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Ass-troll-ogical Nashe: Revisiting Two Dangerous Comets and A Wonderful Prognostication

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> Wherein, if anie cracke or flawe shall be founde, I gyve him that first finds the same, full leave and lycence to call me lyar. And if that seeme not halfe sufficient, I will be sworne to burne my Bookes, and knyt Nettes of Coventry blewe for Woodcocks.

So ends the mock-prognostication, *Fearfull and lamentable effects of Two Dangerous Comets, which shall appeare in the yeere of our Lord, 1591. the 25. of March*,[1] by one 'Simon Smellknave'.[2] Smellknave ends in mock-indignation: who would dare to suggest that his pamphlet has not been truthful in its predictions? Despite appearances, his final sentence is far from contrite. He is confident of his ability to fool his reader and, as debate has continued as to the identity of Smellknave for over four centuries, his confidence is arguably not misplaced. Smellknave has continued to trap his readers as if they were woodcocks—fools or dupes which, like the bird, are easy to catch—even using bright blue nets: the trap should be obvious and yet the writer behind the pseudonymous Smellknave has not yet been identified.

As John Florio's hyperbolic complaint about English writers who 'pronosticate of faire, of foule, and of smelling weather' and other 'triuiall, friuolous, and vaine vaine droleries' delivered 'to the presse' in 1591 suggests, prognostications and almanacs were extremely popular, as was the satirical genre that followed it.[3] Indeed, *Two Dangerous Comets* 'does not stand alone, but is one of

[1] Titles for early modern works are generally given as printed rather than edited, with places and dates of publication from A. W. Pollard and G. W. Redgrave (eds.), *A Short-Title Catalogue of Books Printed in England, Scotland, & Ireland and of English Books Printed Abroad 1475–1640* [*STC*], 3 vols, 2nd rev. edn, rev. W. A. Jackson, F. S. Ferguson and Katharine F. Pantzer (London: Bibliographical Society, 1976–91).

[2] Simon Smel-knave, *Fearfull and lamentable effects of two dangerous Comets, which shall appeare in the yeere of our Lord, 1591. the 25. of March* [*Two Dangerous Comets*] (London, 1591; *STC* 22645), sig. D2r–v.

[3] John Florio, *Second frutes* (London, 1591; *STC* 11097), sig. A2r–v. Florio extends the hyperbolic description of astrologers as 'men weatherwise' who claim to 'foretell of change and alteration' in the weather 'by aches' (A2r).

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a group' of pseudonymous mock-prognostications 'issued in apparent rivalry' that year.[4] The first of these, a pamphlet by 'Francis Fairweather', was recorded in the Stationers' Register on 25 February 1591 under the publisher William Wright but is now lost;[5] the second, *A Wonderfull, strange and miraculous Astrologicall Prognostication* by 'Adam Foulweather', like *Two Dangerous Comets*, was not entered into the Stationers' Register but copies of both texts are extant.[6] Given the connections between these titles, any persuasive arguments about their putative authorship 'must take account of the whole group'.[7] Thus, drawing on extensive contextual research as well as new findings from the computational analysis, we revisit the authorship of—and relationship between—these pamphlets, concluding that *Two Dangerous Comets* and *A Wonderful Prognostication* are both by Thomas Nashe. While *A Wonderful Prognostication* has long been associated with Nashe, the attribution of *Two Dangerous Comets* affords new perspectives onto his experimentation across genres during the early part of his literary career, the development of his satire and his engagement with Elizabethan print culture.

NASHE AND MOCK-PROGNOSTICATIONS

As a genre, the mock-prognostication was relatively new: earlier in the sixteenth century, François Rabelais authored five mock-almanacs which 'in many ways set the stage for later English versions of the trope of playing with astrological discourse and belief'.[8] Though these were not translated into English until the seventeenth century, Nashe's penchant for Rabelaisian style had been noticed by his contemporaries as Gabriel Harvey describes a young Nashe haunting '*Aretino* and *Rabelay* the two monstrous wittes of their languages'.[9] Huntingdon Brown notes that the *Wonderfull Prognostication* resembles Rabelais' *Pantegrueline Prognostication* (1532)

[4] R. B. McKerrow (ed.), *The Works of Thomas Nashe,* 5 vols (London: A.H. Bullen, 1904–5), V: 139.

[5] Edward Arber (ed.), *A Transcript of the Registers of the Company of Stationers of London; 1554–1640 A.D.*, 5 vols (London: privately printed, 1875), II: 576 (Register B, fol. 271v).

[6] Adam Fouleweather, *A Wonderfull, strange and miraculous Astrologicall Prognostication for this yeere of our Lord God. 1591* [*A Wonderful Prognostication*] (London, [1591]; *STC* 11209). Curiously, *A Wonderful Prognostication* appeared in a second edition of 1591 (STC 11210), chiefly distinguished by paragraph arrangement and some other minor variants; see F. P. Wilson, 'A Wonderfull Prognostication (1591)', *Modern Language Review,* 13.1 (1918), 84–5.

[7] McKerrow (ed.), *Works of Nashe*, V: 139.

[8] Katherine Walker, '"Daring to Pry into the Privy Chamber of Heaven": Early Modern Mock-Almanacs and the Virtues of Ignorance', *Studies in Philology*, 115.1 (2018), 129–53 (138).

[9] Harvey, *A Nevv Letter of Notable Contents* (London, 1593; *STC* 12902), sig. B3r. Pietro Aretino was a strong influence on Nashe and wrote a series of mock-prognostications (dated 1527, 1529 and 1534) under the pseudonym Pasquino. For the 1527 and 1534 mock-prognostications, see Pietro Aretino, *Operette politiche e satiriche,* II, ed. Marco Faini (Rome, 2012), 90–91, 172–98; for the 1529, see Franca Ageno, 'Un pronostico dell'Aretino in un manoscritto Hoepli', *Lettere italiane* 13 (1961), 449–51. It is not known whether Nashe ever had sight of them.

'strikingly throughout' and is the 'unacknowledged source' of Foulweather.[10] Anne Lake Prescott notes that John Wolfe entered 'Gargantua his Prophesie' into the Stationers' Register in April 1592, which may be a translation of the *Pantagrueline Prognostication* meaning that Nashe may have been familiar with it in translation.[11] Indeed, both Foulweather and Smellknave mix the obvious with plausible-sounding astrological knowledge in the manner of Rabelais: for example, Foulweather's claim that 'olde women that can liue no longer shall dye for age' strongly echoes Rabelais' suggestion that 'old Age shall this year be incurable by reason of the years past'.[12] Katherine Walker suggests that Foulweather's *A Wonderful Prognostication* is 'the first notable English version' of the mock-almanac genre,[13] a genre which continued in popularity into the seventeenth century. An early English example is *A merie and p[leasant] prognostica[tion] Deuised after the finest fashion*,[14] printed in 1577 and advertised as the work of 'fower wittie doctors'—Spendall, Whoball, Doctor Deusace and Will Sommers—though much of the material is derived from an earlier mock-prognostication published 33 years prior, *A mery p[ro]nosticacion*, which reinforces its comedic credentials on the title page by incorporating a woodcut of a fool, complete with ass's ears and tail.[15] The alliterative 'pleasant prognostication' may have inspired the title of Fairweather's pamphlet, which is listed as 'Francis Fairweather's pleasant prognostication, &c. in 4° 1591' in Francis Daniel Pastorius' commonplace book, known as the 'Bee-Hive' manuscript, begun in 1696.[16] To our knowledge, this is the only record of a title for Fairweather's pamphlet. It is likely that the writer or writers of the three mock-prognostications published in 1591 were familiar with both the new genre and its genuine counterpart—indeed, the partial title of Fairweather's pamphlet suggests a conscious engagement with other mock-prognostications.

[10] Huntingdon Brown, *Rabelais in English Literature* (Cambridge, MA: University of Harvard Press, 1933), 37, 41.

[11] Anne Lake Prescott, *Imagining Rabelais in Renaissance England* (New Haven: Yale University Press, 1998), 196.

[12] Foulweather, *Wonderfull*, sig. A4v; François Rabelais, *Pantagruel's Prognostication* […] *Now of Late Translated Out of French by Democritus Pseudomantis* (London, 1660; Wing R106), sig. B5r.

[13] Walker, '"Daring to Pry"', 141

[14] *A merie and p[leasant] prognostica[tion] Deuised after the finest fashion* (London, [1577]; *STC* 24920.5), reprinted 46 years later (London, 1623; *STC* 24921). The text is signed 'I. D.' and was entered into the Stationers' Register as by 'J. Dernyll'; see Arber (ed.), *Transcript*, I: 337 (Register A, fol. 153r).

[15] A *mery p[ro]nosticacion for the yere of Chrystes incarnacyon a thousande fyve hundreth fortye [and] foure* ([London], [1544]; *STC* 394.5).

[16] Francis Daniel Pastorius, 'His Hive, Melliotrophium Alvear or, Rusca Apium, Begun Anno Do[mi]ni or, in the year of Christian Account 1696' (MS. Codex 726, Kislak Center for Special Collections, University of Pennsylvania Libraries), I: 62.2. Facsimile images are available from the *Digital Beehive*, Kislak Center for Special Collections, University of Pennsylvania Libraries, 2017–, https://kislakcenter.github.io/digital-beehive/.

Almanacs were extremely popular and 'were bought, read and used by men and women across the social spectrum'.[17] Cheap and annually produced, once their original purpose had been served almanacs would be used 'for lining pie dishes, for lighting tobacco, as toilet paper' and so relatively few survive.[18] Perhaps this ephemerality was attractive to writers of mock-prognostications, that even the genuine article was not expected to last afforded satirists some measure of protection. Writers of mock-prognostications tend to use pseudonyms that not only signal the genre, such as Fairweather or Will Sommer, but the practice is also in line with genuine almanacs and prognostications, such as the prognostications of Erra Pater (also known as the Prognostications of Esdras). Little is known about Erra Pater but his anonymity provides the prognostications, which were reprinted at least 12 times between 1536 and 1639,[19] with authority as he is described on the title page as 'a Jewe borne in Jewery, a Doctour in Astronomye, and Physycke'.[20] In *A Wonderful Prognostication*, Foulweather adopts a similar method of establishing authority by describing himself as 'student in astronomy' or, in the unique British Library copy (*STC* 11209), the more jovial 'student in Asse-tronomy'. In this, Foulweather follows other genuine almanac writers such as Gabriel Frend, who describes himself as 'student in Astronomie' in his almanac and prognostication of 1592.[21] Nashe has a particular issue with Frend because he believed him to be 'no *Frend*, but my constant approued mortall enemie *Gabriell Haruey*'.[22]

The form itself offers opportunities for creativity and to target specific groups. Both Foulweather and Smellknave take issue with various professions, such as tailors who 'shall steale nothing but what is brought unto them'[23] and who 'shall haue more conscience, for where they were wont to steale but one quarter of a cloak, they shall haue due Commission to nick their customers in the Lace, and take more then enough for the newe fashion sake, beside theyr old fees' and, in taking aim at tailors, they also criticise frivolous fashion and those who pursue it.[24] Nashe reproduces the form of a mock prognostication so perfectly that, at times, it would be difficult to tell the difference between his text and a real prognostication. For example, Frend lists so many potential diseases as a product of winter,

[17] Adam Smyth, 'Almanacs and Ideas of Popularity', in Andy Kesson and Emma Smith (eds.), *The Elizabethan Top Ten: Defining Print Popularity in Early Modern England* (Farnham: Ashgate, 2013), 125–33 (128).

[18] Adam Smyth, 'Almanacs, Annotators, and Life-Writing in Early Modern England', *Studies in English Manuscripts*, 38:2 (2008), 200–244 (203).

[19] Louis B. Wright, 'Handbook Learning of the Renaissance Middle Class', *Studies in Philology*, 28 (1931), 58–86 (82).

[20] Erra Pater, *The pronostycacyon for euer of Erra Pater: A Jewe borne in Jewery, a Doctour in Astronomye, and Physycke* ([London], [1540?]; *STC* 10515).

[21] Gabriel Frende, *A briefe Prognostication, seruing for the yeere of our Lord M.D.XCII* (London, [1592]; *STC* 444.9), titlepage.

[22] Thomas Nashe, *Have with you to Saffron walden* (London, 1596; *STC* 18369), sig. L2v.

[23] *A Wonderful Prognostication*, sig. C4v.

[24] *Two Dangerous Comets*, sig. B2r.

including 'Rewmes, Catarres, Coughes […] joynt Aches, goutes and such lyke',[25] that it is almost a guarantee that the reader should be afflicted with one of them. In derision of the form, Smellknave couches similarly obvious predictions in profound terms: 'it shall be wonderfull to behold, (through this sinister influence) howe men that are deafe, shall heare no more than those that are dead: and such as are without teeth, shal chewe as little as babes newe borne',[26] whereas Foulweather claims that 'manye shall goe soberer into Tauernes then they shall come out'.[27]

Visually, mock-prognostications employ many of the aesthetics of genuine almanacs: they were the same size, sold cheaply and some employed other generic signals on the title page such as horoscopes. Adam Smyth notes that 'mock almanacs are very close to the originals: there is a curious alignment of parody and original; a sense, even, of satire lagging behind its object',[28] and so unsuspecting readers could, and evidently did, mistake mock-prognostications for the genuine article. Thus, Pastorius might be forgiven for listing Fairweather's pamphlet along with other titles of 'Books treating of Magical Arts better to be burnt than sold'.[29]

It is easy to see why the mock-prognostication genre would have appealed to Nashe. It gave him licence to continue developing his satire under a pseudonym, something he was used to as one of the writers employed by the archbishops to write the anti-Martinist pamphlets. Indeed, Simon Smellknave recalls his previous alter-ego, 'Cutbert Curry-knave', who appeared the year before in *An Almond for a Parrot*.[30] In 1589, under the pseudonym 'Pasquill of England', Nashe promised Martin Marprelate—and his readers—an almanac:

> *Pasquill* hath vndertaken to write a very famous worke, Entituled, *THE OWLES ALMANACKE:* wherein the night labours and byrth of your Religion is sette downe: the ascent and descent of the Starres that fauour it, is truelie calculated: the aspects of the Planets raigning ouer it, are expressed, with a iollie coniecture drawne from the iudgement of the Theame, what end your Religion is like to haue.[31]

Though *The Owl's Almanac* did not appear as part of the anti-Martinist programme, Nashe clearly signals a future intention to engage with the genre at this early stage. A publication of the same title appeared in 1618 (anonymously, once attributed to Thomas Dekker but now thought to be by Thomas

[25] Frende, *A briefe Prognostication*, sig. C2v.
[26] *Two Dangerous Comets*, sigs. B2v–B3r.
[27] *A Wonderful Prognostication*, sig. B1v.
[28] Smyth, 'Almanacs and Ideas of Popularity', 132.
[29] Pastorius, 'His Hive', I: 62.2.
[30] Cutbert Curry-knave [Thomas Nashe], *An almond for a parrat* (London, 1590; *STC* 534), titlepage.
[31] Pasquill of England [Thomas Nashe], *A Countercuffe giuen to Martin Iunior* ([London], 1589; *STC* 19456.5), sig. A2v. The identification of Pasquill with Nashe is itself a matter of debate.

Middleton) and the title's reference to the promised publication of 30 years previous is clear.[32] Although ephemeral, mock-prognostications are far from inconsequential pieces of literature: they are self-referential, which helps to ensure their longevity and prolong discussion about the very things they satirise long after they have lined pie dishes alongside their genuine counterparts. As a young satirist emerging from the Marprelate controversy, with a literary nemesis to target, and with the genre favoured by Rabelais and Aretino, how could the anonymity, ephemerality and self-reflexivity of mock-prognostications not have appealed to Nashe?

PREVIOUS ATTRIBUTIONS, 1778–2023

R. B. McKerrow included *A Wonderful Prognostication* in *The Works of Thomas Nashe*, which remains the standard edition, 'as it seems to be commonly regarded as a genuine work of Nashe', though he was doubtful of the attribution: 'I have been unable to discover any reason whatever for so considering it, nor have I been able to learn by whom or on what grounds it was first attributed to him'.[33] Printing the pamphlet among Nashe's 'Doubtful Works', the earliest association McKerrow could locate comes from the 1807 auction catalogue of Isaac Reed's library, in which *A Wonderful Prognostication* is listed alongside other putative Nashe titles.[34] The catalogue evidence, however, cannot be taken at face value, given that the same also ascribes several works penned by Gabriel Harvey and others to Nashe.[35] The same list of supposed Nashe texts was reported in volume VII of Samuel Egerton Brydges' *Censura Literaria* (1808), which also records the purchase of Reed's copy of *A Wonderful Prognostication* at that sale by Edmond Malone.[36] An earlier reference that apparently escaped McKerrow's attention comes from George Steevens, who in 1778 cited *A Wonderful Prognostication* as 'by Nash' in his commentary on Shakespeare's *Richard*

[32] *The owles almanacke* (London, 1618; *STC* 6515); Neil Rhodes (ed.), *The Owl's Almanac*, in Gary Taylor and John Lavagnino (gen. eds.), *Thomas Middleton and Early Modern Textual Culture* (Oxford: Oxford University Press, 2007), 400–2, 641–2.

[33] McKerrow (ed.), *Works of Nashe*, V: 138.

[34] *Bibliotheca Reediana: A catalogue of the […] library of the late Isaac Reed […] sold by auction by Messrs. King and Lochée* (London, 1807), 104 (item 2443).

[35] Items 2444–7, which include Harvey's *Foure letters* (London, 1592; *STC* 12900.5), *Pierces supererogation* (London, 1593; *STC* 12903) and *New letter of notable contents* (London, 1593; *STC* 12902), as well as *Returne of the knight of the poste from Hell* (London, 1606; *STC* 20905) – the promised sequel to *Pierce Penniless* which Nashe did not write. For similar reasons, McKerrow dismisses two further attempts to list Nashe's works in the nineteenth century as unsound (V: 136–7).

[36] Samuel Egerton Brydges, *Censura Literaria* 7 (1808), 10.

III.[37] Unfortunately, Steevens (or, at least, Malone's reportage of Steevens) offers no further detail to support this ascription.

When J. Payne Collier edited *Pierce Penniless* for the Shakespeare Society in 1842, he credited *A Wonderful Prognostication* to Nashe as well.[38] 'Since Collier's time', McKerrow concludes, 'the attribution seems to have been accepted without question',[39] including the Rev. Alexander B. Grosart, who incorporated *A Wonderful Prognostication* into his six-volume edition of Nashe's works for the Huth Library, published for private circulation, 1883–1885. Whereas Collier characterised *A Wonderful Prognostication* as a retort by Nashe against a personal attack by Gabriel Harvey,[40] Grosart situated the pamphlet among the 'Harvey–Greene Tractates' as an example of 'Nashe [coming] to the rescue of the dishonoured memory of his deceased friend'.[41] To round out the century, George Saintsbury anthologised *A Wonderful Prognostication* in his *Elizabethan & Jacobean Pamphlets* of 1892, ascribing it to Nashe as 'composed in direct imitation of Rabelais' and only 'indirectly an attack on the Harveys'.[42]

Though the precise origins of Nashe's association with *A Wonderful Prognostication* remain a mystery, the validity of the attribution has not gone uncontested. In his 1907 Leipzig University doctoral dissertation on Nashe's polemics, for example, Arno Piehler doubted the attribution for several reasons, including authorial style:

> The diction is not Nashe's in his other prose writings; everything characteristic of his language is missing. The personal, which is always in the foreground with him, recedes here completely. After such a severe challenge as Nashe had received from the Harvey brothers, he would certainly have strayed from his subject several times and made insults to his offenders. The fine irony without any personal barbs completely contradicts his biting mockery, which, mixed with strong insults, never leaves anyone in doubt who he is hitting.[43]

[37] Samuel Johnson and George Steevens (eds.), *The plays of William Shakspeare in ten volumes*, 2nd edn (London, 1778), VII: 124. Edmond Malone also reports Steevens citing *A Wonderful Prognostication* as 'by Nashe, in ridicule of Richard Harvey' in his commentary on *Much Ado About Nothing*; see Edmond Malone (ed.), *Supplement to the Edition of Shakespeare's Plays*, 2 vols (London, 1780), I: 108.

[38] J. Payne Collier (ed.), *Pierce Penniless* (London: Shakespeare Society, 1842), xii; McKerrow (ed.), *Works of Nashe*, V: 138.

[39] McKerrow (ed.), *Works of Nashe*, V: 138.

[40] Collier (ed.), *Pierce Penniless*, xii. Collier's narrative is echoed by Barbara Hodgdon in her entry on 'Nashe, Thomas (1567–1601')', in Arthur F. Kinney and David W. Swain (eds.), *Tudor England: An Encyclopedia* (New York: Garland, 2001), 510.

[41] Alexander B. Grosart (ed.), *The Complete Works of Thomas Nashe*, 6 vols ([London]: privately printed, 1883–5), I: liv.

[42] George Saintsbury (ed.), *Elizabethan & Jacobean Pamphlets* (London: Percival and Co., 1892), 164.

[43] Arno Piehler, *Thomas Nash und seine Streitschriften* (Leipzig: H. John, 1907), 66, our translation; the original German reads: 'Die Diktion ist nicht die Nashs in seinen sonstigen Prosaschriften; alles charakteristische seiner Sprache fehlt. Das Persönliche, das bei ihm stets im Vordergrund steht, tritt hier ganz zurück. Nach einer so starken Herausforderung, wie Nash sie durch die Brüder Harvey erfahren hatte, würde er sicherlich mehrere Male von seinem Thema abgeschweift sein und Ausfälle gegen seine Beleidiger unternommen haben. Die feine Ironie ohne alle persönlichen Spitzen widerspricht völlig seinem beißenden Spott, der, untermischt mit kräftigen Schmähungen, niemals in Zweifel läßt, wen er trifft.'

F. P. Wilson, who later reprinted McKerrow's edition with corrections and supplementary notes, expressed similar doubts about Nashe's authorship of *A Wonderful Prognostication* since, 'with a writer with so distinctive a style, not to be convinced that it is his is almost to be certain that it is not'.[44] By contrast, more recent commentators have deemed the attribution plausible. For Willem Schrickx, not only is 'the very vocabulary' of *A Wonderful Prognostication* 'entirely consistent with that of Nashe's genuine writings', but its 'complaints of pennilessness' and topical references are tantamount to Nashe having 'written his own signature'.[45] Charles Nicholl suggests *A Wonderful Prognostication* could have been written by Nashe 'to tilt at Richard Harvey and his much-ridiculed *Astrologicall Discourse*', and, with its references to the Marprelate controversy and intimate knowledge of the city, 'might perhaps anticipate the sharply realized London ambiance of *Pierce Pennilesse*'.[46] Anne Lake Prescott also tentatively ascribes authorship to Nashe,[47] though other critics such as Swapan Chakravorty put the attribution in the past by saying it was 'once attributed to Nashe'.[48] Twenty-first-century scholarship continues to ascribe authorship to Nashe, though with some uncertainty. For Matthew Steggle, *A Wonderful Prognostication* 'lurks at the edge of the Nashe canon', reflecting 'how close the conceit of a mock-astronomer is to Nashe's general satirical repertory'.[49] Walker also treats the text as Nashe's by virtue of its relationship to the Marprelate controversy.[50]

The attribution of *Two Dangerous Comets* shares a similar historical trajectory with *A Wonderful Prognostication*, though the text itself has attracted considerably less scholarly attention. The same early attribution of *A Wonderful Prognostication* that escaped McKerrow's attention also associates *Two Dangerous Comets* with Nashe: as reported by Edmond Malone, George Steevens identified *Two Dangerous Comets* as 'by Nashe, in ridicule of Gabriel Harvey' in his commentary on Shakespeare's *Henry IV, Part Two*.[51] Had he

[44] F. P. Wilson, 'Some English Mock-Prognostications', *The Library*, 4th series, 19.1 (1938), 6–43 (23). Wilson announced his misgivings much earlier, describing the pamphlet in 1918 as 'well known to bibliographers as a work attributed without evidence to the pen of Thomas Nashe' ('A Wonderfull Prognostication (1591)', 84).

[45] Willem Schrickx, *Shakespeare's Early Contemporaries: The Background of the Harvey–Nashe Polemic and 'Love's Labour's Lost'* (Antwerp: De Nederlandsche Boekhandel, 1956), 150–3. Schrickx rehearses these ideas in 'Onion, a Sobriquet Relevant to Thomas Nashe?', *Revue des langues vivantes* 27 (1961), 322–8.

[46] Charles Nicholl, *A Cup of News: The Life of Thomas Nashe* (London: Routledge & Kegan Paul, 1984), 81; 82.

[47] Prescott, *Imagining Rabelais*, 246, n2.

[48] Swapan Chakravorty, '"Upon a Sudden Wit": On the Sources of an Unnoticed Pun in *The Revenger's Tragedy*, *Notes and Queries*, 42: 3 (1995), 344–345 (345).

[49] Matthew Steggle, *Digital Humanities and the Lost Drama of Early Modern England: Ten Case Studies* (Aldershot: Ashgate, 2015), 36.

[50] Walker, 'Daring to Pry', 143.

[51] Malone (ed.), *Supplement*, I: 189.

known this, McKerrow may not have proposed Anthony Munday as *Two Dangerous Comets'* likely author on the scantest evidence: 'joking on the days of the week, in which Monday is said to be the best of all'.[52] Consequently, *Two Dangerous Comets* was excluded from the edition and mention of it limited to establishing a chronology—since Smellknave opens his 'Epistle to the Reader' by describing '*Adam Fowle-wether*' as his 'familiar friende' and crediting his 'learned Astonomicall discourse' as the impetus for his own offering,[53] it must have appeared after *A Wonderful Prognostication*—and glossing an allusion to a ballad in Nashe's *Have with You to Saffron Walden*.[54] The text has never appeared in a modern edition. Ironically, McKerrow's attribution of *Two Dangerous Comets* to Munday seems also to have gone largely unnoticed,[55] with what little discussion the pamphlet has garnered content to treat it as an anonymous work. Instead, critical conversation has focused almost exclusively on Thomas Middleton's revision of *Two Dangerous Comets* into *The Penniless Parliament of Threadbare Poets*,[56] 'changes and additions' which, although 'quantitatively marginal', nonetheless 'converted the relatively obscure text of Smellknave into a work which had at least six editions between 1601 and 1649'.[57]

While stylistic similarities between the 1591 mock-prognostications have been observed,[58] only Donna N. Murphy has gone so far as to make a positive attribution based on phrasal matches in *Two Dangerous Comets* and Nashe's other acknowledged works.[59] In short, consensus about Nashe's authorship of *A Wonderful Prognostication* has yet to be reached or, in the case of *Two Dangerous Comets*, seriously considered.

[52] McKerrow (ed.), *Works of Nashe*, IV: 477. The joke to which McKerrow refers appears in the 'Epilogue', where Smellknave swears 'Munday' to be 'the best day in all the weeke' in a wager with an oysterwife (*Two Dangerous Comets*, sig. D2v).

[53] *Two Dangerous Comets*, sig. A2r.

[54] McKerrow (ed.), *Works of Nashe*, IV: 477, 335 n26.

[55] Schrickx alone appears to have accepted McKerrow's suggestion; see *Shakespeare's Early Contemporaries*, 149.

[56] Although entered into the Stationers' Register in August 1601, the earliest extant copy dates to 1604, where it is printed as the second part of *Iacke of Dover, his Quest of Inquirie* (London, 1604; *STC* 14291); the next extant edition is *The penniles parliament of Threed-bare Poets* (London, 1608; *STC* 19307).

[57] Swapan Chakravorty, *Society and Politics in the Plays of Thomas Middleton* (Oxford: Oxford University Press, 1996), 37–8. See also Swapan Chakravorty (ed.), *The Penniless Parliament of Threadbare Poets*, in Gary Taylor and John Lavagnino (gen. eds.), *Thomas Middleton and Early Modern Textual Culture* (Oxford: Oxford University Press, 2007), 337–45, 469–73.

[58] Acknowledging that *A Wonderful Prognostication* was 'once attributed to Thomas Nashe', Swapan Chakravorty, for example, notes that pun on 'sudden' and 'sodden' appears in both *Pierce Penniless* and *Two Dangerous Comets*: '"Upon a Sudden Wit": On the Sources of an Unnoticed Pun in *The Revenger's Tragedy*', *Notes & Queries*, 42.3 (1995), 344–6 (345).

[59] Donna N. Murphy, '*Two Dangerous Comets* and Thomas Nashe', *Notes & Queries*, 58.2 (2011), 219–23.

NASHE, THE HARVEYS AND ASTROLOGY

One of McKerrow's concerns regarding the authorship of *Comets* is that it was intended as a parody of Richard Harvey's *Astrological Discourse*,[60] arguing that 'a parody of an ephemeral production which had appeared eight years earlier would be but a pointless jest'.[61] Indeed, parodying a text that was 8 years old does seem small-minded and pointless. But this is Nashe we are talking about, from whose pen flowed 'mortall Aconite' to his enemies,[62] and to whom the lapse of 8 years would be nothing were his satire and ridicule still to be recognised. Richard Harvey's *Astrological Discourse* is a prediction of the effects of the Great Conjunction of 28th April 1583, a conjunction of Saturn and Jupiter which only takes place approximately once every 20 years and so of some astrological significance. This particular Great Conjunction was 'of a very rare and significant kind' because these two planets, the highest planets, were to be conjoined not only in a new sign but also in a new triplicity or trigon as they moved from the watery to the fiery trigon, marking the end of an 800-year astrological cycle and the birth of a new one.[63] Richard's predictions, then, were less likely to be forgotten than for a more pedestrian astrological event. Prophecies about the end of the world were common and people's fear was all too real. Richard Harvey 'went far beyond the ordinary discretion practised by any sensible astrologer',[64] however, and the wording of his prediction seemed to suggest that strong winds would begin to blow at exactly 12 noon on 28th April:

> The *28.* of *April* being Sunday, about high noone, there shal happen a very greate and notable Conjunction of the two superiour and weightie Planets *Saturne* and *Jupiter*, which Conjunction shall be manifested to the ignorant sort, by many fierce & boysterous windes then sodenly breaking out & continuing certain daies before and certaine dayes after the same Conjunction.[65]

Given the heightened anxiety surrounding the Great Conjunction of 1583, Richard's confident assertion quickly became ludicrous when nothing happened. Not even a breeze, auspicious or otherwise. Indeed, Richard's claims were so specific that his reputation suffered when they failed to materialise and, as Walter B. Stone suggests, 'the Harvey family never recovered from the blow'.[66] Furthermore, Greene targeted Richard Harvey in the first edi-

[60] Richard Harvey, *An astrological discourse* (London, 1583; *STC* 12910).

[61] McKerrow (ed.), *Works of Nashe*, V: 138.

[62] Thomas Dekker, *Newes from hell* (London, 1606; *STC* 6514), sig. C2v.

[63] Margaret Aston, 'The Fiery Trigon Conjunction: An Elizabethan Astrological Prediction', *Isis*, 61.2 (1970), 158–87 (160).

[64] Walter B. Stone, 'Shakespeare and the Sad Augurs', *Journal of English and Germanic Philology*, 52 (1953), 457–79 (464).

[65] Harvey, *An astrological discourse*, sigs. A4r–v.

[66] Stone, 'Shakespeare and the Sad Augurs', 466.

tion of his *A Quip for an Upstart Courtier* (1592), a year after the mock-prognostications under discussion. In Greene's pamphlet, a ropemaker—the occupation of Harvey senior—discusses the careers of his three sons, the second being 'a Physitian or a foole, but indeed a physitian, & had proued a proper man if he had not spoiled himselfe with his Astrological discourse of the terrible coniunction of Saturne and Iupiter'.[67] Thus, an astrological prediction of 8 years previous was still worth satirising and was very much alive within cultural memory, including erroneous predictions which, previously feared, became the source of amusement and ridicule. Richard Harvey was clearly still an easy target when Nashe penned his mock-prognostications.

The link between the Harveys and prognostication in the public mind was no doubt refreshed when Richard's brother, John Harvey, published an almanac in 1589.[68] John had previously entered the fray to clarify Richard's prognostication from anticipated misconception, producing an *Astrological Addition* prior to the Great Conjunction 'to adde vnto [Richard's] *Astrological Disco*[u]*rse*, what I (vpo[n] some co[n]ference) thought, might reasonablie be demaunded, as therein requisite'.[69] Margaret Aston suggests that 'it was clear that a main motive for the *Addition* was the defense of Richard from his critics, to stop the mouths of his envious and carping enemies'.[70] With the aid of horoscopes, notably missing from Richard's pamphlet, John's *Addition* provides further support for the conjunction 'of the two most waightye Planets, Saturne and Iupiter, in the ende of the Trigonisme, namely in the third and last face of Pisces, and the 21. de[…] the same signe. Anno 1583. the 28. day of Aprill, a little before high […]'.[71] Though the text is obscured (see Fig. 1), John is referring to high noon or midday, which corroborates his brother's prediction.

Unfortunately for John, this diagram was replicated on the title page of Smellknave's pamphlet (Figs. 2 and 3), which shows that Nashe was directly engaging with the Harveys' contributions to the astrological predictions for the Great Conjunction of 1583.

The use of this image cannot have been an accident; it serves to create a direct visual link between the two texts while also allowing the

[67] Robert Greene, *A quip for an upstart courtier* (London, 1592; *STC* 12300), sigs. E3v–E4r. Greene had this passage removed during the printing process, possibly due to the death of John Harvey in 1592. On the textual history of the *Quip*, see Edwin Haviland Miller, 'Deletions in Robert Greene's *A Quip for an Upstart Courtier* (1592)', *Huntington Library Quarterly*, 15.3 (1952), 277–82; R. B. Parker, 'Alterations in the First Edition of Greene's *A Quip for an Upstart Courtier* (1592)', *Huntington Library Quarterly*, 23.2 (1960), 181–86; and I. A. Shapiro, 'The First Edition of Greene's *Quip for an Upstart Courtier*', *Studies in Bibliography*, 14 (1961), 212–18.

[68] John Harvey, *An Almanacke, or annuall Calender, with a compendious Prognostication* (London, 1589; STC 455.7).

[69] John Harvey, *An astrologicall addition, or supplement* (London, 1583; *STC* 12907), sig. B1r.

[70] Aston, 'Fiery Trigon', 170.

[71] Harvey, *An astrologicall addition*, sig. B5r.

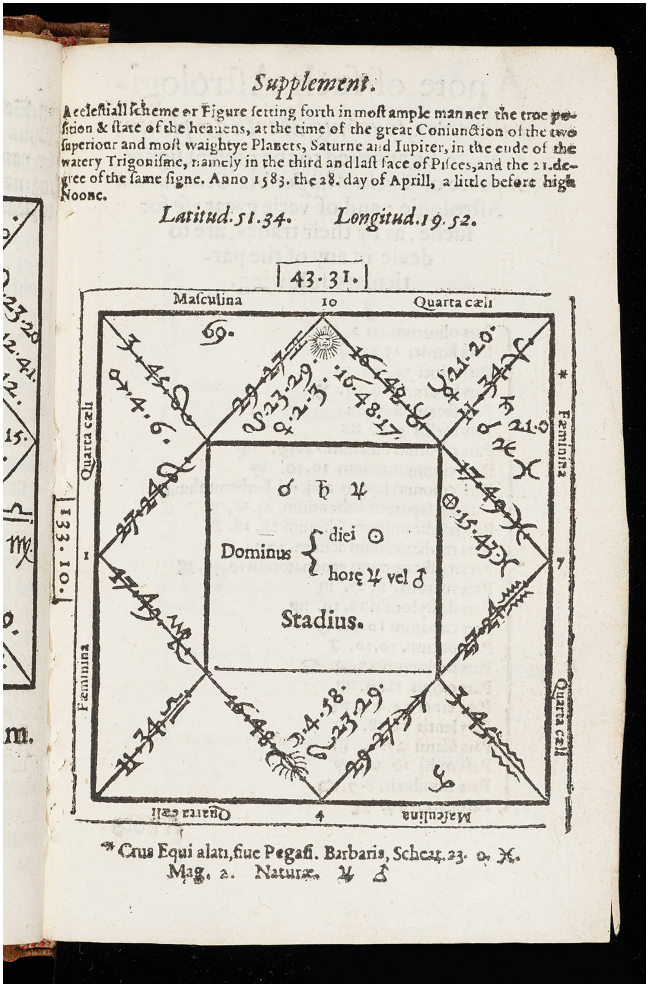
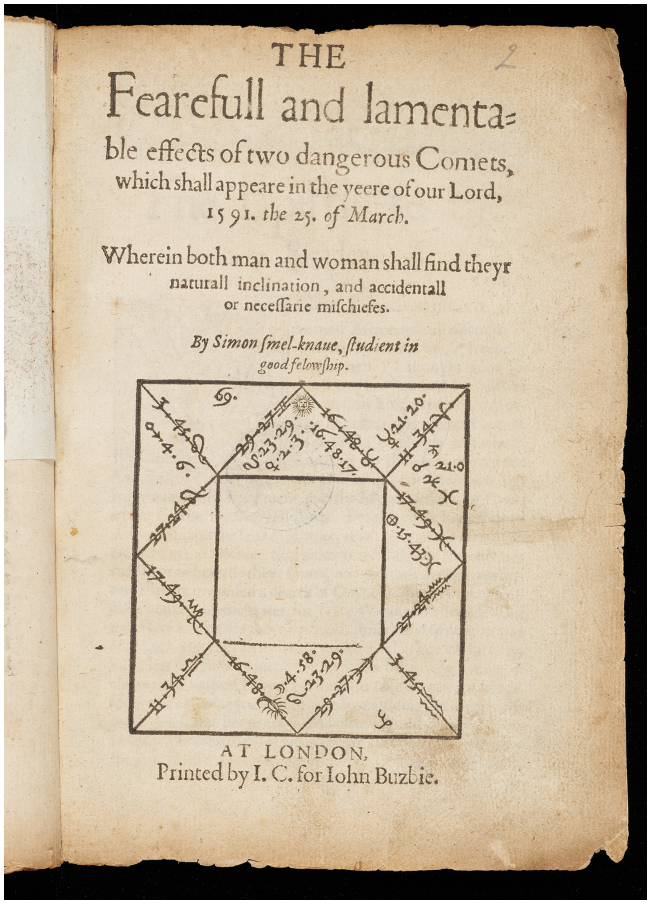


Fig. 1 John Harvey, *An astrologicall addition*, sig. B5r. Don. f.542, Bodleian Libraries, Oxford

mock-prognostication to imitate the genuine article at first glance. There is also a slight variation between the two extant copies of *Comets*: whereas the centre of the horoscope in the Bodleian copy is blank, the words 'Twelve a clocke at midnight' are printed in the British Library copy (Fig. 3). This addition to the British Library copy points more specifically to the Harveys' astrological pamphlets and recalls Richard's ill-judged precision in predicting high winds to occur at 'high noone'. Even if the Harveys were not the sole intended target of the mock-prognostications, Nashe's reuse of this horoscope, visually and textually, makes the link clear. Furthermore, John's almanac of 1589 has a horoscope on its title page, an unusual feature for



THE

Fearefull and lamenta=
ble effects of two dangerous Comets,
which shall appeare in the yeere of our Lord,
1591. *the 25. of March.*

Wherein both man and woman shall find theyr
naturall inclination, and accidentall
or necessarie mischiefes.

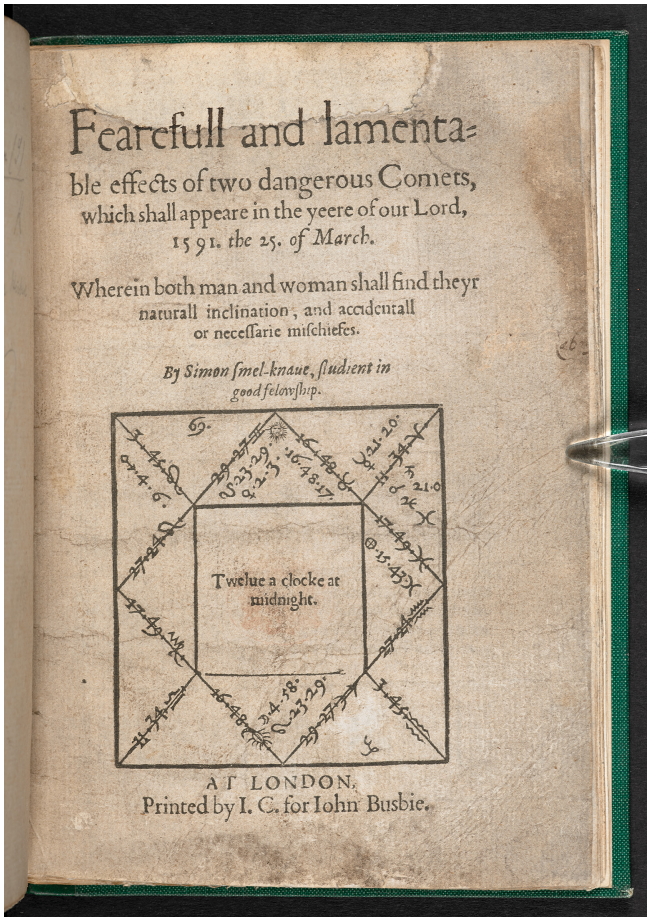
By Simon smel-knaue, student in good felowship.

AT LONDON,
Printed by I. C. for Iohn Buzbie.

Fig. 2 *Two Dangerous Comets*, titlepage. Mal. 729 (2), Bodleian Libraries, Oxford

almanacs which were distinctive in their use of black and red type. While it is different to the horoscope in the *Addition*, by making the unusual visual choice to include a horoscope on the title page Smellknave is also purposefully imitating John's 1589 almanac. That the writer of the mock-prognostications knew of John's publication is further confirmed by Foulweather's claim in the opening letter that 'Astrologie is not so certaine, but it may fayle',[72] which seems to be contradicting John's assertation that 'the knowledge of many thynges by Astronomie, doth much good to many'.[73]

[72] Foulweather, *Wonderfull Prognostication*, sig. A2r.
[73] Harvey, *An Almanacke*, sig. B2r.



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naturall inclination, and accidentall
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By Simon smel-knaue, studient in good felowship.

Twelue a clocke at midnight.

AT LONDON,
Printed by I. C. for Iohn Busbie.

Fig. 3 *Two Dangerous Comets*, titlepage. C.122.bb.12, British Library, London

MANUFACTURING RIVALRY

Fairweather's pamphlet is the only 1591 mock-prognostication to be listed in the Stationers' Register, where it is entered for the publisher William Wright. According to their titlepages, *A Wonderful Prognostication* was printed by Thomas Scarlet (for an unnamed publisher) and *Two Dangerous Comets* was printed by John Busby for 'I. C.'—that is, John Charlewood, a printer and publisher. Both Scarlet and Charlewood had also previously printed for William Wright.[74] Given the pre-existing working relationships between Wright, Scarlet and Charlewood,

[74] For example, Scarlet printed Richard Alison's *A plaine confutation of a treatise of Brownisme* (London, 1590; *STC* 355) and Charlewood printed Anthony Munday's *A breefe and true reporte, of the execution of certaine traytours at Tiborne* (London, 1582; *STC* 18261) for Wright.

it is certainly possible that Scarlet or Charlewood could also have printed the lost Fairweather pamphlet and that Wright may have been the unnamed publisher of *A Wonderful Prognostication*.

John Busby has gained a reputation as a rogue printer among scholars, but Gerald D. Johnson notes that he was 'an exceptionally law abiding member' of the Stationers' Company from his admittance in 1585 until he turned his attention to drama in 1599.[75] Johnson describes Busby as a 'successful procurer of authorized manuscripts' during the 1590s—for instance, he acquired Nashe's *Pierce Penniless* in 1592.[76] His publishing of *Two Dangerous Comets* thus marks an early stage of his relationship with Nashe. In addition to printing for both Wright and Busby, Charlewood also had connections to Nashe, having printed *The Anatomy of Absurdity*, *Pierce Penniless* and several of the anti-Martinist texts attributed to Nashe.[77] According to MacDonald P. Jackson, Charlewood also printed the unauthorized first quarto edition of Sir Philip Sidney's *Astrophil and Stella*, for which Nashe supplied a preface.[78] Jackson identified Charlewood on the basis of his compositorial habits, including the use of a 'highly distinctive head-piece', a 'decorative six-point star and three dots within parentheses' and the setting of fleurons.[79] The same 'highly distinctive head-piece' is present in *Two Dangerous Comets*,[80] which suggests that Charlewood may have participated in—or at least overseen—the printing of the pamphlet.

If Wright published *A Wonderful Prognostication*, why did Nashe seemingly engage the services of another publisher for *Two Dangerous Comets*? Writers in this period often worked with printers and publishers with whom they had existing relationships; that the mock-prognostications may have different publishers might, therefore, suggest they were written by different authors. Without Fairweather's pamphlet or a suggestion as to their identity, it is impossible to know whether they, too, were working with publishers and printers with whom they already had established relationships. One possible explanation is that Nashe enlisted the services of different publishers for the same

[75] Gerald D. Johnson, 'John Busby and the Stationers' Trade, 1590–1612', *The Library*, sixth series, 7.1 (1985), 1–15 (3).

[76] Johnson, 'John Busby', 6; Thomas Nashe, *Pierce Penilesse his supplication to the Diuell* (London, 1592; *STC* 18372).

[77] Thomas Nashe, *The anatomie of absurditie* (London, 1589; *STC* 18364) and its reprint the following year (*STC* 18365); *Pierce Penilesse his Supplication to the Diuell* (London, 1592; *STC* 18371); Pasquill of England [Thomas Nashe], *A Countercuffe* ([London], 1589; *STC* 19456.5), *The Returne of the renowned Caualiero Pasquill of England* ([London], 1589; *STC* 19457.3), and *The First parte of Pasquils Apologie* ([London], 1590; *STC* 19450).

[78] Sir Philip Sidney, *Syr P.S. His Astrophel and Stella* (London, 1591; STC 22536); MacDonald P. Jackson, 'The Printer of the First Quarto of *Astrophil and Stella* (1591)', *Studies in Bibliography*, 31 (1978), 201–3.

[79] Jackson, 'The Printer', 201–2.

[80] *Two Dangerous Comets*, sigs. A3r, C3r.

reason he adopted different pseudonyms in the mock-prognostications: what appears to be 'apparent rivalry',[81] in other words, may be entirely manufactured. As Don Cameron Allen remarks, Smellknave's 'debts' to Foulweather 'are never verbal steals': whenever Smellknave 'follows the tune' of Foulweather, 'he has always the good taste to alter the lyric'.[82] Where Allen sees an author 'mindful of the intellectual property of others', we might instead see an artificially constructed *tête-à-tête*, a playful but no less strategic composition with two characters, but one mind at work.

ATTRIBUTION TESTING

Stylometric analysis strengthens the case for Nashe's sole authorship of both extant mock-prognostications.[83] In this section, we describe the procedures and results of five different tests using two different methods now standard in attribution study and which together yield better cross-validation and, thus, more accurate results. Attribution testing of this kind requires a corpus of machine-readable texts from which to generate authorial profiles for each candidate to compare with *A Wonderful Prognostication* and *Two Dangerous Comets*.[84] To ensure the accuracy of these profiles, only sole-authored, well-attributed texts are included—as far as possible, works of collaborative or uncertain authorship, dubious attribution or questionable provenance must be avoided. A pertinent example is *Greene's Groatsworth of Wit*, a pamphlet salaciously advertised as the deathbed repentance of Robert Greene, 'Describing the follie of youth, the falshood of makeshifte flatterers, the miserie of the negligent, and mischiefes of deceiuing courtezans',[85] which bibliographical examination and stylometric study have suggested instead to be the work of Henry Chettle.[86] These findings have not gone unchallenged;[87] since the true authorship of *Greene's Groatsworth of Wit* remains unclear, we deem

[81] McKerrow (ed.), *Works of Nashe*, V: 139.

[82] Don Allen Cameron, *The Star-Crossed Renaissance: The Quarrel about Astrology and Its Influence in England* (Durham: Duke University Press, 1941), 222.

[83] Since there is no suggestion of collaboration, our testing proceeds on the assumption that each pamphlet represents the work of a single author. We repeated the tests described below using 2,000-word non-overlapping segments (with any smaller remainder excluded) instead of whole texts—that is the standard procedure when trying to identify individual authorial shares in a collaborative text—and the results confirmed our earlier findings.

[84] For a reader-friendly overview of authorship attribution in principle and practice, see Harold Love, *Attributing Authorship: An Introduction* (Cambridge: Cambridge University Press, 2002).

[85] *Greenes, groats-worth of witte* (London, 1592; *STC* 12245), title page.

[86] John Jowett, 'Johannes Factotum: Henry Chettle and *Greene's Groatsworth of Wit*', *Publications of the Bibliographical Society of America*, 87.4 (1993), 453–86; Warren B. Austin, *A Computer-Aided Technique for Stylistic Discrimination: The Authorship of 'Greene's Groatsworth of Wit'* (Washington: US Department of Health, Education, and Welfare, 1969).

[87] Richard Westley, 'Computing Error: Reassessing Austin's Study of *Groatsworth of Wit*', *Literary and Linguistic Computing*, 21.3 (2006), 363–78; Brian Vickers, '"Upstart Crow"? The Myth of Shakespeare's Plagiarism', *The Review of English Studies*, 68.284 (2017), 244–67.

it safer to exclude it from our analysis.[88] We likewise exclude *Pap with a Hatchet*,[89] one of the racier anti-Martinist retorts now generally thought to be by John Lyly, but which was 'first and in early times most persistently attributed' to Nashe.[90] Since genre is thought to constrain an author's style, attribution testing also typically compares only like with like—plays with plays, non-dramatic verse with non-dramatic verse and so on. For this reason, we limit our corpus to works of non-dramatic prose.[91]

Given the context of the mock-prognostications in relation to the Martin Marprelate controversy and the feud with the Harveys, we draw our pool of candidate authors from those professional writers known to have produced anti-Martinist tracts or associated with them: Robert Greene, John Lyly, Anthony Munday and Thomas Nashe.[92] Table 1 lists our corpus of 35 representative sole-authored, well-attributed prose works by these authors, as well as *A Wonderful Prognostication* and *Two Dangerous Comets*, along with their source texts and dates of publication.

Whole texts are not used to construct authorial profiles; instead, certain variables (or so-called *features*) are selected for their power to discriminate between authors. The features chosen for several methods we employ are counts of the most frequent words across the corpus, of which *function words*—that is, words that function primarily to express grammatical relationships among other words in a sentence and which carry little, no or ambiguous lexical content—make up the bulk. Because they are essential to the structuring of sentences, function words are among the most commonly used in a language and have become one of the most popular and best-understood features selected for authorship attribution.[93] In addition to being high-frequency and ubiquitous, function words appear to be less constrained by context (such as genre or subject matter) and perhaps even

[88] We exclude *The Repentance of Robert Greene* (London, 1592; *STC* 12306) for similar reasons, though it appears to have been edited rather than written by Chettle; see: Jowett, 'Johannes Factotum'; Harold Jenkins, 'On the Authenticity of *Greene's Groatsworth of Wit* and *The Repentance of Robert Greene*', *The Review of English Studies*, 11.41 (1935), 28–41; and Derek B. Alwes, *Sons and Authors in Elizabethan England* (Newark: U of Delaware P, 2004), 145–6.

[89] *Pappe with an hatchet* ([London], [1589]; *STC* 17463).

[90] McKerrow (ed.), *Works of Nashe*, V: 49.

[91] To be thorough, we repeated our analyses using an enlarged mixed-genre corpus of plays and non-dramatic prose; this had no significant effect on the results.

[92] For a discussion of the controversy and the authors suspected or confirmed, see Joseph L. Black (ed.), *The Martin Marprelate Tracts* (Cambridge: Cambridge UP, 2008); Donald J. McGinn, 'Nashe's Share in the Marprelate Controversy', *PMLA*, 59.4 (1944), 952–84; and McKerrow (ed.), *Works of Nashe*, V: 34–65.

[93] See Patrick Juola, 'Authorship Attribution', *Foundations and Trends in Information Retrieval*, 1.3 (2006), 233–334; Roger D. Peng and Nicolas W. Hengartner, 'Quantitative Analysis of Literary Styles', *The American Statistician*, 56.3 (2002), 175–85; and, Antonio Miranda García and Javier Calle Martín, 'Function Words in Authorship Attribution Studies', *Literary and Linguistic Computing*, 22.1 (2007), 49–66.

Table 1 *A Wonderful Prognostication, Two Dangerous Comets* and representative well-attributed, sole-authored prose works by Greene, Lyly, Munday and Nashe.

Author	Title	Source	Date	Words
Greene, Robert	*1 Cony-catching*	*STC* 12280	1592	12,590
Greene, Robert	*2 Cony-catching*	*STC* 12281	1591	14,479
Greene, Robert	*3 Cony-catching*	*STC* 12283.5	1592	12,068
Greene, Robert	*Arbasto*	*STC* 12219	1589	18,358
Greene, Robert	*The Black Book's Messenger*	*STC* 12223	1592	7,280
Greene, Robert	*Ciceronis Amor*	*STC* 12224	1589	26,156
Greene, Robert	*A Disputation*	*STC* 12234	1592	19,578
Greene, Robert	*Farewell to Folly*	*STC* 12241	1591	28,117
Greene, Robert	*Menaphon*	*STC* 12272	1589	24,898
Greene, Robert	*Mourning Garment*	*STC* 12251	1590	19,698
Greene, Robert	*Never Too Late*	*STC* 12253	1590	44,328
Greene, Robert	*Orpharion*	*STC* 12260	1599	19,918
Greene, Robert	*Pandosto*	*STC* 12285	1588	17,108
Greene, Robert	*Penelope's Web*	*STC* 12294	1601	12,265
Greene, Robert	*Perimedes the Blacksmith*	*STC* 12295	1588	16,702
Greene, Robert	*Philomela*	*STC* 12296	1592	21,524
Greene, Robert	*Planetomachia*	*STC* 12299	1585	34,048
Greene, Robert	*A Quip for an Upstart Courtier*	*STC* 12300	1592	20,891
Greene, Robert	*Vision*	*STC* 12261	1592	19,060
Lyly, John	*Euphues, the Anatomy of Wit* [extract]	*STC* 17051	1578	57,551
Lyly, John	*Euphues and His England* [extract]	*STC* 17070	1580	62,620
Munday, Anthony	*A Brief Answer*	*STC* 18262	1582	10,770
Munday, Anthony	*A Courtly Controversy*	*STC* 18268	1581	9,399
Munday, Anthony	*The English Roman Life*	*STC* 18272	1582	22,977
Munday, Anthony	*A Watchword to England*	*STC* 18282	1584	33,221
Munday, Anthony	*Zelauto, the Fountain of Fame*	*STC* 18283	1580	42,096
Nashe, Thomas	*The Anatomy of Absurdity*	*STC* 18364	1589	15,369
Nashe, Thomas	*Christ's Tears over Jerusalem*	*STC* 18368	1613	56,782
Nashe, Thomas	*Have with You to Saffron Walden*	*STC* 18369	1596	46,401
Nashe, Thomas	*Lenten Stuff*	*STC* 18370	1599	26,986
Nashe, Thomas	*Pierce Penniless*	*STC* 18373	1592	30,414
Nashe, Thomas	Preface to *Menaphon*	*STC* 12272	1589	4,356
Nashe, Thomas	*Strange News*	*STC* 18377A	1592	25,192

(Continues)

Table 1 (Continued)

Author	Title	Source	Date	Words
Nashe, Thomas	*The Terrors of the Night*	*STC* 18379	1594	14,664
Nashe, Thomas	*The Unfortunate Traveler*	*STC* 18380	1594	40,983
Uncertain	*Two Dangerous Comets*	*STC* 22645	1591	6,214
Uncertain	*A Wonderful Prognostication*	*STC* 11210	1591	5,369

'lie outside the conscious control of authors',[94] which may mean they better reflect a consistent authorial style than lexical or so-called *content* words. Personal pronouns are an exception: several studies have shown their use often to be correlated with genre and, in the case of literary works, the gender of characters;[95] for this reason, we exclude personal pronouns from our feature selection.

Base transcriptions of the texts listed in Table 1 were obtained from the Early English Books Online Text Creation Partnership (EEBO-TCP); contractions were then expanded, and function words were annotated to distinguish between (and thereby enable distinct counts to be made for) homograph forms, such as the adverb and preposition forms of the word *in*.[96] As appropriate, *youle* was expanded as an instance of *you* and one of $will_{\text{verb}}$, *ins* as an instance of $in_{\text{preposition}}$ and one of *his*, and so on. Potentially non-authorial material such as prefatory matter was excluded on a case-by-case basis.[97] Since our interest is in individual words, we are not concerned with punctuation; however, to facilitate more accurate counting of lexical words, we used VARD 2, a software application designed to automatically normalise spelling variants in historical corpora.[98] As an example, the opening sentence of Greene's *Menaphon*—'After that the wrath of mightie

[94] David L. Hoover, 'Statistical Stylistics and Authorship Attribution: An Empirical Investigation', *Literary and Linguistic Computing*, 16.4 (2001), 421–44 (422); see also Cindy Chung and James Pennebaker, 'The Psychological Functions of Function Words', in Klaus Fiedler (ed.), *Social Communication: Frontiers of Social Psychology* (New York: Psychology P, 2007), 343–59.

[95] See, for example, Barron Brainerd, 'Pronouns and Genre in Shakespeare's Drama', *Computers and the Humanities*, 13.1 (1979), 3–16, and David L. Hoover, 'Multivariate Analysis and the Study of Style Variation', *Literary and Linguistic Computing*, 18.4 (2003), 341–60.

[96] In all, we annotate 224 different function words, of which 37 are personal pronouns.

[97] The text of *Menaphon*, for example, has been split into the main text (by Greene) and the preface (by Nashe).

[98] Alistair Baron, VARD 2, version 2.5.4, 2021, https://ucrel.lancs.ac.uk/vard. Although automation always involves a trade-off between accuracy and scale, the use of tools such as VARD 2 ensures a high level of consistency and for this reason, has become standard in linguistic and stylistic analysis of historical corpora; see Anupam Basu, '"Ill shapen sounds, and false orthography": A Computational Approach to Early English Orthographic Variation', in Laura Estill, Diane K. Jakacki, and Michael Ullyot (eds), *Early Modern Studies after the Digital Turn* (Toronto: Iter Press, 2016), 167–200. This is, of course, compounded by the accuracy of the underlying EEBO-TCP transcriptions; see Matthew Milner, Stephen Wittek, and Stéfan Sinclair, 'Introducing DREaM (Distant Reading Early Modernity', *Digital Humanities Quarterly*, 11.4 (2017).

Ioue, had wrapt Arcadia with noysome pestilence, in so much that the ayre yeelding preiudiciall sauors, seemd to be peremptory in some fatall resolution'—is annotated and normalised following this procedure as 'After that-$_{\text{conjunction}}$ the wrath of mighty Jove, had wrapped Arcadia with noisome pestilence, in$_{\text{preposition}}$ so$_{\text{adverbDegree}}$ much air yielding prejudicial savours, seemed to$_{\text{infinitive}}$ be peremptory in$_{\text{preposition}}$ some fatal resolution'. Table 1 also lists the total words for each text counted as *tokens*, including homograph and normalised forms.[99]

With the corpus prepared and annotated as described, we use a software application called Intelligent Archive to count the frequency of the top 250 most frequent words (excluding personal pronouns) across the corpus in tokens.[100] Since the texts vary in size, the frequency counts are recorded as proportions of total tokens to enable direct comparison. The result is a large table with 37 rows (one for each text) and 250 columns (one for each of the most frequent words, excluding personal pronouns).[101] Using this table of word-frequency proportions, we can calculate stylistic 'distances' between the mock-prognostications and the representative prose texts by Greene, Lyly, Munday and Nashe, with the assumption that the author whose texts are closest by this measure is the least unlikely author. A standard method for this task is Delta,[102] which begins by transforming the word-frequency proportions into *z*-scores (i.e. by subtracting the mean and then dividing by the standard deviation of the proportions for each word across all the texts), and then calculating absolute differences (i.e. ignoring whether the figures are positive or negative) between the mean *z*-scores for each author and the corresponding *z*-score in the text of uncertain authorship. The absolute differences are then combined to produce a composite measure of difference or 'Delta' distance for each author.

To test the method, we conduct 'leave one out' cross-validation using Nashe—that is, we conduct a series of tests, treating each Nashe text in turn as if it were of unknown authorship and, using the remaining corpus, calculate Delta distances for each author from that text. Table 2 gives the results of the cross-validation, with the lowest Delta distance in each run

[99] Words are often counted as unique forms (*types*) or as concrete instantiations of those forms (*tokens*). For example, 'the cat sat on the mat' contains five word types (*the*, *cat*, *sat*, *on* and *mat*) and six word tokens (i.e. two instances of *the*, and one instance of all remaining word types).

[100] Centre for Literary and Linguistic Computing, University of Newcastle, Australia, *Intelligent Archive*, version 3.0 beta (Rosella), 2018, https://c21ch.newcastle.edu.au/ia/. The choice of 250 features is somewhat arbitrary, but it aligns with the findings of Peter W. H. Smith and W. Aldridge, who demonstrate that between 200 and 300 features give the most accurate results when using the Delta method: 'Improving Authorship Attribution: Optimizing Burrows' Delta Method', *Journal of Quantitative Linguistics*, 18.1 (2011), 63–88.

[101] This table, in CSV format, is available to download from https://github.com/JackWilton1594/RS-Nashe.

[102] John Burrows, 'Delta: A Measure of Stylistic Difference and a Guide to Likely Authorship', *Literary and Linguistic Computing*, 17.3 (2002), 267–86; see also David L. Hoover, 'Testing Burrows's Delta', *Literary and Linguistic Computing*, 19.4 (2004), 453–75.

Table 2 Delta distances between a hold-out Nashe text and four candidate authors as represented in Table 1, using the top 250 most frequent words (excluding personal pronouns).

Test Text	Delta distance			
	Greene	Lyly	Munday	Nashe
Anatomy of Abuses	244.71	256.55	252.84	208.34
Christ's Tears over Jerusalem	236.66	275.30	241.21	156.84
Have with You to Saffron Walden	209.76	264.63	221.52	129.52
Lenten Stuff	206.25	299.72	240.81	156.67
Pierce Penniless	194.28	249.97	205.76	118.15
Preface to *Menaphon*	311.89	342.73	318.90	261.20
Strange News	232.17	261.18	235.66	140.77
The Terrors of the Night	231.39	273.44	249.55	152.86
The Unfortunate Traveler	183.38	290.36	202.64	138.29

Lowest Delta distance in each run shaded.

shaded. According to Table 2, Nashe has the lowest Delta distance in every run—in other words, the method has correctly identified Nashe as the least unlikely author when holding out and treating one of his texts as if it were of unknown authorship.

Satisfied that the method is sound, we repeat the procedure to calculate the Delta distances of *Two Dangerous Comets*, and then *A Wonderful Prognostication*, from texts by Greene, Lyly, Munday and Nashe. The results of the test suggest that Lyly is the most unlikely author of *Two Dangerous Comets* and *A Wonderful Prognostication*, with Delta distances of 350.15 and 374.38, respectively. Munday is the next most unlikely author, with Delta distances of 342.84 and 348.66. Of the remaining candidates, Nashe emerges as the least unlikely author with Delta distances of 288.59 and 301.49, versus Greene's 327.68 and 312.36. To test these results, we conduct a 'leave one out' cross-validation using the whole corpus, excluding each text from the analysis in turn and repeating the procedure. Table 3 gives the results, in which Nashe scores the lowest Delta distance from *Two Dangerous Comets* and *A Wonderful Prognostication* in all 35 iterations.

With these results, we can confidently exclude Lyly and Munday as candidates; however, further testing using a different method and feature selection is necessary to independently confirm the greater likelihood of Nashe's authorship. 'It makes sense that writers have preferences for some words, and a tendency to neglect others', and these authorial habits extend beyond the (possibly unconscious) use of function words and other very common words

Table 3 Delta distances between *A Wonderful Prognostication* and *Two Dangerous Comets*, and representative well-attributed, sole-authored prose works by Greene, Lyly, Munday and Nashe, using the top 250 most frequent words (excluding personal pronouns), with a hold-out text for cross-validation.

Hold-out Text	Delta distance from ***Two Dangerous Comets***				Delta distance from ***A Wonderful Prognostication***			
	Greene	Lyly	Munday	Nashe	Greene	Lyly	Munday	Nashe
–	327.68	350.15	342.84	288.59	312.36	374.38	348.66	301.49
1 Cony-catching	329.05	350.71	343.72	288.93	313.73	374.45	349.54	301.56
2 Cony-catching	329.71	350.69	343.06	289.23	313.32	374.75	348.71	301.74
3 Cony-catching	332.22	352.24	346.22	290.94	314.67	378.07	353.25	304.85
The Anatomy of Absurdity	329.58	351.06	344.58	297.04	313.17	376.63	349.78	304.75
Arbasto	327.39	351.90	343.77	289.03	311.32	375.71	348.49	301.54
The Black Book's Messenger	329.92	351.76	344.94	290.51	314.27	376.64	350.59	303.62
A Brief Answer	328.47	350.88	342.77	289.33	313.38	375.55	349.08	302.16
Christ's Tears over Jerusalem	326.92	349.92	342.41	284.34	311.54	373.75	347.62	300.64
Ciceronis Amor	325.25	348.16	340.82	287.03	310.74	372.34	346.46	299.48
A Courtly Controversy	330.34	353.86	349.92	290.67	315.17	378.45	352.32	303.60
A Disputation	326.52	348.83	341.52	287.24	311.12	372.82	347.08	299.99
The English Roman Life	329.34	352.08	346.84	290.34	314.59	377.05	352.19	304.23
Euphues and His England	328.40	360.88	343.74	289.36	313.33	362.51	349.75	302.18

(Continues)

Table 3 (Continued)

Hold-out Text	Delta distance from ***Two Dangerous Comets***				Delta distance from ***A Wonderful Prognostication***			
	Greene	Lyly	Munday	Nashe	Greene	Lyly	Munday	Nashe
Euphues, the Anatomy of Wit	328.34	363.16	343.78	289.10	312.95	408.37	349.80	301.86
Farewell to Folly	325.94	347.63	340.44	286.58	311.50	371.57	346.02	299.39
Have with You to Saffron Walden	326.29	349.12	341.23	286.98	310.56	372.24	346.53	298.55
Lenten Stuff	326.40	348.95	341.24	287.87	310.62	372.82	346.79	302.24
Menaphon	326.55	348.37	341.06	287.19	310.80	372.47	346.59	299.96
Mourning Garment	325.48	349.29	341.66	287.55	311.83	373.26	348.01	300.47
Never Too Late	325.36	347.85	340.45	286.54	310.04	371.75	346.17	299.33
Orpharion	324.90	347.90	340.72	287.05	310.05	372.31	346.48	299.94
Pandosto	326.35	350.40	342.86	288.25	311.65	374.41	348.58	301.21
Penelope's Web	326.46	348.50	341.16	287.23	310.87	372.73	346.92	299.94
Perimedes the Blacksmith	326.13	348.55	340.96	287.19	311.00	372.53	346.68	299.72
Philomela	325.16	349.06	341.55	287.33	311.11	373.15	347.27	300.41
Pierce Penniless	325.70	347.96	340.78	289.46	310.03	371.58	345.86	299.72
Planetomachia	325.87	348.49	340.90	286.84	311.50	372.37	346.62	299.81
Preface to *Menaphon*	332.26	353.94	347.07	295.48	315.74	378.44	352.18	307.42
A Quip for an Upstart Courtier	329.61	348.44	341.48	287.24	314.12	372.58	347.23	300.29

(Continues)

Table 3 (Continued)

Hold-out Text	Delta distance from ***Two Dangerous Comets***				Delta distance from ***A Wonderful Prognostication***			
	Greene	Lyly	Munday	Nashe	Greene	Lyly	Munday	Nashe
Strange News	326.30	349.10	341.60	287.89	311.28	373.11	347.11	299.91
The Terrors of the Night	327.74	351.05	342.56	293.18	311.94	373.57	347.57	302.18
The Unfortunate Traveler	325.73	348.13	340.77	284.32	310.42	371.97	346.53	298.17
Vision	327.68	350.15	342.84	288.59	311.26	372.23	346.50	299.73
A Watchword to England	328.18	350.83	349.95	289.14	312.61	373.96	359.30	301.70
Zelauto	328.60	352.20	350.36	289.54	312.87	376.39	352.06	302.20

Lowest Delta distance in each run shaded.

to include less frequent but 'strategically chosen lexical words'.[103] To consider these less frequent (but no less characteristic) words, we use a machine learning method called Random Forests,[104] a classification technique for bioinformatics that has since found success in stylometric analysis and authorship attribution testing.[105] Random Forests begins by constructing binary decision trees (i.e. a series of Yes/No decisions leading to further decisions or a predicted classification), each derived from different—and random—samples of the data. Hundreds of such trees are constructed (hence 'Forests'), with each tree contributing a single 'vote' to the outcome classification by majority. Roughly a third of the data is withheld from this 'training' procedure to test the predictive power of the decision trees and to calculate an expected error rate when classifying new, unseen data. By design, this process mitigates against the problem of 'over-fitting' the classifiers to the training data and the need for cross-validation.

Following the same process of feature selection and counting as before, we generate proportion counts for the next 250 most frequent words in the mock-prognostications and texts by Greene and Nashe. These new features are not as ubiquitous as the top 250 most frequent words analysed above nor uncommon enough to be exclusive to one author or another and, unlike the top 250 most frequent words, the vast majority are lexical (e.g. words such as *blood*, *counsel*, *doctor*, *gold* and *melancholy*). The resulting table, with 30 rows (one for each text) and 250 columns (one for each of these words),[106] is imported into R, a software environment for statistical computing.[107] We then use the 'randomForest' package to train 20 forests of 500 decision trees on the texts of Greene and Nashe with which to classify *Two Dangerous Comets* and *A Wonderful Prognostication*.[108] In the first run, Random Forests trains 500 trees which correctly classify 26 out of the 28 texts of known authorship during the training process, giving an expected error rate of 7.14%, before assigning

[103] Hugh Craig and Arthur F. Kinney, 'Methods', in Hugh Craig and Arthur F. Kinney (eds), *Shakespeare and the Mystery of Authorship* (Cambridge: Cambridge University Press, 2009), 15–39 (25).

[104] Leo Breiman, 'Random Forests', *Machine Learning*, 45.1 (2001), 5–32; see also David S. Siroky, 'Navigating Random Forests and Related Advances in Algorithmic Modeling', *Statistics Surveys*, 3 (2009), 147–63.

[105] Representative examples include Mingzhe Jin and Masakatsu Murakami, 'Authorship Identification Using Random Forests', *Proceedings of the Institute of Statistical Mathematics*, 55.2 (2007), 255–68; Tomoji Tabata, 'Stylometry of Dickens's Language: An Experiment with Random Forests', in Paul Longley Arthur and Katherine Bode (eds.), *Advancing Digital Humanities: Research, Methods, Theories* (New York: Palgrave, 2014), 28–53; and Jack Elliott and Brett Greatley-Hirsch, '*Arden of Faversham*, Shakespearean Authorship, and "the print of many"', in Gary Taylor and Gabriel Egan (eds.), *The New Oxford Shakespeare: Authorship Companion* (Oxford: Oxford University Press, 2017), 139–81.

[106] This table, in CSV format, is available to download from https://github.com/JackWilton1594/RS-Nashe.

[107] R Foundation for Statistical Computing, *R: A Language and Environment for Statistical Computing*, version 4.2.1, 2022, https://www.r-project.org/.

[108] Andy Liaw and Matthew Wiener, 'Classification and Regression by randomForest', *R News*, 2.3 (2002), 18–22.

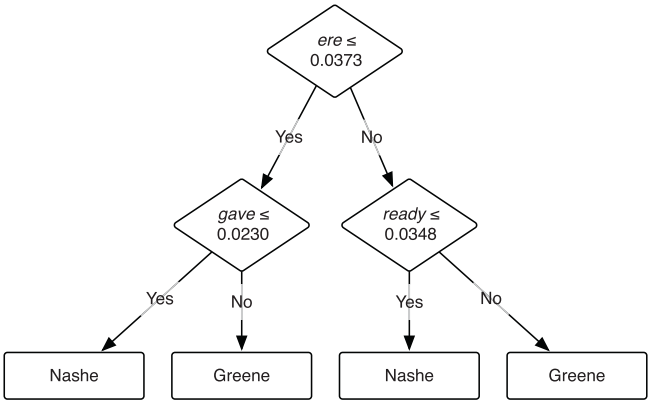

Fig. 4 Sample Random Forests decision tree for classifying *Two Dangerous Comets* and *A Wonderful Prognostication* between Greene and Nashe using the second 250 most frequent words (excluding personal pronouns)

both *Two Dangerous Comets* and *A Wonderful Prognostication* to Nashe. For illustrative purposes, Fig. 4 gives an example of a single decision tree generated during this run: if a text contains the word *ere* with a proportion equal to or greater than 0.0373 and a proportion of *gave* greater than or equal to 0.0230 *or* a proportion of *ready* greater than or equal to 0.0348, then the tree votes for Nashe as the author, and so on.

Table 4 summarizes the results of the 20 runs, giving the number of variables tried at each 'split' by the 500 decision trees, the expected error rates (as a percentage of misclassification), predicted classifications of the Greene and Nashe texts and the outcome classifications of *Two Dangerous Comets* and *A Wonderful Prognostication*. The Random Forests algorithm consistently classifies *A Wonderful Prognostication* as a Nashe text, while attributing *Two Dangerous Comets* to Nashe in all but 4 of the 20 runs (i.e. 80% of the time). Although none of the training classifications is perfect, the expected error rates are relatively low, with a maximum of three training misclassifications in any given run: the forests frequently misclassify *The Anatomy of Absurdity* (all runs) and the Preface to *Menaphon* (all except for runs 3, 11, 14, 17 and 20), and infrequently misclassify *The Unfortunate Traveler* (runs 6, 7, 13 and 18) and *3 Cony-catching* (run 2). Further investigation into these texts may reveal reasons for their repeated misclassification, but such speculation is outside the scope of the present study. That the forests are evidently more likely to misclassify Nashe texts should allow us to place more certainty in those Nashe classifications that remain. Bearing in mind that every run generates 500 decision trees, each using a random and different sample of the data, the relatively high level of consistency and accuracy in these findings independently confirms the greater likelihood that Nashe authored both mock-prognostications.

Table 4 Results of 20 Random Forests classifications of *Two Dangerous Comets* and *A Wonderful Prognostication* between Greene and Nashe using the second 250 most frequent words (excluding personal pronouns).

Run	Splits	Misclassification	Predicted/Actual		***Comets***	***Wonderful***
			Greene	Nashe		
1	8	7.14%	19/19	7/9	Nashe	Nashe
2	30	10.71%	18/19	7/9	Nashe	Nashe
3	8	3.57%	19/19	8/9	Nashe	Nashe
4	15	7.14%	19/19	7/9	Nashe	Nashe
5	8	7.14%	19/19	7/9	Nashe	Nashe
6	30	10.71%	19/19	6/9	Greene	Nashe
7	8	10.71%	19/19	6/9	Nashe	Nashe
8	15	7.14%	19/19	7/9	Greene	Nashe
9	8	7.14%	19/19	7/9	Nashe	Nashe
10	30	7.14%	19/19	7/9	Nashe	Nashe
11	8	3.57%	19/19	8/9	Nashe	Nashe
12	15	7.14%	19/19	7/9	Greene	Nashe
13	30	10.71%	19/19	6/9	Nashe	Nashe
14	4	3.57%	19/19	8/9	Nashe	Nashe
15	8	7.14%	19/19	7/9	Nashe	Nashe
16	8	7.14%	19/19	7/9	Nashe	Nashe
17	8	3.57%	19/19	8/9	Nashe	Nashe
18	60	10.71%	19/19	6/9	Greene	Nashe
19	30	7.14%	19/19	7/9	Nashe	Nashe
20	8	3.57%	19/19	8/9	Nashe	Nashe

CONCLUSION

With the exception of George Steevens, whose remarks have seemingly gone unnoticed, scholars have not seriously entertained the possibility that Foulweather and Smellknave are one and the same person. Rather than a satirical partnership, collaboration, or rivalry using a popular form, we are left with Nashe writing on his own, playing with form and his own authorial identity as well as establishing relationships with different publishers. Without the third pamphlet by Fairweather, it is impossible to know whether he authored a trilogy of mock-prognostications in 1591 under three separate pseudonyms, perhaps in further mockery of the three Harvey brothers. Attributing both *A Wonderful Prognostication* and *Two Dangerous Comets* to a single author in Nashe also alters our framework for interpreting them both: rather than seeing *Two Dangerous Comets* as a conscious response to *A Wonderful Prognostication*, it shows the same

author extending and 'riffing' on the same ideas and tropes. The assumption of the long-standing critical tradition that at least two separate authors worked together or in tandem with one another on these mock-prognostications inevitably meant that we were looking for a second author. The realisation that Nashe is the most likely author of both (and, possibly, the lost *Pleasant Prognostication*) not only has implications for Nashe studies, but for studies in authorship. While it is important to be aware of a text's critical history, it can also muddy the waters and so having the willingness to reassess even long-established 'ground truths'—and to discern when it is appropriate to do so—is an important consideration for authorship studies. The personae of Foulweather and Smellknave mark important but hitherto unacknowledged evolutions of Nashe as a writer and his place within the literary scene of 1590s London.

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