metamorphoses* 2.112) and is used in the Vulgate to translate the Hebrew *Helel ben Shahar* (bright one son of the dawn).³⁸

In a book by Fulke describing the aurora, we find this explanation based on the concept of “exhalation” that originated with Aristotle who claims there are two kinds of exhalations from the earth: a cool, moist kind from which clouds form, and a dry, hot kind that is light and rises to the top where it is subject to kindling into flame.³⁹

Of burning beames. These are caused when the exhalation being long and not very broad, is sett on fire, all at once and so burneth lyke a greate beame or logge. The difference of beames and pyllers is this, for beames are when they seeme to lie in lengthe, in the aire, but they are called pillers, when they stande right up, the one end nearer to the earth, then the other.⁴⁰

Here we see a direct connection between “beame” and “logge” in a discussion of the auroral light. Milton’s use of “exhalations” is also salient. Adam and Eve at 5.185 actually say “Ye mists and exhalations that now rise,” the exact phraseology used by Fulke in his explanation of how an aurora originates. Indeed, Milton often uses it in just the sense given by Fulke as derived from Aristotle (who probably observed the aurora of 349 and 344 BC): 1.711, 5.185, 5.421, 5.425, 10.694, 11.741. The term exhalation itself conveyed a sense of potential evil, for it could turn into meteor (aurora), comet, or lightning.⁴¹ This use of “exhalation” is further evidence—hitherto unnoticed—that Milton was employing the same terminology used to explain the aurora. (The origin of the word “meteor” is examined below.)

38. John Leonard, *Naming in Paradise* (Oxford: Clarendon Press, 1990), 127.

39. Aristotle, *Meteorologica*, book 2, chapters 4 and 5. See also note 6.

40. Fulke, *A Goodly Gallerye*, 12.

41. Kester Svendsen, *Milton and Science* (Cambridge, MA: Harvard University Press, 1956), 87.

Additionally, the word “trabes” used by Pliny to denote the aurora means literally “the great beams, *travi*, of the roof.”⁴² Milton says the beams are upright, while for Fulke an upright beam is more properly called a pillar (as in the 1659 event). It is a distinction Milton could have ignored if he was in fact making a pun about wood and light beams, as the Richardsons claimed. Thus the “beams” in 6.79–83 were clearly meant in the first instance as light beams, and this analysis shows they were not just a literary pun but a description of a physical phenomenon. It must also be noted that modern scholars who are not astronomers are prone to conflating Fulke’s descriptions of the aurora and comets. Ann Geneva, for example, includes “burning Beames and round Pillars” in her list of the fanciful shapes comets can exhibit.⁴³

Chroniclers in England mentioned *lancearum* (derived from the Latin *lancea*, “light spear”) in the air as early as 555.⁴⁴ In the *Anglo-Saxon Chronicle* from the year 979 we read: “That same year was seen a bloody cloud, oftentimes in the likeness of fire; and it was mostly apparent at midnight, and so in various beams was coloured.”⁴⁵ While it is unlikely Milton knew of this and other accounts in the *Chronicle* (the first proper edition of it did not appear until 1692), it shows that people in England described the aurora in terms of beams and spears from very early times.

Modern scholarly consensus is that 6.79–83 is understood entirely in a biblical context, with an overlapping pun derived from the Teutonic languages. However, Milton was capable of multiple allusions in the same passage; according to the evidence that informs this article, he was referring here principally to the aurora borealis, which resides “in the sides of the north.” No seventeenth-century reader of *Paradise Lost* familiar with the contents of Aristotle’s *Meteorologica* would express astonishment about what Milton meant in 6.79–83. Milton’s reference to beams and spears suggests that the passage is more correctly understood as a description of what we now call an aurora. This

42. Pliny, *The Natural History*, trans. John Bostock and Henry Thomas Riley (London: Taylor and Francis, 1855), 60.

43. Ann Geneva, *Astrology and the Seventeenth Century Mind: William Lilly and the Language of the Stars* (Manchester: Manchester University Press, 1995), 90.

44. Robert Pensey, “Aurora Borealis at Sunderland,” *Annals of Philosophy* 9 (1817): 250. This appearance of an aurora is attributed to “Matthew of Westminster,” a name erroneously given to some of the continued texts of the *Flores Historiarum*, mostly by Matthew Paris.

45. John Jeremiah, “Early Mention of the Aurora Borealis,” *Nature* 3 (29 December 1870): 174–75.

was realized in the 1940s by Alan Dugald McKillop, but not followed up by subsequent Milton scholars: “Burning spears, streams, or darts” were regular terms for the northern lights. This imagery, learned and popular, underlies the passages in the Elizabethan dramatists and in Milton.⁴⁶ As an example, McKillop quotes this passage from *Paradise Lost* (6.15–18):

all the Plain
Cover'd with thick embattl'd Squadrons bright,
Chariots and flaming Arms, and fiery Steeds
Reflecting blaze on blaze.

Milton's sources for the auroral passage in book 6

Even if he did not actually see an aurora, written sources were fertile ground for Milton's knowledge of the northern lights embodied in the six lines of book 6. He knew this passage by Lucan:

[...] the menacing gods filled the earth, sky, and sea with portents. The darkness of night saw stars before unknown, the sky blazing with fire, lights shooting athwart the void of heaven, and the hair of the baleful star—the comet which portends change to monarchs. The lightning flashed incessantly in a sky of delusive clearness, and the fire, flickering in the heavens, took various shapes in the thick atmosphere, now flaring far like a javelin, and now like a torch with fan-like tail.⁴⁷

The word *iaculum*, translated as “javelin,” refers to a light spear. Here we once again see “spear” being used to describe one visual aspect of the aurora, and we also see a comet being described as a portent intermixed with a description of the aurora. In the case of the comet, Lucan mentions its “hair” (comet literally means “haired” as it derives from Greek through Latin for a hairy star, *stella crinita*), and Milton also uses the term “hair” in the passage just quoted from

46. Alan McKillop, *The Background of Thomson's Seasons* (Minneapolis: University of Minnesota, 1942), 65.

47. Lucan, *The Civil War*, trans. Brian Walters (Indianapolis: Hackett, 2015), 15. See book 1, 524–32.

book 2. The word “fire” employed by Lucan also appears in Milton’s description of both comet and aurora.

Looking back to the sixteenth century, we can also identify other sources Milton likely employed. He read the work of the Scottish chronicler Hector Boece (1465–1536), who relates this spectral battle featuring “spears in the air,” from 839 CE: “Offt times wes sene in Ye nicht ane fyry ordinance of armit men rusching Togidder with speres in Ye air.”⁴⁸ Harkening back to the “spear-ship mast” relationship noted by Eagle, Boece also relates this auroral appearance of spears and ships from 93 CE: “Mony birnard spieris apperit, shottand in Ye air [...] Ane grete noumer of schippis wer seen in Ye air.”⁴⁹

The English historian William Whiston (1667–1752) quotes the accounts of English aurora from two sources familiar to Milton (he cites from them in his commonplace book), namely John Stow and William Camden. Stow records spectacular auroral appearances in 1564 and 1574:

The 7th of October [1564] at Eight of the Clock at Night, the North part of the Element seemed to be covered with Flames of Fire; proceeding towards the Middle of the Firmament: where, after it had stay'd nigh one Hour, it descended West; and all the same Night, being the next after the Change of the Moon, seemed as Light as it had been Day.

The 14 of November [1574], being Sunday, about midnight divers strange impressions of fire & smoke were seen in the air to proceed forth of a black cloud in the North towards the South, which so continued till the next morning, that it was daylight. The next day following, the heavens from all parts did seem to burn marvellous ragingly; and over our heads the flames from the horizon round about rising did meet; and there double and roll one in another, as if it had been in a clear Furnace.⁵⁰

Camden describes the 1574 appearance as follows: “The Clouds flamed with Fire, in the Month of November, streaming from the North, toward the South.

48. Hector Boece, *Scotorum historiae a prima gentis origine* (Paris: Badii Ascensii, 1526). The spectral battles are quoted in Neil Bone, *Aurora: Observing and Recording Nature's Spectacular Light Show* (New York: Springer, 2007), 106.

49. Boece quoted in Bone, 106.

50. Whiston, 6–7. See Vladimir Jankovic, “The Politics of Sky Battles in Early Hanoverian Britain,” *Journal of British Studies* 41 (2002): 429–59.

And the next Night the Heaven seemed to Burn; the Flames arising from the Horizon round about, and meeting in the Vertical Point.” And Fulke is quite explicit that on 30 January 1560 “burning spears” were seen over London: “In the north where this cloud burned, it was as light as when the daye breaketh [...] The edge of this cloude was in fashion lyke the Raynbowe, but in colour very bright, and often tymes casting forth almoste innumerable dartes, of wonderful legth.”⁵¹

Robert Eather⁵² suggests that the aurora of 1574 or a later one of 1583 was seen by Shakespeare, leading to an auroral allusion in the play *Julius Caesar* (2.19): “Fierce fiery warriors fought upon the clouds.” The most cited work in the 1630s and 1640s, when Milton was still reading, is *Meteora* by Libertus Fromondus (1587–1654).⁵³ He described *meteora* as being phenomena produced by vapour (rain, etc.), or by exhalation (fiery, as lightning and falling stars), or by both (clouds).⁵⁴ And John Swan writes extensively about meteors, specifically linking this term with what would later be known as the “northern lights.” Here he uses several terms Milton employed in *Paradise Lost* to denote the aurora (fiery spears, exhalations, and streaming):

[...] this Meteor is thus generated [...] kindling the thin Exhalations which shoot out in great number like to fierie spears or darts, the streaming of slashing being so much the whiter by how much the Exhalation is the thinner. Such like coruscations as these we use to see many nights in the North and North-east parts of the skie.⁵⁵

Thus, Milton had ample literary fodder to fire his imagination.

Even when the nature of the aurora was at least partially understood, it still inspired primal instincts in the minds of enlightened men. The artist

51. Fulke, *A Goodly Gallerye*, 9.

52. Eather, 187.

53. Libertus Fromondus, *Meteorologicorum libri sex* (Louvain: H. Nempaeus, 1646). Fromondus was a critic of the 1637 book *Meteors* by Rene Descartes, which dealt mainly with the nature of salt, the causes of wind and thunder, the figures of snow, and the colours of the rainbow.

54. Falconer Madan, *Oxford Books: The Early Oxford Press, 1468–1640* (Oxford: Clarendon Press, 1895), 213.

55. John Swan, *Speculum Mundi; or, a Glasse Representing the Face of the World*, second edition enlarged (Cambridge: Roger Daniel, 1643), 85.

William Morris told Georgiana Burne-Jones what he felt upon seeing the aurora on 19 August 1880. It was, he wrote, “very mysterious and almost frightening.”⁵⁶ Thus it is not surprising to find superstitious views attached to the aurora many centuries ago. Even in modern times, we find in the 1914 Angel of Mons episode from World War I an example of a luminous cloud and angelic warriors appearing at a decisive moment of battle.⁵⁷

Other allusions to the aurora in *Paradise Lost*

Three additional passages in *Paradise Lost* also contain allusions to the aurora. The first two passages quoted here are very probable, while the third is certain. This reading does not diminish or negate previous scholarly interpretations of these passages, but suggests that Milton's full meaning, often obscured by allusion or simile, has not been fully recognized due to inaccurate preconceptions.

(1) One allusion to an aurora depends on a careful analysis of the term meteor. In England the aurora was previously called a “meteor,” the word now used for a rocky object that produces a trail of light as it heats up in the atmosphere. The first usage of the word meteor in English to describe the “lights in the sky” appeared in the fifteenth century. It derives from Middle English *metheour*, from Middle French *meteore*, from Medieval Latin *meteorum*, from Greek *meteōron*, from neuter of *meteōros* (high in the air), from *meta* (*beyond*) + *eōros* (“a hovering in the air”). A Miltonic instance of this sense occurs at 12.629: “Gliding meteorous, as Ev'ning Mist.” Milton uses the term “shooting star” (4.556) or “falling star” (1.745) to distinguish a meteor (the rocky object) from the aurora, but the instance cited here with the word “meteorous” specifically equates it with mist, and is thus of a different character and intent.

In his influential book on meteors, Fulke exhibits an inconsistent approach to superstition. On the one hand he was a founder of scientific meteorology in England. Employing his interest in both astronomy and optics, he reduces superstition by emphasizing secondary over supernatural causes in his book, and

56. Norman Kelvin, *The Collected Letters of William Morris* (Princeton: Princeton University Press, 1986), 1:583.

57. David Clarke, *The Angel of Mons: Phantom Soldiers and Ghostly Guardians* (Hoboken: Wiley, 2004), 117.

he also opposes the practice of astrology.⁵⁸ On the other hand, Fulke promotes his own agenda of superstition. For him, the ultimate purpose of meteors was to “threaten [God’s] vengeance, to punishe the world, to move to repentance.”⁵⁹

(2) The second allusion to an aurora links meteors with Satan’s majesty. On the Imperial Ensign, Milton writes at 1.537–38 that it “Shon like a Meteor streaming to the Wind / With Gemms and Golden lustre rich imblaz’d.” Milton scholars consistently conflate “meteor” with “shooting star.” For example, Malakiba Sarkar uses “like a meteor streaming to the wind” as an example of Milton comparing Satan to “falling stars,” and the same error was made by Andrei Dorian Gheorghe and Alastair McBeath.⁶⁰ While this passage is also equated by Alastair Fowler with the description of a comet,⁶¹ it is much more likely another auroral allusion. The word “streamers” was associated with the appearance of a meteor before Milton began writing *Paradise Lost*. After quoting a biblical passage (“shine like the brightness of the heavens,” Daniel 12:3), the bishop of Winchester, Lancelot Andrewes (1555–1626), writes: “The streams of righteousness shining from the Firmament, as streaming and issuing from the impressions and meteors of the Aire; or whether we say, that it streamed from the Heavens, and from Gods glorious Majesty, as light did to the Israelites out of the Pillar.”⁶² This sermon incorporates a direct linkage of a meteor “shining and streaming” to both God’s majesty and the imagery of a “pillar.” It represents a likely source for Milton, only in this case he appropriates the elements to Satan. Since Andrewes oversaw the translation of the King James Version, Milton was familiar with his sermons. The sinuous and ever-changing motion of an aurora in the sky can be likened to an ensign (military sign or banner) streaming (waving) with the wind. An aurora can also appear as a range of colours, including golden, “shining” in the sky and quite often with a sparkling

58. Christopher Hill, *Intellectual Origins of the English Revolution—Revisited* (Oxford: Oxford University Press, 1997, reprinted 2002), 23.

59. Fulke, *A Goodly Gallerye*, 30.

60. Malabika Sarkar, *Cosmos and Character in Paradise Lost* (New York: Palgrave Macmillan, 2012), 118; Andrei Dorian Gheorghe and Alastair McBeath, “Meteor Beliefs Project: Meteoric Images from the Works of John Milton,” *Journal of the International Meteor Organization* 34 (2006): 30–32.

61. Alastair Fowler, *Milton: Paradise Lost* (New York: Routledge, 2013).

62. Lancelot Andrewes, “And God called the light, Day, and the darknesse he called, Night,” in *Aposmasmata sacra: or a collection of posthumous and orphan Lectures: Delivered at St. Paul’s and St. Giles his Church* (London: R. Hodgkinsonne, 1657), 34.

effect like gems; when writers describe actual comets, they do not refer to them as “golden comets.” The allusion is intensified a few lines later at 1.547, when Milton writes of “A forest huge of spears” rising into the air.

Milton uses the imagery of flags (gonfalons) streaming in the air at 5.588–90: “Ten thousand thousand Ensignes high advanc’d, / Standards and Gonfalons twixt Van and Reare / Streame in the Aire.” The phrase “thousand thousand” is analogous to “innumerable” in describing the number of spears seen in the sky, and again the word “streame” is used. This is yet another example of how Milton makes words resonate with each other to reveal hidden connections.⁶³ After mentioning “the rassemblement of heavenly angels with their gonfalons and banners prior to God’s inaugural speech,” Neil Forsyth makes the point that *Paradise Lost* “contains many references coded or explicit to contemporary events and controversies.”⁶⁴ This observation is easily extended to include coded references to natural phenomena such as comets and the aurora.

As further evidence that this imagery was used in early modern poetry, witness this 1729 example from Richard Savage (1697–1743): “In Fancy’s eye encountering armies glare, / And sanguine ensigns wave unfurl’d in air!”⁶⁵ To leave no doubt, these lines were specifically attributed as an allusion to the aurora by the eighteenth-century scholar Richard Lobb.⁶⁶

(3) The third allusion deals with spectral battles. We have seen from book 6 that Milton combines an army marching in the sky in “battailous aspect” with innumerable “rigid spears.” This imagery also appears in another much-studied passage from *Paradise Lost* (2.533–38):

As when to warn proud Cities war appears
Wag’d in the troubl’d Skie, and Armies rush
To Battel in the Clouds, before each Van
Prick forth the Aerie Knights, and couch thir Spears
Till thickest Legions close; with feats of Arms
From either end of Heav’n the welkin burns.

63. Eagle, 192.

64. Forsyth, 63.

65. Richard Savage, “The Wanderer: A Vision in Five Cantos,” in *Various Poems* (London: J. Turner, 1761), 47.

66. Richard Lobb, *The Contemplative Philosopher* (London: G. G. and J. Robinson, 1800), 56.

Edge Hill, the first pitched battle of the English Civil War, was a marginal Royalist victory on 23 October 1642. It was fought about thirty-five miles north of Oxford. Linking the Edge Hill event of spectral armies battling in the sky to this passage is not new.⁶⁷ However, the aurora borealis as the inspiration for the imagery in this “airy knights” simile has been absent since the 1940s, even though a few authors earlier made the proper identification. It first appears in an analysis of Milton’s similes from 1796:

Another meteorous phaenomenon, the aurora borealis, could only have escaped the notice of the ancient poets, from its great uncommonness in their ages or countries. Virgil, indeed, alluded to it in his account of the prodigies at the death of Caesar; but an appearance so unusual as to be a prodigy, could scarcely be applied as a simile. Even Milton speaks of it as portentous, when he describes it as an object of similitude to the martial exercises of the fallen angels: [2.533–38].⁶⁸

In 2.533–38 we see Milton using the very imagery evoked by an aurora: during an aurora the “welkin” (sky) appears to burn from one end of the heavens to the other. Once again the vision of “spears” in the “troubl’d Skie” is used, the very same appearance the aurora offers a person gazing into the night sky. The identification of this passage with an actual physical event in the sky was pointed out even earlier, by Thomas Newton in 1750. In his notes on the passage “war appears waged in the troubled sky,” Newton quotes Shakespeare, who

67. Richard John King, “On the Supernatural Beings of the Middle Ages,” in *Two Lectures Read before the Essay Society of Exeter College, Oxford* (Oxford: Printed for private distribution, 1840), 37. See also Leonard, “To Warn Proud Cities.”

68. John T. Shawcross, *John Milton: The Critical Heritage, vol. 2 1732–1801* (London: Routledge, 1972, reprinted in 1995, 1999), 383. The passage was originally published in “Similes of Homer, Virgil, and Milton: Meteors, Lightning, Thunder and Clouds” *The Monthly Magazine* 1 (1796): 380–83. The article was signed J.A., but printed later by John Aikin, *Essays Literary and Miscellaneous* (London: J. Johnson, 1811), 25. The passage in book 2 was subsequently linked with the aurora by several authors in the nineteenth century. See J. Edmonston, *Milton’s Paradise Lost and Paradise Regained* (London: T. Nelson & Sons, 1854), 60; Thomas Keightley, *The Poems of John Milton*, vol. 1 (London: Chapman and Hall, 1859), 273; Henry Hudson, *The Complete Works of William Shakespeare*, vol. 11 (Boston: Ginn and Heath, 1880), 8. For McKillop’s notice of this passage as an auroral allusion, see his *Background of Thomson’s Seasons*, 64. These instances of 2.533–38 being recognized as auroral came to my notice during research for this paper, after Dr. Leonard and I had concluded the same.

calls these appearances “the meteors of a *troubled* Heaven.”⁶⁹ With the lens of hindsight afforded by the research presented in this paper, it becomes clear that “meteor” in the context of the passage in book 2 actually refers to an appearance of the aurora. Shakespeare himself may have had a range of potential candidates in mind, such as comets or lightning (Dr. Johnson defines “meteor” simply as “any bodies in the air or sky that are of a flux and transitory nature”). But that misses the point of this investigation: it is intriguing and prescient that Newton attributes the passage in *Paradise Lost* to a physical phenomenon rather than to a mere allusion to Josephus’s biblical account of armies appearing in the sky before the fall of Jerusalem. Leonard advances the thought on this passage to include a contemporary aspect: Milton’s plural “cities” includes both Josephus’s Jerusalem and London in the 1660s—as the Protectorate was coming to an end and the restoration of the monarchy was imminent. Despite centuries of scholarly analysis of this famous passage, this research shows that while Milton was not personally swayed by the superstitious aspects, he readily used the popular interpretation of such natural phenomena as the aurora as a divine or supernatural warning (“to warn proud cities”).⁷⁰

When Milton writes “Armies rush to Battel” you can almost hear the event. Aside from its visual appearance, an aurora is sometimes accompanied by noise. The inhabitants of Siberia have a phrase to describe this particular noise, which translated means, “The raging host is passing.”⁷¹ It is this very effect Milton portrays in his description of knights and Satan’s host in the sky. Was Milton aware that the aurora could generate sound, which, combined with the appearance of a burning sky and spears, might be interpreted as a celestial battle? Yes, for Seneca writes that the aurora “sends out a hissing flame”⁷²—both a visual and an auditory description that would not be out of place in describing Satan’s abode. Eileen Reeves has documented the canonical interpretation by early modern viewers of the aurora as the clash of armies. This suggests that almost the entire content of the passages cited here from *Paradise Lost* was a

69. Thomas Newton, *Paradise Lost: A Poem, in Twelve Books. The Author John Milton*, vol. 1 (London: J. and R. Tonson, 1750), 129. Here Newton quotes from act 1 of Shakespeare’s *Henry IV*.

70. Leonard, “To Warn Proud Cities”, 69.

71. Joseph Lovering, “On the Aurora Borealis and the Aurora Australis,” in *The American Almanac and Repository of Useful Knowledge* (Boston: Crosby, Nichols and Co., 1860), 55–76.

72. John Clarke, *Physical Science in the Time of Nero* (London: Macmillan, 1910), 37. Clarke is here quoting Seneca, *Quaestiones Naturales*, 1.1.14.

meteorological event commonplace in the early modern period, confirming the correctness of the identification offered but supplying an additional line of argument for it.⁷³

The comet in book 2 of *Paradise Lost*

The aurora was not the only physical phenomenon in the sky employed by Milton in *Paradise Lost*: in book 2 (707–11) he invoked a comet to describe Satan's appearance. The passage also linked fire (even the word "incensed," meaning "fired," is etymological wit, as "fires" two lines later confirms)⁷⁴ with the northern sky and war, just as the allusion to the aurora did in book 6:

Incensed with indignation Satan stood
 Unterrified, and like a Comet burned,
 That fires the length of Ophiuchus[,] huge
 In the Arctic Sky, and from his horrid hair
 Shakes pestilence and war. (6.79–83)

The passage has been misinterpreted by scholars for a long time. Both Newton and Todd (who quotes Newton) accept that the comet actually appeared in the constellation Ophiuchus "in the Arctic sky." Crucial questions arise here. Is that constellation, as Newton and others believed, "in the Arctic sky?" Did the comet actually appear in Ophiuchus, as most Milton scholars accept? Can Milton's comet be linked to a comet that actually appeared in the sky?

Ophiuchus is a far-reaching constellation that actually straddles the celestial equator, but most of it is south of the celestial equator. Thus it is not regarded as an Arctic (far northern) constellation. This did not prevent the famed Milton scholar David Masson from glossing over the fact that most of it is in the south. He describes Ophiuchus as "a large constellation in the northern heavens, stretching forty degrees."⁷⁵ Other scholars suggest that either Milton's knowledge of the constellations was not very precise, on account of his placing

73. Eileen Reeves, *Painting the Heavens* (Princeton: Princeton University Press, 1997), 64–68.

74. Fowler, 145.

75. David Masson, *The Poetical Works of John Milton*, vol. 3 (London: Macmillan, 1893), 343. Masson was just reiterating the commentary of Richardson (*Explanatory Notes*, 76): "Aratus has very particularly described this constellation, as standing with his foot on the back of the Scorpion, and his head extending

Ophiuchus in the Arctic sky,⁷⁶ or he manipulated details to strengthen the relationship between Satan, the comet, and the serpent-bearer constellation.⁷⁷ Regarding the former suggestion, the idea that a scholar of Milton's erudition could make a mistake of such magnitude is most unlikely. Even the otherwise astute Thomas Orchard falters here when he says Milton "appears to have been unfamiliar" with the position of Ophiuchus.⁷⁸ The latter suggestion can also be dismissed, as the author's premise was the now-discredited notion that *Paradise Lost* was a monument to scientific backwardness. Even more contrived seems the suggestion that the expression "arctic sky" refers to the position not of the comet but of the writer, meaning "as seen under the arctic or northern sky."⁷⁹

On the question of linking Milton's comet to a real one, scholars first posited the comet of 1664 as the one Milton referenced. Edward Gibbon first suggests this,⁸⁰ and by the early twentieth century it was widely accepted that the 1664 comet was the one Milton alluded to, even though Masson thought that the first six books of *Paradise Lost* were written before the appearance of this comet.⁸¹ Orchard posits the comets of CE 178 and 891 as candidates, since they did travel through Ophiuchus, but Arthur Wilson Verity identifies it as the Great Comet of 1618.⁸² Linking this comet to *Paradise Lost* is intriguing, as it may have been seen by the ten-year-old Milton. Orchard even suggests "the apparition of this imposing object must have made a deep and lasting

to that of Hercules, a length of near 40 degrees; which description is also agreeable to Ptolemy and the other ancient astronomers."

76. W. T. Lynn, "Comet Referred to by Milton," *Notes and Queries*, 7th series, vol. 2 (24 July 1886): 66. It is in this article that Lynn notes Edward Gibbon as erroneously identifying Milton's comet with the comet of 1664.

77. Svendsen, 92.

78. Thomas N. Orchard, *Milton's Astronomy: The Astronomy of Milton's Paradise Lost* (London: Longman's Green & Co., 1913), 259.

79. W. T. Lynn, "The Comet of 1664," *The Observatory* 31.401 (1908), 389–90. In this article, Lynn erroneously stated the comet of 1618 passed through Ophiuchus.

80. Edward Gibbon, *Decline and Fall of the Roman Empire*, vol. 4 (London: A. Strahan, 1788), 325.

81. Gibbon, 325.

82. For Orchard, see his *Milton's Astronomy*, 259. See also Arthur Wilson Verity, ed., *Paradise Lost* (Cambridge: Cambridge University Press, 1893), xv.

impression upon his mind.”⁸³ Noting that “Milton had a keen interest in astronomy,” Sarkar traces the sources of Milton’s knowledge of this comet to a treatise by the English astronomer John Bainbridge (1582–1643), and to popular encyclopedias such as Swan’s *Speculum Mundi*.⁸⁴ Sarkar correctly states that Bainbridge⁸⁵ explains the position of the comet with the help of a planisphere, or sky-chart (Figure 2), “which shows it stretching from the equinoctial line to the north, the cometary line running parallel to Ophiuchus.”⁸⁶ But she goes too far in trying to support her thesis linking Satan and the serpent-bearer constellation Ophiuchus by repeatedly stating the comet of 1618 actually was in that constellation: “Bainbridge locates the 1618 comet in Ophiuchus. [...] Within the context of seventeenth-century millennialism, the appearance of Satan as the comet and the new star in Ophiuchus enhances our perception of him as powerful and compelling.”⁸⁷ While it is true that the supernova (“new star”) of 1604 was in Ophiuchus, it is not true that the comet of 1618 (in modern terminology, 1618 W1) was there too. Bainbridge never says the comet of 1618 was in that constellation; his book shows the comet running through Libra, Virgo, Bootes and Ursa Major, adjacent to, but not in, Ophiuchus. Modern computer calculations agree with Bainbridge that it never passed through Ophiuchus. Eyewitnesses said the comet’s tail was so long it extended into the northern reaches of the sky. Extensive tail lengths, up to 104 degrees in the sky, were reported for 1618 W1.⁸⁸ In addition, the comet headed northwards, until

83. Orchard, 257.

84. Malabika Sarkar, “Astronomical Signs in *Paradise Lost*: Milton, Ophiuchus, and the Millennial Debate,” in *Milton and the Ends of Time*, ed. J. Cummins (Cambridge: Cambridge University Press, 2003), 82–95. See also Swan, *Speculum Mundi*.

85. John Bainbridge, *An Astronomical Description of the late Comet from the 18. of Novemb. 1618 to the 16. of December following* (London: Edward Griffin, 1619).

86. Sarkar, “Astronomical Signs,” 90.

87. Sarkar, “Astronomical Signs,” 92.

88. David Seargent, *The Greatest Comets in History* (New York: Springer, 2009), 111. In a private communication, Seargent wrote that the comet “does not appear to have been within the boundaries of Ophiuchus at any time but, looking at the path on a star chart, it did indeed move northward on a ‘line running parallel to Ophiuchus,’ just as Sarkar wrote.” The fact that the comet was not in Ophiuchus is reinforced by the conclusion of William Hunter, *The Descent of Urania: Studies in Milton, 1946–1988* (London: Associated University Presses, 1989). See the chapter “Satan as Comet: *Paradise Lost* 2.708–711.”

it reached an area near the Pole star, where it finally disappeared.⁸⁹ Milton says that the comet extended across a length of sky beside Ophiuchus, but not in that constellation. Crucially, he is saying that the comet, not Ophiuchus, was huge in the Arctic sky: “huge” modifies comet, not Ophiuchus, which justifies my intrusion of a comma between “Ophiuchus” and “huge” in 2.709. Thus, the tortured problem of trying to reconcile the comet of 1618 in a constellation that does not appear in the Arctic vanishes, solving a conundrum that has bedeviled Milton scholars since at least 1750. As usual in his astronomical allusions, Milton was precise. Confusion occurred only in the minds of those who under-analyzed what he wrote.⁹⁰

Milton's use of a comet shows that he evoked fire, war, and the northern sky as emotive and celestial-geographical terms when describing both the aurora (meteor) and a comet. However, the imagery in 2.707–11 should be considered analogous to, but not identical with, that used by Milton in his description of the aurora, which was clearly delineated quite differently. This analysis also shows that Milton had a full command of astronomical knowledge and sky lore which he used as needed to advance the story of *Paradise Lost*. The careful deployment of shooting stars, meteors, and comets as distinct entities emanated from the mind of Milton. The conflation of these entities, and the confusion caused by their misinterpretation, is due entirely to other writers. In this context, we find the deliberate conflation of comets and meteors in a unique reinterpretation by Dr. Johnson. Both comets and the aurora evoked wonder and terror for centuries. But here the passage in book 2 is transformed by “enquiry” into terms (vapours/exhalations and flame) shown in this article

89. Tabitha van Nouhuys, *The Ages of Two-Faced Janus: The Comets of 1577 and 1618* (Leiden: Brill, 1998), 255. For the contemporary relevance of the comet of 1618 in England, see James Doelman, “The Comet of 1618 and the British Royal Family,” *Notes and Queries* 54 (2007): 30–35.

90. In a personal communication in May 2015, Leonard offered this commentary on my solution to the long-standing conundrum posed by the comet passage: “Now that I can hear the lines correctly (with that putative comma) it all makes sense. Until now I heard ‘Ophiuchus huge in the Arctic sky.’ Now I hear ‘fires the length of Ophiuchus, huge in the Arctic sky’ (meaning that a huge comet fires the length of Ophiuchus, and then keeps going into the Arctic).” In his *Phaenomena*, Aratus (a known source for Milton), did not refer to the great size of the constellation Ophiuchus, another indication Milton never meant “huge” to modify “Ophiuchus.”

to relate to the aurora. In the hands of Dr. Johnson, Milton's epic simile becomes a devastating mock-heroic metaphor:⁹¹

Junius is an unusual phaenomenon on which some have gazed with wonder and some with terrour, but wonder and terrour are transitory passions. He will soon be more closely viewed or more attentively examined, and what folly has taken for a comet from that its flaming hair shook pestilence and war, enquiry will find to be only a meteor formed by the vapours of putrefying democracy, and kindled into flame by the effervescence of interest struggling with conviction; which having plunged its followers in a bog, will leave us enquiring why we regarded it.⁹²

Here Johnson refers to Junius, which was the pseudonym of a writer who contributed a series of letters to the *Public Advertiser* from 1769 to 1772. Many of them focused on blatant corruption by the government—a “putrefying democracy” in Johnson's passage. Johnson's transmogrification of *Paradise Lost*, by effectively offering us the flip side of the “comet/meteor” coin, also serves to show how scholars were misled into seeing only (comet) tails, when in fact Milton writes about (meteor) heads.

Edmund Halley and the visibility of the aurora in England

While the aurora borealis is well-known today and has been witnessed by countless people, it was not always so. This fact is made clear in an account by the astronomer Edmund Halley, who saw an aurora on 6 March 1716:

This was the only [meteor] I had not as yet seen, and of which I began to despair; since it is certain that it hath not happen'd to any remarkable degree in this part of England since I was born [1656]: nor is the like recorded in the *English Annals* since the Year of our Lord 1574, that is above One Hundred and Forty Years ago, in the Reign of Queen *Elizabeth*. Then, as we are told by the Historians of those times, *Cambden* and *Stow*, Eye-Witnesses of sufficient credit, for two Nights successively, viz.

91. Christine Rees, *Johnson's Milton* (Cambridge: Cambridge University Press, 2010), 91.

92. Samuel Johnson, *Thoughts on the Late Transactions Respecting Falkland Islands* (London: Cadell, 1771).

on the 14th and 15th of *November* that Year, much the same wonderful Phenomena were seen, with almost all the same Circumstances as now.⁹³

The widespread belief perpetuated by Halley—that the aurora was scarcely noted in the entire seventeenth century—has been called into question. Joseph Lovering, in his lengthy and magisterial work on the aurora, lists scores of examples from Continental observers in the late sixteenth and early seventeenth centuries.⁹⁴ And John Eddy “suspects that the dramatic jump in the number of reported aurorae after 1716 was a direct result of this important paper by Halley, which put the auroral phenomenon on a firm scientific footing so that more aurorae were looked for and more regular records were kept.”⁹⁵ The report of 12 September 1621 by Gassendi (which he first published in 1641) was the only major auroral appearance recorded in Europe in Milton’s youth—but was it seen in England? Halley, from his perspective in 1716, was not aware of any report of a prominent aurora between 1574 and 1716. Whiston, however, recording an extensive account of the same 1716 aurora seen by Halley, includes this note after his translation of Gassendi’s report of the major 1621 auroral appearance in France: “This Surprising METEOR was seen also in England, as Camden himself intimates at the Year 1621, after his *Letters*.”⁹⁶ Whiston is referring to Camden’s diary, which contains this entry for September 1621: “Chasma in coelo visum” (There was a meteor visible in the sky). As Whiston says, this passage comes “after his Letters.” To be precise, it comes from the diary of Camden, included in a book of Camden’s work, but after his *Epistolae*.⁹⁷

Modern scholars of Camden have interpreted *chasma* to mean “big hole” in the sense of some strange-looking cloud formation. (In Milton’s time,

93. Edmund Halley, “An Account of Several Extraordinary Meteors or Lights in the Sky,” *Philosophical Transactions* 6 (1716): 406–28.

94. Joseph Lovering, “On the Periodicity of the Aurora Borealis,” *Memoirs of the American Academy of Arts and Sciences* 10, part 1 (1868): 9–351.

95. John Eddy, “The ‘Maunder Minimum,’” in *The General Crisis of the Seventeenth Century*, ed. Geoffrey Parker and Lesley Smith (London: Routledge, 1997), 266–300.

96. Whiston, 14.

97. Thomas Smith, *Epistolae Gulielmi Camdeni et illustrium virorum ad G. Camdenum epistolae* (London: Richard Chiswell, 1691). The second part of the book, containing Camden’s diary, has its own title: *Gulielmi Camdeni annales ab anno 1603, ad annum 1623*. The crucial quote appears on page 74; the translation is mine.

Thomas Browne poetically combined *chasma*, a cloud rising “to her Element of fire,” and an exhalation “from my heart”⁹⁸). But they were misled into thinking he refers to a weather event by the fact that Camden often noted the day’s weather in his diary, and by his pronounced superstitious streak which often focused on such oddities.⁹⁹ This interpretation, however, is incorrect. Here, he uses the word *chasma* as “a kind of meteor.” This occurs in the ancient texts by Pliny and Seneca, both of which Milton read. In his *Natural History*, Pliny writes: “The *trabes* also, which are named *δοκοί*, shine in the same manner; one of these was seen at the time when the Lacedæmonians, by being conquered at sea, lost their influence in Greece. An opening sometimes takes place in the firmament, which is named *chasma*.”¹⁰⁰ The Spartan naval defeat Pliny mentions is a reference to the Battle of Cnidus in 394 BCE. Seneca writes this as part of a description of what he termed “celestial fires”:

There are Chasmata, too, when there is a subsidence of some portion of the heavens, which sends out hissing flame, as it were, from its hidden recesses. There are also a great number of colours in all these. Some are of brightest red, some of light insubstantial flame, some of white light, some glittering, some with a uniform glow or orange without sparks or rays.¹⁰¹

The passage by Camden in his diary also suggests that Halley was wrong in his assertion that no aurora was seen from England in the early seventeenth century. Since Halley was aware of Gassendi’s report of the 1621 event, he would surely have mentioned that the same aurora was visible from England if he had also read Camden’s diary. Instead, he specifically says the aurora of 1621 “is nowhere said to have been observed in England, over which the light seemed to lie” from Paris and Rouen.¹⁰² Camden’s diary entry shows this to be false. Halley also failed to take note of the aurora of March 1661, described by J. Jones as

98. Gillian Wright, *A Commentary on and edition of the shorter poems of William Browne of Tavistock in British Library MS Lansdowne 777* (Glasgow: University of Glasgow, 1998), 226. See Browne’s 1624 poem “A Sigh from Oxford,” lines 115–123.

99. This insight comes from a private communication in April 2014 with noted Camden scholar Dana F. Sutton.

100. Pliny, *Natural History*, 2.96: see the chapter entitled “Trabes Celestis; Chasma Coeli.”

101. Quoted in Clarke, *Physical Science in the Time of Nero*, 38.

102. Halley, 418.

being seen by “diverse persons of credit standing on London Bridge between 7 and 8 of the clock at night. Two great Armies marching forth of two clouds, and encountering each other.”¹⁰³ It is entirely possible that Milton was told of this as he was writing *Paradise Lost*, feeding directly into his imagining a celestial battle of two great armies. Thus, the assertion by Halley that no prominent aurorae were seen in England from 1574 to 1716, which has been repeated in many subsequent texts, cannot be sustained. Since the 1621 aurora was seen in England, it is possible the thirteen-year-old Milton saw it.

Conclusions

This paper has addressed four significant points of historical scholarship. First, an exegesis of *Paradise Lost* reveals that John Milton refers to the aurora borealis in book 6 (79–83) and book 2 (533–38), with highly suggestive references in book 1 (537–38) and book 12 (629). Only by understanding that Milton saw, or expected his readers to see, the aurora as meteorological will historians understand Milton more clearly. Once scholars of that great epic take this into account in their future analysis, further understanding of what Milton meant and what sources he drew upon to create *Paradise Lost* will follow. The biblical interpretation made by scholars of *Paradise Lost* is not surprising since, as Debora Shuger notes about Renaissance England, “Religion during this period supplies the primary language of analysis. It is the cultural matrix for explorations of virtually every topic.”¹⁰⁴ However, interpreting virtually every topic retrospectively in the same language of analysis misses other important ways people of that time expressed themselves. To give but one example of how a filter affects the results: Christian Cann, in an extensive survey of allusions of mythological origin in *Paradise Lost*, makes no mention of 6.79–83.¹⁰⁵ This is not surprising, since the passage has no obvious mythological origins. Likewise, a filter that is set to search for religious allusions will miss those whose origin comes from a description of natural phenomena/science. The “religious filter” found

103. Derek Justin Schove, “London Aurora of A.D. 1661,” *Journal of the British Astronomical Association* 63 (1953): 266.

104. Debora Shuger, *Habits of Thought in the English Renaissance* (Toronto: University of Toronto Press, 1997), 6.

105. Christian Cann, *A Scriptural and Allegorical Glossary to Milton's Paradise Lost* (London: Printed for the authoress, and sold by C. and J. Rivington, 1828).

an allusion in 6.79–83, and the “linguistic filter” employed by the Richardsons found a pun, but both missed the concurrent allusion to the aurora. The fact that a physical description of the aurora was “hiding in plain sight” for more than three hundred years is ample evidence that a new approach can lead to other important discoveries in this and other texts of the early modern period. Some movement towards this approach has begun in the twenty-first century, building on the late-nineteenth-century work by Orchard. But progress was derailed in the mid-twentieth century by Kester Svendsen’s look at Milton’s science. Karen Edwards shows how he sent a generation of Milton scholars down the wrong trail, believing *Paradise Lost* was a monument to scientific backwardness.¹⁰⁶ Orchard’s thought must be kept in mind: “Milton was deeply versed in all the astronomical controversies that were being waged in his time, the merits of which he was fully capable of appreciating.” He specifically says Milton incorporated a “varied wealth of astronomical allusion and details [...] in the pages of *Paradise Lost*.”¹⁰⁷ A few modern scholars have taken note. For example, Justin Clemens has also applied the filter of science to Milton’s work, specifically as it relates to Galileo.¹⁰⁸ On the botanical side, Edwards argues that Milton has represented the natural world in *Paradise Lost*, with its flowers and trees, insects and beasts, as a text alive with meaning and worthy of close reading. Source inspiration was suggested by the speculations of Milton’s scientific contemporaries, including Robert Boyle, Thomas Browne, and John Evelyn. The cosmological implications of *Paradise Lost* have recently been properly explained in a superb work by Dennis Danielson.¹⁰⁹

Second, the study of astronomical imagery in *Paradise Lost* must be treated with much more caution. Geneva does not distinguish between aurora and comets, and Sarkar not only conflates the meaning of meteor and shooting stars, but states that the comet of 1618 was in a constellation in which it never actually appeared. She relies on the notion that Satan figured as both a comet and a star in Ophiuchus to enhance our perception of him as powerful and compelling; yet Satan did not appear as a comet in Ophiuchus. How this affects

106. Karen L. Edwards, *Milton and the Natural World: Science and Poetry in Paradise Lost* (Cambridge: Cambridge University Press, 1999).

107. Orchard, 127.

108. Clemens, “Galileo’s Telescope,” 179–94.

109. Dennis Danielson, *Paradise Lost and the Cosmological Revolution* (Cambridge: Cambridge University Press, 2014).

the totality of her thesis about Satan in *Paradise Lost* is a matter Milton scholars will have to examine seriously. This article has presented a new way of reading Milton's use of a comet in book 2 (707–11), thus cutting the Gordian knot that has tied up the correct interpretation of this famous passage for more than 250 years.

Third, historians of astronomy need to reassess their acceptance of Halley's account of the lack of aurora in England for more than a century. Another problem with Halley scholarship as it relates to the aurora is the matter of who originated the term "aurora borealis." Halley's 1716 paper was widely noted and referenced from his own time until now. In that paper he states the 1621 event was "seen all over France, and was well described by Gassendi in his *Physics*, who gives it the name of *Aurora Borealis*."¹¹⁰ Scholars attribute this passage as the reason most subsequent writers have given Gassendi the credit for the term, although it was Galileo who used it as a metaphor in Italian thirty years earlier in his 1619 *Discourse on the Comets*. This suggests that much more caution must be used before blindly repeating what Halley either said or intimated as the essential truth of astronomical history.

Finally, Whiston, in the eighteenth century, clearly understands William Camden to mean "the aurora" in his diary of 1621, but it has not always been properly understood as such in modern Camden scholarship. Like the many Milton scholars who have studied *Paradise Lost* for centuries, scholars in other areas of seventeenth-century studies have not been looking for or expecting auroral imagery in the texts they study. Once scholars in a range of disciplines incorporate a broader and deeper understanding of exactly what meteorological phenomena meant in the early modern period, its application to the works of Milton, Camden, and others will enhance our understanding of what these great authors wrote.¹¹¹

110. Halley, 418.

111. Simeon Kahn Heninger, *A Handbook of Renaissance Meteorology: With Particular Reference to Elizabethan and Jacobean Literature* (Durham: Duke University Press, 1960), 93.

