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Article abstract

In this article, Esther van Raamsdonk and Ruth Ahnert apply social network analysis to show us Milton's influence on seventeenth-century literary, philosophical, and diplomatic networks. Their analysis offers a remarkably clear sense of Milton's direct and indirect influence in England and on the Continent as well as demonstrating ways in which Milton might have been influenced himself by European intellectual, literary, and political culture. In addition to calling attention to the international reach of Milton's work, the authors are able to use a novel method that shows a network around Milton that goes beyond his direct correspondence. As a result, we are given a much more accurate sense of Milton's influence than has previously been available to us.

John Milton's Network and the Republic of Letters¹

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In this article, Esther van Raamsdonk and Ruth Ahnert apply social network analysis to show us Milton's influence on seventeenth-century literary, philosophical, and diplomatic networks. Their analysis offers a remarkably clear sense of Milton's direct and indirect influence in England and on the Continent as well as demonstrating ways in which Milton might have been influenced himself by European intellectual, literary, and political culture. In addition to calling attention to the international reach of Milton's work, the authors are able to use a novel method that shows a network around Milton that goes beyond his direct correspondence. As a result, we are given a much more accurate sense of Milton's influence than has previously been available to us.

Dans cet article, Esther van Raamsdonk et Ruth Ahnert ont recours aux méthodes de l'analyse des réseaux sociaux pour mettre en lumière l'influence de Milton sur les réseaux littéraires, philosophiques et diplomatiques du XVII^e siècle. Leur analyse donne une idée remarquablement claire de l'influence directe et indirecte que Milton a exercée en Angleterre et sur le continent ; elle montre également comment Milton a pu lui-même être influencé par la culture intellectuelle, littéraire et politique européenne. En plus d'attirer l'attention sur la portée internationale de l'œuvre de Milton, les autrices mettent à contribution une méthode novatrice qui révèle un réseau autour de Milton s'étendant bien au-delà de la correspondance que celui-ci entretenait. En conséquence, cet article nous donne une idée beaucoup plus précise de l'influence de Milton que celle dont nous disposons jusqu'à présent.

In late 1655, John Milton composed two sonnets to Cyriack Skinner: “Sonnet XVIII” and “To Mr Cyriack Skinner Upon his Blindness.” Skinner had been tutored by Milton in the mid-1640s, and over the following decade would live close to his old tutor and regularly visit, as recalled by Milton's nephew Edward Philips. Andrew Marvell wrote in a letter to Milton on 2 June 1654 that he was “exceeding glad to thinke that Mr Skyner is got near you, the Happinesse which

1. This research was generously funded by the Arts and Humanities Research Council as part of the grant Networking Archives: Assembling and Analysing Early Modern Correspondence, and by a British Academy Postdoctoral Fellowship. Many thanks to Sebastian E. Ahnert, Yann Ryan, and Miranda Lewis for their help with the metadata, visualizations, and coding. We are very grateful to Jason A. Kerr and Timothy T aylor for their comments and contributions to this chapter, including Kerr's discovery of some missing Milton letters.

I at the same Time congratulate to him and envie.”² Shortly before composing the two sonnets to Skinner, Milton wrote “Sonnet XVII” to Edward Lawrence, son of Henry Lawrence, who was appointed lord president of the Council of State on 16 December 1653.³ Edward Lawrence also often visited Milton in his house in Petty France and they shared an acquaintance in Henry Oldenburg. Milton and Oldenburg had entered a correspondence in 1654, and Milton introduced him to another acquaintance, Katherine Jones, Lady Ranelagh, whom he had known since the mid-1640s.⁴ Lady Ranelagh would offer the tutelage of her son Richard Jones to Oldenburg, succeeding Milton in this role in 1656.⁵ Gordon Campbell and Thomas Corns describe this circle, which includes “a poet, a European intellectual, an aristocratic lady, and at least one pupil, [...] in miniature a representative grouping of Milton’s friends.”⁶

If this is Milton’s network in miniature, a natural question would be what Milton’s network looks like in full. This article demonstrates some analytical techniques for contextualizing the full body of extant letters to and from the poet within a broader epistolary network. By situating Milton within a universe of contemporary correspondence, we are able to gain insights into his position within flows of epistolary exchange; to see those communities with whom he was closely aligned, and those from which he remained distant; and to discover those figures with whom he shared correspondents, although he did not write to them directly. Such insights are possible for the first time due to two developments: the increasing availability of digitized correspondence, and the application of theories and methods from the fields of social network analysis and network science. We can now see which networks intersect with Milton’s, how important the contact of Oldenburg is for Milton’s network, and how

2. Andrew Marvell, “For my most honoured Freind John Milton Esquire, Secretarye for the forraine affairs. At his house in Petty France Westminster,” in *The Poems and Letters of Andrew Marvell. Volume II: Letters*, ed. H. M. Margoliouth (Oxford: Clarendon Press, 1927), 292–93, letter 2 of miscellaneous letters.

3. Gordon Campbell and Thomas Corns, *John Milton: Life, Works and Thought* (Oxford: Oxford University Press, 2008), 265–66.

4. Campbell and Corns, 267.

5. Gordon Campbell, *A Milton Chronology* (Basingstoke: Palgrave Macmillan, 1997), 167, dx.doi.org/10.1057/9780230371866; Estelle Haan, ed., intro., and trans., *John Milton: Epistolarum Familiarium Liber Unus and Uncollected Letters* (Leuven: Leuven University Press, 2019), 17, dx.doi.org/10.11116/9789461662958.

6. Campbell and Corns, 267.

centrally placed Milton actually is within the Republic of Letters. We observe that in fact Milton's network intersected with two communities—the Hartlib Circle and a group of Dutch scholars—but he remained marginal to both, partly due to his heterodoxy. These findings are important not only for the way they enrich our picture of Milton's position within the wider intellectual network of the early modern world; they also make a compelling case for the need for further digitization of early modern letters and the expansion of what we might call a “meta-archive”—an online repository for depositing and linking collections of correspondence. Such a venture allows us to more systematically piece together the social and intellectual connections of our past, and to move beyond siloed analyses of individuals.

Epistolary networks

The application of network analysis to epistolary sources has been seized upon in recent years as a means of harnessing the latent power of letters to reveal insights about social worlds, and of managing and disseminating information over time and space. Methods of network visualization and quantitative network analysis have found particular favour with early modernists and the scholarly community, due not least to the increasing number of early modern correspondence databases and projects: Early Modern Letters Online (emlo.bodleian.ox.ac.uk/home), Electronic Enlightenment (e-enlightenment.com/), ePistolarium (ckcc.huygens.knaw.nl/epistolarium/), and SKILLNET (Sharing Knowledge in Learned and Literary Networks: The Republic of Letters as a Pan-European Knowledge Society, skillnet.nl), as well as those developed for sale to libraries, such as State Papers Online (gale.com/intl/primary-sources/state-papers-online). The availability of such data at scale has meant that rather than piece together exchanges letter by letter, it is now possible to marshal large bodies of correspondence connected to a single person or community, and to visualize it using numerous off-the-shelf network analysis tools. Such tools allow users to generate the now ubiquitous hairball diagrams, as well as cartographic projections.⁷

7. For an overview of the various tools available, see The Historical Network Research Community, accessed 7 February 2020, historicalnetworkresearch.org/resources/external-resources/.

The map view is now most readily associated with the Stanford University project Mapping the Republic of Letters, which leveraged data from the Electronic Enlightenment. It has rendered insights into where America features in the Republic of Letters, and more focused studies on the shape of the correspondence networks of Benjamin Franklin and John Locke.⁸ But network analysis is not simply about the visual rendering of relationships. As the work of Ruth Ahnert and Sebastian E. Ahnert has shown, the quantitative methods and algorithms that have been developed in the field of network science provide other ways of extracting insights about the organization of social networks, and the transfer of information. For example, their work on the 132,747 unique letters in the State Papers dating from the period between Henry VIII's accession and the death of Elizabeth I developed a tailored method to make predictions about people likely to be trading in conspiracies or illicit intelligence.⁹ These kinds of approaches have begun to be employed to illuminate communities connected to Milton's, such as Evan Bourke's work on women in the Hartlib Circle, which challenges the view that it was focused on a group of male friends, arguing that Dorothy Moore Dury and Viscountess Ranelagh need to be recognized as integral elements at this network's core.¹⁰ Ranelagh, of course, was also part of Milton's miniature network, sketched above. A more direct focus on Milton is found in an article by Blaine Greteman, which combines Milton's correspondence with other textual relationships, incorporating such diverse markers as "a letter sent, a book published, printed or sold, a dedication or name in the rich paratextual material that accompanied so many early modern works."¹¹ This combination of sources leads to much richer data on Milton

8. See Caroline Winterer, "Where is America in the Republic of Letters?," *Modern Intellectual History* 9.3 (2012): 597–623, [dx.doi.org/10.1017/S1479244312000212](https://doi.org/10.1017/S1479244312000212); "The Correspondence Network of Benjamin Franklin: The London Decades," Mapping the Republic of Letters, accessed 7 February 2020, republicofletters.stanford.edu/publications/franklin/; and "John Locke's Letters," Mapping the Republic of Letters, accessed 7 February 2020, republicofletters.stanford.edu/publications/locke/.

9. Ruth Ahnert and Sebastian E. Ahnert, "Metadata, Surveillance, and the Tudor State," *History Workshop Journal* 87 (2019): 27–51, [dx.doi.org/10.1093/hwj/dby033](https://doi.org/10.1093/hwj/dby033).

10. Evan Bourke, "Female Involvement, Membership, and Centrality: A Social Network Analysis of the Hartlib Circle," *Literature Compass* 14 (2017): 1–17, [dx.doi.org/10.1111/lic3.12388](https://doi.org/10.1111/lic3.12388).

11. Blaine Greteman, "Milton and the Early Modern Social Network: The Case of the *Epitaphium Damonis*," *Milton Quarterly* 49.2 (2015): 79–95, 80, [dx.doi.org/10.1111/milt.12126](https://doi.org/10.1111/milt.12126). By comparison, the application of networks in Peter C. Herman's chapter, "'Still Paying, Still to Owe': Credit, Community, and Small Data in Shakespeare and Milton," in *Digital Milton*, ed. David Currell and Islam Issa

than focusing solely on his letters, but the trade-off here is that the flattening of different types and depths of interaction renders it difficult to define and evaluate connections between two people.

Despite the emergent body of work in this area, much of the literature on early modern correspondence networks speaks in the future tense: not of what has been done, but of what could be done, or should be done in light of the simultaneous availability of plentiful data and powerful quantitative methods. This is due in part to the unique problem of working with letters: they are, by design, a technology of dispersal. Therefore, while the term “the Republic of Letters” conjures an imagined community connected by epistles—textual and intellectual exchange—the manuscript and print evidence for those connections is necessarily scattered in numerous archives. As Howard Hotson and Thomas Wallnig have observed: “[re]assembling the scattered letters, even of a single famous individual, remains an extremely laborious process, sometimes requiring lifelong labours of whole teams of scholars.”¹² However, thanks to a COST Action, Hotson and Wallnig were able to organize a large international network of scholars to propose a set of shared standards and systems, so that independently created and hosted data silos can in principle be reunited as a single pool of homogeneous data.¹³ The implementation of such standards and systems is the precondition of undertaking the kind of analysis below, but it has only just begun. In this instance, at the Networking Archives project, we are using a version of Early Modern Letters Online (hereafter EMLO) as a contextual meta-archive, which at the time of extraction had 151,835 letters for the period between 1508 and 1829, mostly focusing on correspondence that might broadly be defined as constitutive of the Republic of Letters.¹⁴

(Basingstoke: Palgrave Macmillan, 2018), 153–77, [dx.doi.org/10.1007/978-3-319-90478-8_7](https://doi.org/10.1007/978-3-319-90478-8_7), is much more analogue and limited in the insights it enables.

12. Howard Hotson and Thomas Wallnig, eds., *Reassembling the Republic of Letters in the Digital Age: Standards, Systems, Scholarship* (Göttingen: Göttingen University Press, 2019), 9, [dx.doi.org/10.17875/gup2019-1146](https://doi.org/10.17875/gup2019-1146).

13. See Hotson and Wallnig, eds., *Reassembling the Republic of Letters*.

14. However, EMLO is undergoing a major development undertaken by the Networking Archives project, which will integrate metadata for correspondence in the Tudor and Stuart State Papers (The National Archives, Kew), expanding the meta-archive to ca. 450,000 letters.

Milton's letter network

Milton's epistolary network is relatively small, being made up of forty outgoing and thirty-six incoming surviving letters; it is also a dataset with some particular challenges for analysis, as will be explored below. Several editions of Milton's letters have been published. The first, crucially, was published by Milton himself, entitled *Epistolae Familiares*.¹⁵ The edition contains thirty-one letters, all in Latin and all sent by Milton; he did not see fit to include any replies or letters received. Given that the collection was bound together with his *Prolusiones* (College Exercises), it is reasonable to assume that demonstrating his characteristic and well-regarded skill in Latin was a significant factor in making his selection.¹⁶

Several scholarly collections have edited and added to this self-publication; most recently, Estelle Haan has completed *John Milton: Epistolarum Familiarium Liber Unus and Uncollected Letters*.¹⁷ This contains the original thirty-one letters from Milton's edition, six more letters to Hermann Mylius, three vernacular letters, and twenty-one more letters in Latin sent to Milton, totalling sixty-one. An interesting contribution is that several of the dated letters in Milton's edition had been misdated and therefore misplaced within his chronologically ordered edition; based on contemporary events mentioned in the text, Haan has been able to reconstruct the true order of composition. The analysis in this article is therefore based mainly on Haan's edited work, which is more extensive and likely more accurate in some respects than Milton's own.¹⁸ In addition to Haan's edition, four letters (of which two are no longer extant) from Oldenburg to Milton, all written in the years from 1654 to 1657 and transcribed or listed in the

15. Campbell and Corns, 370.

16. As Jason A. Kerr has pointed out (private correspondence), the *Prolusiones* were a last-minute addition, as initially some of Milton's State Papers would be part of the edition. These are in Latin, too, and are in, as Leo Miller and Robert Fallon have shown, characteristic Miltonic Latin, which again suggests that Milton's felicity with the language was to be displayed. Leo Miller, *John Milton and the Anglo-Dutch Negotiations, 1651-1654* (Pittsburgh: Duquesne University Press, 1992), and Robert Fallon, *Milton in Government* (University Park, PA: Penn State University Press, 1993).

17. See note 5, above.

18. The metadata of Haan's edition is now part of EMLO: emloportal.bodleian.ox.ac.uk/collections/?catalogue=john-milton.

Hall edition, are taken into account in our analysis.¹⁹ Two letters from Charles Diodati in Ancient Greek to Milton and two letters in Italian from Carlo Dati to Milton are taken from the Colombia edition of *The Works of John Milton*.²⁰ Five letters in English to Milton are taken from the Yale edition of the *Complete Prose Works of John Milton*.²¹ The transcript and photo of a recently discovered letter in English from Octavian Pulleyn, the elder, to Milton is printed in Hilton Kelliher's article.²² Lastly, a letter from Andrew Marvell to Milton dated 2 June 1654 from the H. M. Margoliouth edition is also added, leading to a total of seventy-six letters.²³

Alongside these personal and intellectual letters, there is an additional but not unproblematic resource, namely Milton's professional correspondence in the service of government. One such is his letter to John Bradshaw (21 February 1653), which includes his recommendation of Andrew Marvell for a position. The letter is now kept in the State Papers in the National Archives in Kew, and has also been incorporated into Haan's edition, and consequently this dataset. Robert Fallon has furthermore identified a large number of other letters, papers, and missives—some 170 in total—that may be attributed to Milton, catalogued in his book *Milton in Government*. Some of these attributions are well established, while others are revealed by fresh scholarly attention. The letters in this group had some degree of contribution from Milton; for example, they may have been written on behalf of the Council of State, Parliament, or Cromwell in Milton's capacity as Secretary for Foreign Tongues. Milton would have been involved at some point with the translation, composition, or administration of these letters. However, as Fallon writes, "there is no direct, tangible evidence that Milton composed any of the letters attributed to him."²⁴ Therefore, while we can be reasonably assured that he had a hand in their creation based on

19. Henry Oldenburg, *The Correspondence of Henry Oldenburg*, ed. and trans. A. Rubert Hall and Marie Boas Hall, 3 vols. (Madison: University of Wisconsin Press, 1965), 1:1641–62.

20. F. A. Patterson, ed., *The Works of John Milton* (New York: Columbia University Press, 1936), vol. 12.

21. Don M. Wolfe, ed., *Complete Prose Works of John Milton* (New Haven and London: Yale University Press, 1966), vol. 4, part 2; Robert W. Ayers, ed., *Complete Prose Works of John Milton* (New Haven and London: Yale University Press, 1966), vol. 7.

22. Hilton Kelliher, "Foreign Piracies of the *First Defence*: A New Letter to Milton," *Milton Quarterly* 52.2 (2018): 81–94, dx.doi.org/10.1111/milt.12260.

23. Marvell, 292–93, letter 2 of miscellaneous letters.

24. Fallon, 9.

the presence of his distinctive Latin, these letters have been excluded from our analysis because they are not illustrative of Milton's epistolary contacts, but only demonstrate administrative labour in support of others' communications.

The resulting body of seventy-six letters allows us to derive some basic network metrics. Although network analysis is not strictly necessary to compute this small-scale data set, the metrics are important to introduce here as we will be building on them, below, in ways that do require computation.

Table 1. Glossary of terms²⁵

Nodes	The entities in a network; in this case these are the correspondents.
Edges	The connections between those entities, which in this case are connections marked by letters.
Total Degree	The total number of a given node's edges. Here the degree is calculated as the total of the in-degree and out-degree.
In-degree	The total number of people who wrote to a given person.
Out-degree	The total number of people to whom a given person wrote.
Total Strength	The total number of letters sent and received by a given person.
In-strength	The total number of letters received by a given person.
Out-strength	The total number of letters sent by a given person.
Betweenness	A measure of a node's infrastructural importance. For any two nodes in a network, there is a shortest path between them, and betweenness tells us how many of these shortest paths go through a given node. Both communication hubs and "bridges" can have high betweenness.
Eigenvector centrality	A measure of a node's proximity to power.

Milton's seventy-six letters give us a network made up of twenty-seven *nodes* (including Milton), and twenty-six *edges*, spanning the period from 1625 to 1667. His *out-degree* is twenty, and his *in-degree* is twelve, with a *total-degree* of thirty-two. His *in-strength* is thirty-eight and his *out-strength* thirty-eight. We can represent this information as a simple directed network, as demonstrated in Figure 1.

25. This glossary is developed from Ahnert and Ahnert, "Metadata," 30–31.

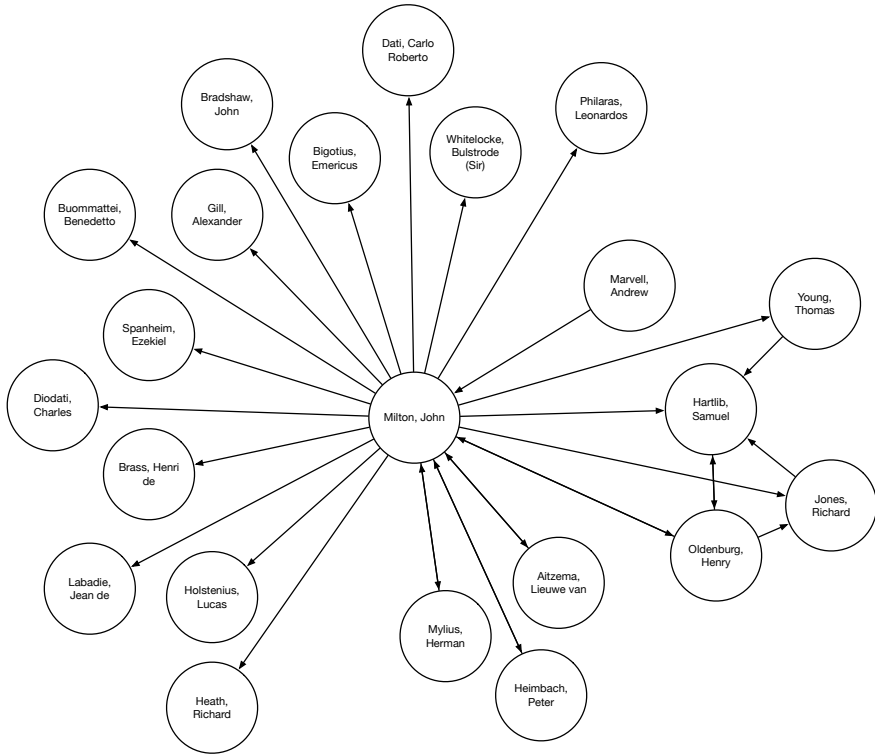


Figure 1. Milton's network with directed edges.

As a group, these twenty-seven nodes, or persons, display considerable variety in social and geographic terms. Letters reached as far as Florence, Athens, Saumur, Geneva, and Amsterdam, alongside more local messages to London and Edinburgh. The same international outlook is manifest in the prevalence of Latin in these letters: thirty-seven of Milton's letters are in Latin, as are twenty-five of those received. Some of Milton's correspondents were contacts from Milton's Grand Tour to Italy (as well as, briefly, to France and Geneva) in the years 1638 and 1639, such as Benedetto Buonmattei and Carlo Dati, both of whom Milton would praise later for their generous welcome in his *Defensio Secunda*.²⁶ The former was a priest and shared with Milton an academic interest in the grammatical importance of the Tuscan tongue, as is testified by their

26. Campbell and Corns, 109; Milton, *Complete Prose Works*, 4:615–16.

letter of 10 September 1638, which concerns this scholarly matter. They most likely met at one of the literary academies of Florence, and they maintained contact thereafter.²⁷ At the same time, Milton became acquainted with Dati, another Florentine academic, who was often described as the “literary prodigy of Florence” and would have had much in common with Milton.²⁸

Contact with other correspondents was initiated through Milton’s work as Secretary for Foreign Tongues (1649–53). One example is Hermann Mylius (1603–57), a fascinating figure who worked as a German diplomat, sent to England on behalf of the Count of Oldenburg to negotiate a travel safeguard across the English territories.²⁹ Milton would play a role in the translation of this safeguard documentation and was visited regularly by Mylius, recorded in the latter’s diary.³⁰ The exchanges between the two men provide by far the most extensive correspondence vector still extant, some twenty-three letters. Another diary keeper whose connection with Milton was prompted by political activity is Lieuwe van Aitzema (1600–69). Aitzema was a diplomat for the Hanseatic cities and had undertaken a mission to England in 1653, where the two men met.³¹ During Aitzema’s time in London, Milton became involved with the Anglo-Dutch negotiations and translated several documents in Latin for him. Aitzema would in turn play a role in translating Milton’s *The Doctrine and Discipline of Divorce* into Dutch. Milton’s letter to Aitzema of 1655 shows some displeasure about this translation, largely because of the author’s unease about making the arguments available in the common language instead of the Latin of learned debate. Despite the greater renown that might be accrued by a wider reading audience, Milton had reservations about sharing his tract beyond an intellectual elite. The circle of friends mentioned in our introduction highlights connections also made through Milton’s tutelage of various young men, such as Richard Jones and Cyriack Skinner. This, in turn, produced links to influential figures such as Henry Oldenburg. In short, Milton’s circle of acquaintances

27. Haan, 116; see also, Nicholas McDowell, *Poet of Revolution: The Making of John Milton* (Princeton: Princeton University Press, 2020), 340–44, [dx.doi.org/10.2307/j.ctv10kmfkr](https://doi.org/10.2307/j.ctv10kmfkr).

28. Campbell and Corns, 113; Haan, 164.

29. Nicholas von Maltzahn, “Mylius, Hermann (1603–1657), diplomat,” *Oxford Dictionary of National Biography*, 23 September 2004, oxforddnb.com/view/10.1093/ref:odnb/9780198614128.001.0001/odnb-9780198614128-e-68375.

30. Leo Miller, *John Milton and the Oldenburg Safeguard* (New York: Loewenthal Press, 1985), *passim*.

31. Leo Miller, *John Milton and the Anglo-Dutch Negotiations*, 6–7.

encompassed European diplomats, fellows of the Royal Society of London, European intellectuals in several countries, childhood friends, former pupils, and literary figures.

The network we can construct from Milton's existing letters might be described as a kind of ego network in that it is focused around one central node. But it is not a true ego network by the definition used in social network analysis. In that context, an ego network is one that consists of a focal node ("ego") and the nodes to whom the ego is directly connected (called "alters"), plus the edges of connections among the alters, where available.³² Of course, the networks that can be derived from standard edited collections of correspondence contain the minimum data because we usually lack those connections or edges between the alters. Without those additional connections there are very few quantitative network measures that can be derived. All we can really count, as already demonstrated above, are the node's in- and out-degree, and total degree, alongside in- and out-strength and total strength. In order to render new insights about Milton's network, we need to supply those cross-cutting edges so that we might understand which of his correspondents also corresponded with one another. Previously, to supply this additional information would have taken extensive labour. However, it is now possible to contextualize Milton's network within an existing body of correspondence, which allows us not only to supply some of these alters but also to examine the larger universe of exchange within which Milton was situated.

We are examining Milton within the context of Early Modern Letters Online (EMLO), a database that is a partial, yet still extensive, representation of the Republic of Letters. Built up incrementally over the past decade, EMLO includes key figures associated with the Republic of Letters, such as Joseph Justus Scaliger, Gerardus Joannes Vossius, Marin Mersenne, Samuel Hartlib, and letters by members of the Royal Society.³³ The dataset version employed here consists of 21,228 people, and 151,769 letters.³⁴ While large, however,

32. For further reading on ego networks, see Nick Crossley, Elisa Bellotti, Gemma Edwards, Martin G. Everett, Johan Koskinen, and Mark Tranmer, *Social Network Analysis for Ego-Nets* (London: Sage Publications, 2015), [dx.doi.org/10.4135/9781473911871](https://doi.org/10.4135/9781473911871).

33. The complete letters to and from Milton have only recently been added to EMLO's catalogue, see emlo-portal.bodleian.ox.ac.uk/collections/?catalogue=john-milton.

34. This is based on extracted EMLO data from February 2019 (with a later addition of Milton's letters).

it is important to remember that EMLO is an artificially-shaped dataset, determined by key priorities (such as the digitization of a card catalogue describing a selection of collections in the care of Oxford's Bodleian Libraries) and the availability of data generously shared by more than a hundred separate contributors and their scholarly editions.³⁵ Despite these unavoidable biases and absences, however, there are several reasons to use the EMLO archive as our contextualizing dataset. First, of the twenty-six people with whom Milton exchanged letters, sixteen are already in EMLO in some capacity (61.5 percent). This means that we can also probe the context of those people who are in EMLO twice removed from Milton (or even further beyond) and who are indirectly part of his network through shared acquaintance.

Second, although Milton's correspondence spans the years 1625 to 1667, the substantial majority of his letters (75 percent) were sent in the 1650s.³⁶ EMLO's dataset is at its most extensive for the period between 1640 and 1660, as can be seen in Figure 2. It also provides the strongest contextual frame for Milton's most prolific and prominent period of correspondence. If we narrow our focus in EMLO's database to match the context of Milton's correspondence more closely, namely setting a roughly forty-year period of 1625 and 1667, the correspondence of 7,523 people remains, which is a significant contextualizing dataset.

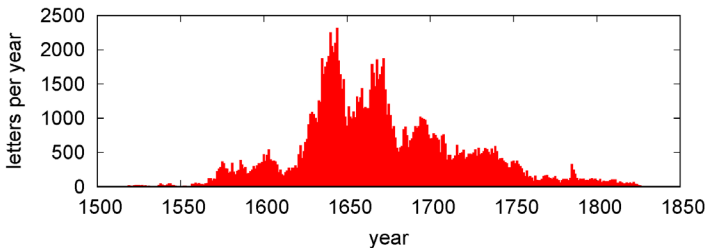


Figure 2. EMLO distributed by years.

35. For a list of contributors of metadata to EMLO, see emlo-portal.bodleian.ox.ac.uk/collections/?page_id=2259.

36. 1620s (five letters); 1630s (nine letters); 1640s (three letters); 1650s (fifty-seven letters); 1660s (two letters).

Third, as a result of EMLO's stringent editorial policies, the data is relatively clean. Significant efforts have been made to ensure correct identification of senders, recipients, and, in some cases, people mentioned, across the multiple correspondences, through disambiguation, deduplication, and the addition of linked data. Systems are in place also to secure consistency of dates and calendars, and the disambiguation and geo-location of place names. The data is, in some cases, based on authoritative edited collections, which means that there is a wealth of substantiating information about these correspondents. In brief, for the contextualizing of Milton's network, EMLO is well-suited in terms of size, correspondence focus, period strength, and data reliability.

Milton's place in Early Modern Letters Online

The benefits of contextualizing Milton's correspondence in a large meta-archive such as EMLO are threefold. The first and easiest benefit to grasp, and the one that has already been stated, is that it allows us to begin to understand how Milton's correspondents are themselves connected and how they sit more broadly within the Republic of Letters. The second benefit is that it enables us to interpret the kinds of statistics we quoted above; the counts of degree, their strength, and their directed variants are relatively meaningless unless these are compared with the scores for other contemporary correspondents. Only then are we able to rank all twenty-seven people (including Milton) in Milton's network for their scores for any network measure that we apply, or to see where they rank among the 7,523 other people corresponding in this period. The third benefit, which extends from the second, is that several of the network metrics useful to us are what we might describe as "global statistics." As the term suggests, these "global statistics" are measures that need to be run on the entire network, in order to tell us something about the position of the individual node within the context of that whole.³⁷ Two such measures, which we employ below, are "betweenness centrality" and "eigenvector centrality." The full definition of these terms can be found in the glossary above (Table 1), but we will also explain the utility of these methods as we go. We applied eight network

37. On the challenges and possible solutions for generating global statistics on incomplete network data, see Catherine A. Bliss, Christopher M. Danforth, and Peter Sheridan Dodds, "Estimation of Global Network Statistics from Incomplete Data," *PLOS One* 9.10 (2014), e108471, dx.doi.org/10.1371/journal.pone.0108471.

measures to Milton's correspondence within the context of EMLO: degree (in-degree, out-degree, and total-degree), strength (in-strength, out-strength, and total-strength), betweenness centrality, and eigenvector centrality.

For the measures of strength and degree, Milton consistently scores in the top 10 percent of the EMLO archive. For total strength (total amount of correspondence) he ranks 174 out of 7,523 (2.3 percent), for in-degree (total number of people writing to Milton) he ranks 102 (1.4 percent), and for out-degree (number of people to whom he wrote) he ranks 47 (0.6 percent). Ranking in the top 5 percent may suggest that Milton is remarkable, but it is less significant than it might seem initially because of the degree distribution we see over the entire EMLO collection for this period, namely that 69 percent of people have a degree of just one—in other words, they wrote or received a letter from just one person. This makes a lot of sense when we consider the composition of the EMLO meta-archive: it comprises many overlapping ego networks, which results in a very small number of people with a very large number of correspondents, and a very large number of people who appear only because of a single connection to those hubs. However, this distribution should not be interpreted entirely as an artefact of the collection process. This particular distribution, which appears as a diagonal line on a logarithmic set of axes, is in fact a feature of many real-world networks, as observed in an important study by Albert-László Barabási and Réka Albert in 1999, entitled “Emergence of Scaling in Random Networks.”³⁸ The study argued that a wide variety of seemingly heterogenous networks, such as power grids, social networks, and the World Wide Web, exhibit near-identical distributions of connectivity, and it offered an elegant model that explained how these distributions might arise. It is also a distribution that has been observed in other letter archives: Ahnert and Ahnert's study of approximately 130,000 Tudor letters found in the State Papers archive showed the same diagonal lines on logarithmic axes, and showed that 68 percent of the correspondents had a degree of one.³⁹

38. Albert-László Barabási and Réka Albert, “Emergence of Scaling in Random Networks,” *Science* 286.5439 (1999): 509–12, [dx.doi.org/10.1126/science.286.5439.509](https://doi.org/10.1126/science.286.5439.509).

39. Ahnert and Ahnert, “Metadata,” 7.

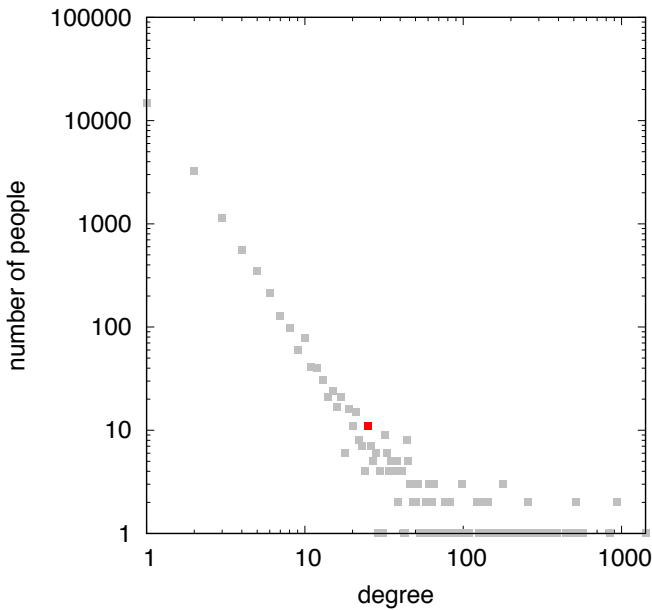


Figure 3. Degree distribution with Milton's position in red.

What this means is that if we cut off the giant fringe of people with a single correspondent, we are left with 1,839 people, leading to Milton's position dropping down to the top 10 percent (8.4 percent on total-strength). This shows us quite clearly that in terms of volume of correspondence and number of connections, Milton is not as remarkable. When we compare Milton with the huge correspondences left by the likes of Gerardus Joannes Vossius or Joseph Justus Scaliger, this will come as no surprise.

Moreover, it seems that a number of his correspondences were only weakly held. In Milton's epistolary archive, with some exceptions such as Mylius, Oldenburg, and Jones, he exchanged only one letter with fourteen people (52 percent of his surviving archive). This is not unusual for letter networks. Since not all connections are equal, we distinguish between strong and weak links. Simply put, edges between nodes can be weighted. Edges are strengthened by repetition, mirroring an established and sustained epistolary relationship. Weak links can be defined as "links between network elements, which connect

them with a low intensity.”⁴⁰ It is worth pointing out briefly here that we rely on written evidence of a contact, but that connections naturally also took place outside of written contact: meeting for a performance in the Globe, exchanging a book in Eton’s library, or bickering about Salmasius in the tavern. In a letter to his friend Charles Diodati of 2 September 1637, Milton describes this other form of contact: “you take frequent breaths in between, you visit friends, you write much, sometimes you make a journey.”⁴¹

How ought we to imagine a network that relies mostly on weak links, as in Milton’s case? The intuitive feeling would be that weaker links indicate less valuable, inconsequential connections, or acquaintances that did not blossom into friendships. However, though it is true that stronger links will, in close analysis, tend to reveal more about relationships between the writers, there is a large body of literature in social network analysis that has demonstrated how weak links are crucial components of a network, especially for the question of how knowledge is transmitted. This is where the contextualization of Milton’s network becomes particularly important. In his hugely influential 1973 article, “The Strength of Weak Ties,” Mark Granovetter argued that people’s social worlds tend to be made up largely of strong and weak ties, but that weak ties are much more important for the transmission of information.⁴² Strong links are highly embedded in one’s network and it is highly likely that the contact is shared with many others in the network—we know each other’s friends, and the same bits of information are passed between us. Weak links, by contrast, tend to be a bridge between two separate networks. Both by this feature and by the fact that it was deemed necessary to establish new contact, there is increased likelihood that new information is introduced into the network—we only make contact with a new person if we have something to say. An example would be the letter to Henri de Brass of 15 July 1657, in which Milton alludes to the nature of their initial contact:

But as to what you write concerning your decision to write to me and request my response with a view to elucidating those difficulties about

40. Peter Csermely, *Weak Links: The Universal Key to the Stability of Networks and Complex Systems* (Berlin: Springer, 2009), 3, dx.doi.org/10.1007/978-3-540-31157-7.

41. Haan, 92.

42. Mark S. Granovetter, “The Strength of Weak Ties,” *American Journal of Sociology* 78.6 (May 1973), 1360–80, dx.doi.org/10.1086/225469.

which for many ages historiographers appear to have been in the dark,
I for my part have never taken upon myself anything of this nature, nor
should I dare to take it on.⁴³

De Brass asked about the preferable style for writing historiography, to which Milton answers with his preference for Sallust. The contact was initiated only because information was to be shared or requested.

This example shows us the qualitative way in which we can evaluate the nature of Milton's epistolary connections, but how can we understand his position in the wider world of information exchange within the 7,253-correspondent network of EMLO? When working at this scale, evaluations can no longer be made on a case-by-case basis. How can we, therefore, understand how and to which communities these weak ties connected Milton? Numerous studies have proposed ways of measuring the passing of information in networks based on Granovetter's classic work.⁴⁴ Betweenness centrality is one such measure. For any two nodes in a network, there is a shortest path between them, and betweenness tells us how many of these shortest paths go through a given node. In other words, it shows us how central a particular node is to the network's organization, and how important it is in connecting other people. For this reason, betweenness has been used by scholars to think quantitatively about the influence a node may have on the flow of information across the network.

Because Milton's network is constituted by a high number of weak links, he scores highly for betweenness centrality, ranking 88, which is in the top 2 percent (1.2 percent). This means a lot of short paths flow through him, which seems to suggest a position of influence. However, this picture is complicated by another global statistic called "eigenvector centrality." Eigenvector centrality is essentially a measure of importance or prestige within an epistolary network, equating influence with the strength and range of connection. Influence also accumulates across network connections—one's influence is amplified by the

43. Haan, 318.

44. For more information on weak links, betweenness, and more generally a node's position in a network, see Thomas Valente and Kayo Fujimoto, "Bridging: Locating Critical Connectors in a Network," *Social Networks* 32.3 (2010): 212–20, [dx.doi.org/10.1016/j.socnet.2010.03.003](https://doi.org/10.1016/j.socnet.2010.03.003); Martin G. Everett and Thomas W. Valente, "Bridging, Brokerage and Betweenness," *Social Networks* 44 (2016): 202–08, [dx.doi.org/10.1016/j.socnet.2015.09.001](https://doi.org/10.1016/j.socnet.2015.09.001); Linton C. Freeman, "A Set of Measures of Centrality Based on Betweenness," *Sociometry* 40.1 (1977): 35–41, [dx.doi.org/10.2307/3033543](https://doi.org/10.2307/3033543).

connections of one's contacts. If node A connects with (or influences) node B, but B in turn is connected to many other nodes, node A is accounted an important node in the network, and would be so even if not connected to any other nodes. Milton ranks 1,618 for eigenvector centrality, which is just below the top 20 percent (21.5 percent) of the archive. This low ranking shows us that he is at a remove from those nodes regarded to be "influential" by this measure.

Milton's network profile, which combines relatively high betweenness and low eigenvector centrality, gives us an important insight about his position in the network. His high betweenness would indicate he acts as one of two types of node, both of which score highly for betweenness centrality: bridges (people who connect different communities) and hubs (nodes at the centre of a community, with a disproportionately high number of connections). We often see that those who score highly on betweenness also score highly on eigenvector centrality, but this is not the case for Milton.⁴⁵ This implies that within the context of EMLO, Milton is relatively far removed from centres of power—those correspondents with the very highest numbers of connections. However, at the same time he was relatively well placed between different networks. This conclusion can be supported by a look at his connections. Although some of his correspondents knew one another, such as Oldenburg and Jones, the majority of Milton's network did not, and were in fact in completely different networks—a reflection of his diverse connections. Milton thus frequently operates as the shortest path or bridge between these different worlds. By looking at how his network intersects with other networks, we are able to say more about how his network is placed within EMLO and precisely which communities he bridged.

Intersecting networks

The discussion of weak links and betweenness, above, points to another important aspect of the position of a network, namely the overlap or intersection of different networks. This is a method that has been developed specifically by Sebastian E. Ahnert to harness the rich possibilities of overlaying multiple

45. These patterns can differ considerably when the node has a particular correspondence network, such as spies, who have a high betweenness but low eigenvector centrality; see Ahnert and Ahnert, "Metadata," 27–51.

correspondence archives, as we have in the case of EMLO. Such a method allows us to extract the points of intersection between known individuals' communications, and thereby to understand the relationship between certain communities (fig. 4).

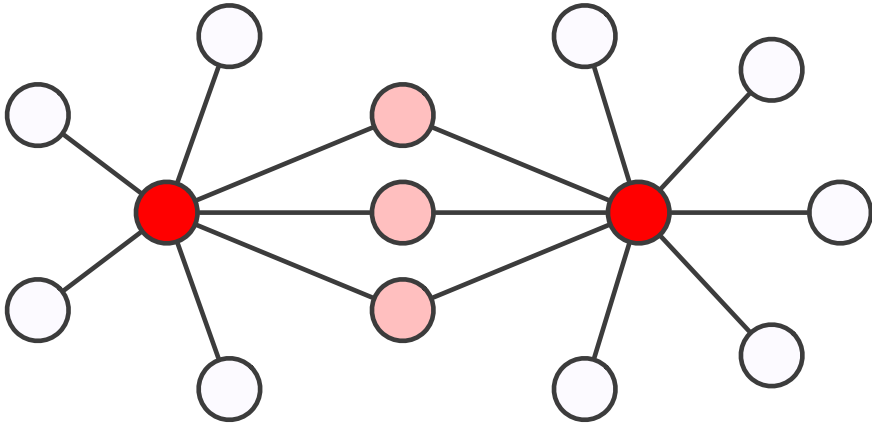


Figure 4. Network of Intersection.

Such intersections were extremely difficult to detect in the past because of the way that they often cross multiple archives, and even nations; an analogue approach would necessarily be partial (missing connections) and highly laborious to reconstruct. Now, with a few lines of code, and in a matter of seconds, it is possible to generate a list or visualization of all the correspondents shared by any two (or more) selected people.⁴⁶ For Milton we find that he shared two or more correspondents with fourteen people in the EMLO archive, demonstrated in Table 2, below.

46. Overlaps have been cut off at two people in common as a minimum. If we included everyone with whom Milton had one correspondent in common, we would have to include everyone with whom Sir Bulstrode Whitelocke, for example, was communicating, because Whitelocke's correspondents would have Whitelocke in common with Milton.

Table 2. Milton's overlapping correspondents

Overlap with Milton	Number of people in common	Names of people in common
Isaac Vossius	5	Carlo Dati, Ezekiel Spanheim, Emericus Bigotius, Henry Oldenburg, Lucas Holstenius
Samuel Hartlib	4	Richard Jones, Thomas Young, Henry Oldenburg, Moses Wall
Robert Boyle	3	Richard Jones, Ezekiel Spanheim, Henry Oldenburg
John Dury	3	(Sir) Bulstrode Whitelocke, Thomas Young, Henry Oldenburg
Christiaan Huygens	2	Carlo Dati, Henry Oldenburg
Gerardus Joannes Vossius	2	Lucas Holstenius, Henry Oldenburg
John Beale	2	(Sir) Henry Wotton, Henry Oldenburg
Elias Ashmole	2	(Sir) Bulstrode Whitelocke, Henry Oldenburg
Hugo Grotius	2	Lieuwe van Aitzema, Lucas Holstenius
Constantijn Huygens	2	Henry Oldenburg, Ezekiel Spanheim
Peter Lambeck	2	Henry Oldenburg, Lucas Holstenius
Mr. Pradilleis	2	Henry Oldenburg, Richard Jones
Edward Bernard	2	Henry Oldenburg, Ezekiel Spanheim
Patrick Young	2	Thomas Young, Lucas Holstenius

Several notable patterns emerge from this table. A first observation is that the most frequently occurring person in this list is Henry Oldenburg (1619–77), one of the major intelligencers of the seventeenth century, secretary of the Royal Society, and instigator of a huge correspondence network.⁴⁷ He occurs as

47. Marie Boas Hall, "Oldenburg, Henry [Heinrich] (c. 1619–1677), scientific correspondent and secretary of the Royal Society," *Oxford Dictionary of National Biography*, 23 September 2004, oxforddnb.com/view/10.1093/ref:odnb/9780198614128.001.0001/odnb-9780198614128-e-20676.

a connector between twelve of the fourteen people with whom Milton shares more than one correspondent. One reason for Oldenburg's presence can be attributed to the size of his surviving archive. In the EMLO database, Oldenburg received letters from 285 people, and sent letters to 277 people. He ranks fourth in the database based on his total-degree. His dominant presence in the network makes it statistically likely that their worlds would overlap. Richard Jones (1641–1712) appears as a connector between three correspondents, and notably co-occurs with Oldenburg in all three cases. Jones was the only son of Lady Ranelagh (briefly mentioned above) and also a pupil of Oldenburg.⁴⁸ Together with his tutor he travelled in France and wrote back to Milton on this journey. Milton would often respond by writing a letter to each on the same day, such as the two letters on the 1 August 1657 when both men were in Saumur. They are strong links in Milton's network, and it is no surprise to find them in the table with several shared correspondents such as Isaac Vossius and Samuel Hartlib.

Second, in the list of people with whom Milton's correspondence overlaps, a strong Anglo-Dutch divide is evident: on one side we have Robert Boyle, John Dury, and Samuel Hartlib; and on the other side, humanist and diplomatic stalwarts such as Hugo Grotius, Gerardus Vossius, and Constantijn Huygens. It reveals two prominent network circles of the Republic of Letters: the Hartlib Circle and a community of Dutch scholars. These circles had a close-knit network, and of the people in the table, several corresponded with each other: Dury with Hartlib and Boyle, or Isaac Vossius with his father Gerardus (naturally), and Grotius. However, there was curiously little contact between these Dutch scholars and the Hartlibians. Milton can be found on the periphery of both these circles.

One might suspect an overlap with the Hartlib Circle, since it is well-known that Milton flirted with their network, not least seen by Hartlib's request for—and Milton's consequent dedication to Hartlib of—his tract *Of Education* (1644). Timothy Raylor has shown that Milton had a profound influence on the pedagogical works of the Hartlib Circle, that the two men cooperated in the design of an engine of war in the early 1640s, and that Hartlib circulated

48. C. I. McGrath, "Jones, Richard, earl of Ranelagh (1641–1712), politician," *Oxford Dictionary of National Biography*, 23 September 2004, oxforddnb.com/view/10.1093/ref:odnb/9780198614128.001.0001/odnb-9780198614128-e-15072.

Milton's works such as *Areopagitica* among his circle in the 1650s.⁴⁹ Milton's connections to the circle are well evidenced and various. The question is rather why there is no existing correspondence between Milton and any of the other Hartlibians, a question that will be further examined below. Milton's association with the Dutch scholars is more complex. Hugo Grotius and Gerardus Joannes Vossius died in 1645 and 1649 respectively, i.e., before Milton's correspondence network really took off. However, father and son Huygens and Isaac Vossius were active in the same decades as Milton. Similarly to the Hartlib question of shared interest and intersecting networks, we will suggest briefly how and why Milton's network overlapped with the Dutch circle but without leading to any subsequent direct contact.

Of the fourteen people in the table that reveals the intersection of networks, there is not one with whom Milton shares direct correspondence. This is a curious result. When we have applied this method to other combinations of people, we usually find that the figure with whom a given individual shares most correspondents is almost always someone with whom they already corresponded. This tendency is explained by the concept of *triadic closure*, which contends that if A opens a channel of communication between B and C, there will be a tendency for B and C to close the circle and begin communicating directly.⁵⁰ For example, since Milton corresponds with Oldenburg and Oldenburg corresponds with Hartlib, it can be expected that Oldenburg would seek to close the triangle of communication and initiate contact with Hartlib directly, especially since they are likely to have shared interests. We have seen that Milton initiated closure by introducing Oldenburg to the Jones family, thereby closing that triangle. For these fourteen people, there is no closure. There are two possible reasons that might explain such a result. The first and most obvious point is that we do not have all the data. As discussed above, the scattered archives mean that much correspondence is now lost to us permanently, and the collection policy behind EMLO means that it is a work-in-progress and, of necessity, a piecemeal construction. Edges that appear to be missing therefore may be evidenced elsewhere; we will discuss below some ways of recovering some of this information.

49. Timothy Raylor, "Milton, the Hartlib Circle, and the Education of the Aristocracy," in *The Oxford Handbook of John Milton*, ed. Nicholas McDowell and Nigel Smith (Oxford: Oxford University Press, 2011), 383–406; Raylor, "New Light on Milton and Hartlib," *Milton Quarterly* 27.1 (1993): 19–31, dx.doi.org/10.1111/j.1094-348X.1993.tb00807.x.

50. For more information on network metrics, see the resources in note 45, above.

The second possibility, however, is that a triad could have intentionally been left open. There are compelling reasons to suggest this may have been the case with regards to key figures in this wider network.

The mention network

So far, we have established that Milton's correspondence places him in the top 10 percent of correspondents in EMLO in terms of his number of contacts and the volume of letters exchanged; that this network has a high number of weak links; and that there is little contact between his correspondents. These weak links affect Milton's betweenness, which is relatively high, meaning that he is positioned between key hubs and communities, specifically those of the Dutch scholars and the Hartlib Circle. Notably, within the body of extant correspondence, he has no direct correspondence with those with whom he shares the greatest number of correspondents. One might expect that Milton would have included letters that suggested connections to these circles in his edited collection. In this section, we will attempt to find an explanation for why there was no direct correspondence with these circles, despite several people who could have made the connection.

Milton writes in a letter to Alexander Gill on 4 December 1634 that he hopes to meet his friend near St. Pauls: "Farewell, and expect me on Monday (God willing) in London among the booksellers."⁵¹ The content of the letters can thus be an indication of contact that took place without a letter to evidence it; this is what Ruth Ahnert has dubbed the "mention network." It reveals a network of meetings with references to, or information about, individuals who were not evidenced through direct correspondence but spoken about to a third party: for example, to make introductions, or to simply reveal that someone knew of someone.⁵² It could also be used to assist the logistics of maintaining epistolary exchange, as is visible in the letter of 24 March 1655 to Ezekiel Spanheim of Geneva:

51. Haan, 82.

52. Ruth Ahnert, "Maps versus Networks," in *News Networks in Early Modern Europe*, eds. Joad Raymond and Noah Moxham (Leiden: Brill, 2019), 130–57, 143–44, [dx.doi.org/10.1163/9789004277199_006](https://doi.org/10.1163/9789004277199_006).

In the meantime, any letter which you intend for me you should address—not in vain, I think—to Turretini of Geneva, who is staying in London, and whose brother over there you know. By his agency, just as this one of mine will reach you, so will yours reach me most conveniently.⁵³

By systematically recording mentions in a network, one is able to place these mentioned people as nodes and edges into a network and increase its population.

The generation of a mention network is easiest when working at the small scale, when mentions can be derived manually by simply reading each letter, which results in full and clean results.⁵⁴ Working with digitized texts or fulsome synopses is the next best thing, but then one needs to consider the payoff between ease of extraction (e.g., searching the contents for names of the sender and recipient, with spelling variants), which will give a rough and ready but necessarily incomplete set of results, or spending much more time on developing methods of Named Entity Recognition, which will give more complete results but require further manual cleaning.⁵⁵ Because of the different hands involved in its creation, EMLO's archive has varied levels of data across the meta-archive: for some letters, transcriptions are available; for some, additional metadata including mentions have been added; for many, though, there is just the basic metadata. Fortunately, some of the correspondents with whom Milton intersects do have that additional metadata, including Isaac Vossius, Samuel Hartlib, and John Milton himself. What this means is that we can query this data to see if there are mentions where no connection exists between Milton and those key hubs within the Hartlib Circle and the Dutch scholars.

It is relatively well known that Isaac Vossius discussed Milton and his work in letters to his friends Nicolaas Heinsius and Johann Frederick Gronovius.⁵⁶ In

53. Haan, 258.

54. See, for example, Ruth Ahnert and Sebastian E. Ahnert, "Protestant Letter Networks in the Reign of Mary I: A Quantitative Approach," *ELH* 82 (2015): 1–33, [dx.doi.org/10.1353/elh.2015.0000](https://doi.org/10.1353/elh.2015.0000). On the challenges of "data cleaning" persons in epistolary data, see chapters 2.4, 3.1, and 3.2 in Hotson and Wallnig, eds.: Howard Hotson, Thomas Wallnig, Jouni Tuominen, Eetu Mäkelä, and Eero Hyvönen, "People," 119–36; Dirk van Miert and Elizabethanne Boran, "Assembling Metadata," 193–222; and Eero Hyvönen, Ruth Ahnert, Sebastian E. Ahnert, Jouni Tuominen, Eetu Mäkelä, Miranda Lewis, and Gertjan Filarski, "Reconciling Metadata," 222–36.

55. Ahnert, "Maps versus Networks," 147–48.

56. See, for example, Gordon Campbell, *A Milton Chronology* (Basingstoke: Palgrave Macmillan, 1997), [dx.doi.org/10.1057/9780230371866](https://doi.org/10.1057/9780230371866); David Masson, *The Life of Milton*, 8 vols. (Cambridge: Macmillan

this case, Milton is very much part of the mention network of Vossius, Heinsius, and others to whom they mentioned Milton. These mentions can sometimes provide answers as to why there was no direct contact and reveal more about the position of Milton's network within the wider context. All the mentions of Milton in the letters are in relation to his *Defences*. Milton's tracts were written in response to Claude Saumaise's (or Salmasius's) tract *Defensio Regia pro Carolo I.* (1649), published in the Netherlands. The Heinsii and the Vossii had a personal feud with Salmasius, and Isaac and Nicolaas were following the intellectual controversy between Salmasius and Milton closely. In a letter sent by Isaac Vossius from Stockholm to Nicolaas Heinsius on 12 April 1652, we find evidence of Isaac and Nicolaas reading Milton:

Liber Miltoni heri huc est allatus. Exemplar meum petiit a me Regina. Ipse non nisi cursim dum perlustravi. Nihil tale ab Anglo expectaram, et certe, nisi me fallit animus, placuit quoque, uno tantum excepto, incomparabili nostræ Dominæ. Dicit tamen Salmasius se perditurum auctorem cum toto parlamento.⁵⁷

Milton's book came here yesterday. The Queen asked my copy from me. I have only run through it hastily. I had not expected such a thing by an Englishman; and, unless I am mistaken, it has also pleased, with only a single exception [Salmasius], our incomparable Lady. Salmasius, however, says that he will send the author and his whole parliament to perdition.⁵⁸

Heinsius in turn reveals in a letter of 18 May 1652 the popularity of Milton's tract in the Netherlands. Although the places he mentions are also interesting for their publication history, for our purposes the salient fact is that Milton's tract was clearly widely read among members of the Dutch humanist milieu.

Est hic liber in omnium hic manibus ob argumenti nobilitatem & jam quatuor, præter anglicanam, editiones vidimus: unam in quartâ,

Press, 1887), vol. 4; Esther van Raamsdonk, "Chapter 2: Milton's *Defences* and Dutch Printing Culture," in *Milton, Marvell, and the Dutch Republic* (London: Routledge, 2021).

57. Petrus Burmannus, *Sylloge Epistolarum a Viris Illustribus Scriptarum*, 3 vols. (Leiden, 1727), 3:603. All the dates in the Isaac Vossius and Nicholaas Heinsius correspondence are in the Gregorian Calendar.

58. These translations are by Esther van Raamsdonk from *Milton, Marvell, and the Dutch Republic*, 59.

ut vocant formâ Goudæ editum, tres in duodecima, quarum primam ludovicus Elzevirius, secundam Johannes Jansonius, tertiam trajentensis nescio quis edidi: quinta in octava forma editis Hagæ sub prælo sudat, ut monet Elzevirius. Belgicam versionem video etiam circumferri, Gallican expectari ferunt.⁵⁹

The book is in everybody's hands here on account of the nobility of the argument and we have seen already four editions, in addition to the English one—one in so-called quarto, published at Gouda; three in duodecimo, of which the first by Lodewijk Elzevier, the second by Johannes Janssonius, and the third by an unknown person at Utrecht: a fifth edition is printed in octavo at a press at the Hague, as Elzevier told me. There is also a Dutch version around, and a French one is expected.⁶⁰

Other Dutch scholars became involved and reported further news on the developments of the battle between Milton and Salmasius, such as to Johann Friedrich Gronovius (1611–71), who was at Leiden at the time and corresponded with Gerardus Joannes Vossius, Hugo Grotius, Isaac Vossius, and Constantijn Huygens—exactly those people who already appeared when looking for networks that intersected with Milton. EMLO contains 241 letters sent and received by Gronovius. Moreover, when we look at his intersecting networks, he overlaps the most with Salmasius himself (ten shared correspondents) without direct correspondence between the two, which demonstrates Gronovius's central place within the controversy between Milton and Salmasius.

Through these contacts, Milton's fame (or infamy) spread across the Dutch circle. The burning of Milton's tracts at Paris and Toulouse was reported upon by Vossius to Heinsius in a letter dated 5 August 1651.⁶¹ Although the quality of Milton's Latin was admired by many of the readers, the cause of his tract, namely support for the regicide, was not. Aitzema nicely summed up the attitude of these Dutch scholars to Milton's writings: "Milton from England refuted the same book of Salmasius; and a certain learned man from here wrote that Salmasius had defended a very good case very badly; Milton had defended

59. Burmannus, 3:603.

60. Van Raamsdonk, *Milton, Marvell, and the Dutch Republic*, 59.

61. Burmannus, 3:621.

a very bad case very well.”⁶² The learned man in this case must be Heinsius, who wrote the exact same thing in a letter to Gronovius of 1 July 1651. From the content of the letters, we can thus learn that there were most certainly links between Milton (or rather his work) and some members of the Dutch circle, and that they read his tracts and discussed them among themselves. It also gives us some indication as to why there is no direct correspondence between them. In addition, it illustrates the value of distinguishing between direct epistolary connections and the inferred web of connections that can be derived from mentions in letters. Even though they had a shared enemy in Salmasius, no common animosity was large enough to bridge the opinion that Milton was a dangerous regicidal republican whose acquaintance would probably be best avoided.

The mention network is equally useful for the explanation of Milton's position of remove from the Hartlib Circle. The Hartlib Papers project, hosted by the University of Sheffield, provides digitized texts of Hartlib's correspondence, his *Ephemerides*, and his notes, which allows visitors to perform keyword searches of Hartlib's archive. The first evidence of Hartlib's acquaintance with Milton comes from 1643, when Hartlib writes in his *Ephemerides* that “Mr Milton in Aldersgate Street hase written many good books a great traveller and full of projects and inventions.”⁶³ The Hartlib Papers reveal twenty-two mentions to a “Mr. Milton” by five people (Hartlib, John Dury, John Hall, Sir Cheney Culpeper, and William Rand, all of which are in some manner in EMLO). This relatively frequent appearance tells us a great deal about Milton's position within this network. These are some very central members of Hartlib's Circle, such as John Dury, who also has a central place in EMLO with 1,197 total-strength and is ranked 36th on betweenness centrality. These members exchanged information about Milton in letters, yet no extant correspondence between Milton and the Hartlib Circle exists. Moreover, John Sadler, another member of Hartlib's Circle, mentions a certain “Mr. Melton” three times in his correspondence, such as on 17 August 1648: “If I write not againe to my Good freind Dr. Coxe, I pray excuse it to him, till the next returne; for I feare

62. “Eenen Milton in Engelandt refuteerd ‘t selfe boeck van Salmasius; Ende seecker geleert man alhier, schreef dat Salmasius een seer goede saeck, seer qualijck had verdedicht; Milton seer wel een seer quade saeck;” Lieuwe van Aitzema, *Saeken van Staet en Oorlogh*, 14 vols. (Amsterdam: 1662), 4:205. Van Raamsdonk's translation.

63. “Samuel Hartlib's Ephemerides 1643,” Hartlib Papers, University of Sheffield, [30/4/89A].

This Packet will be very bigg. If you see Mr. Melton I beseeche you present my reall service to him; I spare him in not writing.⁶⁴ It is highly likely in the context of the Hartlib Circle that this refers to our Milton, something that Gordon Campbell in his *Milton Chronology* also assumes, which means that we could add Sadler to the mentions network.⁶⁵ The passing of greetings in Sadler's mention does imply that Milton, Hartlib, and likely Dury had face-to-face meetings, but the mentions become much rarer after 1654. Timothy Raylor hints towards one explanation of why the contact ceased and argues that this "resulted from suspicions within the circle about Milton's political and religious heterodoxy," a potentially very similar motivation to the Dutch circle and their lack of contact.⁶⁶

In this section we have seen several reasons why people were familiar with Milton's name and his works but also why there was no direct inclusion of Milton into people's epistolary network; he remained, perhaps, more written about than written to. It remains to ask what these associations mean for Milton's position within the greater dataset. If we treat the mentions as tangible connections between nodes, Milton's place in the network changes instantly. From twenty-six connected nodes, he moves to thirty-five (through the adding of Isaac Vossius, Gronovius, Nicolaas Heinsius, Hartlib, Dury, Sadler, Hall, Culpeper, and William Rand). Milton's reputational reach is noticeably large, but this is not reflected in his concrete and extant correspondence.

Do the mentions close Milton's open triads as discussed above? The simple answer is no. Many of the triadic connections remain open, as none of the people mentioning Milton writes directly to someone to whom Milton is also writing directly. They would be closed if, for example, Isaac Vossius would write about Milton to Oldenburg, or vice versa. This once again reinforces the important realization that most of Milton's letters were carefully selected to showcase diverse contacts, both in terms of the nature of the contact—the content of the letters—and the geographical location to which these were sent. When we add forty-five more letters that were not in Milton's own edited

64. "John Sadler to Hartlib, 17 August 1648," Hartlib Papers, University of Sheffield, [46/9/4A]; two other mentions: "John Sadler to Hartlib, undated," [46/9/17A], and "John Sadler to Hartlib, 15 September 1648," [46/9/6A].

65. Campbell, *A Milton Chronology*, 96.

66. Raylor, "New Light on Milton and Hartlib," 23.

collection and we use the vast contextualizing data of EMLO and some of their mentions, this impression still stands.

Milton can be conceived of as hovering on the periphery of two of the greatest network circles in the Republic of Letters: a community of Dutch scholars and the Hartlib Circle. He knew, or was known by, key figures of the age, but seems to have remained something of an outsider to the inner circles—again a view in harmony with existing scholarship but here given a very visible demonstration. By looking at the mentions in some of the letters, we can evidence some reasons for Milton's peripheral standing, relating not so much to the possibility of contact as to the choices and preferences made by participants in the Republic of Letters.

Conclusions

The conclusions we might draw from this analysis are twofold. The methods employed in this article contextualize Milton's surviving correspondence in order to reveal an intellectual with diverse connections, ranging from letters to good friends, Italian intellectuals, and work acquaintances. He had, moreover, a considerable geographical reach with letters over all of Western Europe. It is consequently no surprise, then, that he would score relatively well on betweenness—bridging networks and people without other points of contact—an indicator of how well he was placed within the Republic of Letters. He was well connected, partly through his acquaintance with some of the great correspondents, such as Oldenburg. What the mentions reveal, however, is that despite this reach and diversity he remained on the fringes of a number of key intellectual communities. The content of the letters suggests that this is likely because of his radical convictions.

These insights, however, rely on the mutual availability of a large contextualizing data set (provided here by EMLO) and methods derived from the field of network science, which brings us to our second conclusion: that network analysis holds huge potential for the harnessing of resources like EMLO to study correspondence and intellectual exchange. In particular, we believe the method for generating lists of overlapping correspondence is especially valuable for gaining insights from multiple overlapping correspondences (or ego networks), which has become a possibility for researchers thanks to the formation of meta-archives such as EMLO. In this case we were able to discover

the weak ties with which Milton surrounded himself: the fact that none of the people with whom he shared most correspondents were themselves exchanging letters with Milton.

More broadly, however, we hope to have demonstrated the important interdependence of careful archival work and quantitative methods in the generation of these insights. Our findings are not only about simple statistical outcomes; they also prompt us to re-examine our assumptions about Milton and delve further into the available information. These analytical techniques are as useful for the questions they allow us to ask as they are for the answers they generate. The future of humanities research will never be solely digital, but it will be collaborative, incorporate a mixture of well-chosen methods, and allow us an ever-greater range of quests and questions. Perhaps we can follow Milton's council in a letter to Henri de Brass of 16 December 1657, and continue exploring the possibilities that network analysis offers: "I for my part do fervently wish you every success and safety in both your studies and in your travels, and a favourable outcome worthy of that enthusiasm and attentiveness which I see you apply to every excellent exploit."⁶⁷

67. Haan, 342.