"MORE DIFFICULT FROM DUBLIN THAN FROM DIEPPE"

Ireland and Britain in a European Network of Communication

Recent Early Modern news histories have tended to emphasise the international scope of the networks on which news travelled. Advances in digital humanities, particularly network analysis, allow for the examination of news as a complete network, and this article will explore the ways in which, using these techniques, the connections between Ireland and Britain can be thought of as not only local, peripheral and bilateral but also within a larger, European news system. Using network science, originally developed for the analysis of the World Wide Web, this article shows that the European system has universal network properties: it is scale-free, divided into clusters and exhibits the 'small world' phenomenon, explaining its resilience to interruption and the relative efficiency of early modern information transfer.

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In a story from the *Moderate Intelligencer,* a London newsbook, datelined Hamburg, July 21 1649, the author writes thus of the war between the Polish and the Cossacks:

> '..that as of old in the War of Alexander and the Romans, so lately in Ireland, and in this, it appears, that it's not the multitude that overcomes, but the wisdom and valour of men, of a very numerous Army, a few usually turns the Scale"[i]

How could a writer of news, based in Hamburg, writing about war in Poland, know about the wars in Ireland? It is an unlikely phenomenon: two events, very much unrelated to each other and separated by well over a thousand miles, are connected through a largely unplanned system of communication. Recent research has emphasised the pan-European nature of the flow of news. This article attempts to show some concrete ways in which we can understand Britain and Ireland's place within this complex and organic system. How can a system be both local and international? How can it work with such efficiency despite no central planning? What does it mean to be 'central' to the news network, and how does that fit in to our ideas of centre and periphery? The article analyses data collected from London newsbooks in two key ways to suggest answers to these questions, using both mapping software and network analysis. These methods allow for the production of maps which show

Britain and Ireland's position in the overall geography of news, network diagrams which examine the flow of information, and produce network centrality scores which highlight structurally important nodes.

London's first real newspapers, the 'newsbooks' of the 1640s contain a great deal of content from Ireland; a quick scan of a handful of titles would make this immediately clear. Only a few European cities could boast as much coverage as Ireland in London newsbooks.[ii] Regular periodical news is dependent on a regular periodical post, and the rise of the newsbook was contingent on the development of the postal service, and its Irish news dependent on a good postal route to and from its shores. By the end of the Stuart reign this had been achieved to some degree: by the 1640s there were two packet boats to Ireland, usually on the routes from Chester to Dublin and Milford Haven to Waterford.[iii] News from Ireland could arrive in England from one or the other, and often both.[iv] Crucially, news could also easily get from London to these packet boats: there was a post route as far as Holyhead, for royal use but permitted to carry private mail.[v] Mark Brayshay's recent work on the Tudor and Stuart postal system has shown it to have a depth of sophistication and reliability, and contributed to a realm that was becoming 'significantly more joined-up.[vi] It was reasonably priced and relatively quick: The post from London to Chester took an average of about 40 hours.[vii] This was connected, through Dover, to a European postal network that was going through a 'communications revolution', one in which the space-to-time ratio was steadily shrinking.[viii]

There is textual evidence for interest in Irish news. In June 1649, as rumour began to overtake official reports of events in Ireland, *The Kingdomes Weekly Intelligencer* began with the following:

> "The general Demand of the people is, What is your Newes from Ireland? The sellers of the weekly sheets make answer, aloud in the streets, Newes hot from Ireland" [ix]

Most of 1649 had been the same: With the death of Charles I at the end of January, the interest of news was shifting from strictly domestic politics to other topics and Irish news, operating within a 'paradigm of barbarity', partially satiated this appetite.[x] News-writers were concerned with capitalising on this interest in Irish news: Richard Collings, the editor of the *Kingdom's Weekly Intelligencer* wrote in June 1649:

> "There is a Report of a Battell fought betwixt the Lord *Inchequine*, and *Owen Roe* in which it is sayd, that the *Lord Inchequine* had the better, I have been diligent in the Inquirie, and can find nothing but a Report to confirm it"[xi]

Using traditional methodology and textual evidence based on close reading, the historian of the English newspaper has long known that Irish news had an importance. But news has further properties which do not reveal themselves with these methods.

History has in recent years undergone a 'spatial turn', although this is not the first time: Braudel and the Annales were the first to link geography and history.[xii] The difference here is data and computation: data can now be harvested from increasingly enormous databases and can be displayed and mathematically analysed using easily-available computing power. Projects like Blevin's 'Mapping the Production of Space' have taken the idea of people 'producing' space, outlined by Henri Lefebvre, and using data models and text mining have put forward ideas and visualised how this actually worked in practise, using 19th century American newspapers.[xiii] 'Mapping the Republic of Letters', a project undertaken by the Stanford Spatial History group, has created interactive maps tracing the dissemination of information throughout Europe and America.[xiv]

Perhaps in the historiography of news it would be more apt to think of a 'networked' rather than spatial turn. Going beyond the idea of simply mapping and visualising geographic connections between places, a networked approach considers information as a system of dynamic flow. *News Networks in Early Modern Europe* published in 2016 and edited by Joad Raymond and Noah Moxham is the most significant study in this regard, pushing the scholarship in a new direction: looking both at the overall picture whilst filling in the individual component parts of the system, drawing together several sources and work from many distinct national news databases. Raymond pushes for the utilisation of techniques from other disciplines, in this case STEM subjects, in order to fully understand the system of news in Europe.[xv] The volume uses the science of network analysis to show that the European news system can be understood using the same universal science behind the understanding of many other networks: biological, neurological, social and purely mathematical.[xvi] Raymond's chapter in that volume is not a case study, although there are others in the text dealing with specifics: Renate Pieper's chapter is particularly relevant, as it deals with geographic information flow rather than content.[xvii] This builds on other work analysing the geographic distribution of datelines, including that of Paul Arblaster, looking at news in Antwerp, and Nicholas Schobesberger, whose work on the manuscript newsletters of the Fugger family has shown how mapping places of dispatch can create a geography of the movement of news throughout Europe. Several articles in *News Networks in Early Modern Europe* use network theory for part or all of their research. This article develops these ideas to form a concrete analysis of British and Irish information exchange in the civil war period.

Network theory developed from the mathematics of graph theory and social network analysis pioneered as by Mark Granovatter and others in the nineteen seventies, and was further

developed in the late nineteen-nineties by Alberto Barabasí. It is a system for dealing with complex networks using computational data and physics.[xviii] Originally developed with the purpose of putting structure to the incomprehensibly vast map of the internet, studies have shown that the same underlying network structure can be found in connected systems of all types, both natural and man-made. Many of these are 'scale-free' (the degree distribution follows a power law, meaning that the vast number of connections go to a small number of nodes), and that a 'small-world phenomenon' can usually be observed, which means that despite the sparseness of a network, every part of it can be reached in a small number of 'hops' thanks to its structure as a series of densely connected individual clusters.[xix] Small-world networks display properties of both random and ordered graphs: this means that they are both highly clustered, like a lattice, and have small path lengths, like a random graph.[xx] Networks of this type allow for the quick movement of information through them. For example, small-world networks allow infectious diseases to spread more easily than other network types.[xxi] The network of news found through the collection of data described here fits this universal pattern, confirming the theory put forward by Raymond et al: that news was a self-organised network which displays small-world properties.[xxii]

To determine the properties of the news network, metadata from news stories printed in London has been collected. As a project concerned with information flow through cities rather than tracing text reuse through titles, two sample databases were chosen, designed to be complementary. The first is the entire run of the *Moderate Intelligencer*, a title published by John Dillingham which contained both domestic news and probably the best foreign news coverage in London, a total two hundred and thirty nine issues in twenty two titles, printed between 1645 and 1649. The second dataset is a cross-sectional one, three hundred and forty two titles, of every newsbook printed in 1649 until the licensing act in October forced the

closure of all existing publications, and includes long-running titles such as *Perfect Diurnall,*

Perfect Occurrences and *Kingdomes Weekly Intelligencer,* as well as a number of ephemeral

or short-lived publications. Royalist and Republican polemical titles, such as the various

Aulicus and *Elencticus,* are not possible to parse into structured data, and have been omitted.

News in the 17th century is broken into individual chunks: paragraphs which are translated,

transformed, inserted and removed at will by editors.[xxiii] Much of the foreign news printed

during the first era of newsbooks followed a similar 'macrosyntactic' organisation: a date-

line and location, but no headline, consistent with older manuscript newsletters and *avvisi*.[xxiv]

These units, rather than full titles, move through space and time. Will Slauter, writing about

the eighteenth century, calls them 'paragraphs'.[xxv] They have also been referred to as

'snippets' and Brendan Dooley uses the term 'periods' in a recent article, a term used to

describe a a circulating composition of words, and implies 'segmentation as opposed to

continuousness'.[xxvi] Newsbooks, then, can be thought of as a common protocol for the spread

of individual, discreet units of information (much like a neutral system for doing the same on

the internet like TCP/IP). It is these units which form the basis of the following analysis. For

each paragraph, information has been collected about where it has been dispatched from,

further places of dispatch, when it was sent, received and published, and information about

the category of news. The *Moderate Intelligencer* gives an overview of Ireland's position in a

title concerned with foreign news and is just about long enough to show trends over time, and

the January to October 1649 material gives an overall 'snapshot' of everything printed from

London, albeit with a restricted time-frame.

To start with a straight-forward quantitative question: How much news from Ireland was

being reported in London sheets, and what was it about? Of the 170,000 lines of text counted,

from both datasets, 3,384 come from Dublin, 1,282 the more general 'Ireland', and another 680 from Cork: 5,346 lines in total, or 3.14%. Looking at individual cities, news from Dublin is dedicated the fifth-largest number of lines, after Paris, Venice, Naples and Rome. Table 1 shows that there is also a strong correlation between number of lines and a city's population. Much of the Irish news was related, unsurprisingly, to the military campaigns of the New Model Army, but also the political intrigues of the main players: Owen Roe, the Earl of Ormond, and various generals with responsibility for Irish affairs. Domestic Irish issues, either political or otherwise, are almost non-existent. Figures 1 & 2 show the geographical distribution of news reported in London newsbooks.

[INSERT TABLE 1 HERE]

[INSERT FIGURES 1 & 2 HERE]

At the heart of this distribution is a postal network. Mapping the origin of news shows that source cities follow a rough outline of the various postal routes of central Europe, and in the case of England, the main 'spokes' of the postal system can be determined by looking at the pattern of towns with a high volume of news stories. Both in England and continental Europe, the system is based more on the postal network than on other variables such as population. Political and economic properties affect news volume. Key cities are underrepresented in London news, particularly Catholic rivals such as Madrid, and others are overrepresented, usually information and trading hubs like Venice. In the case of the cross-sectional data, it is clear that in terms of foreign news, Paris holds a particular importance to London news. The foreign specialist *Moderate Intelligencer* data shows a larger spread of locations, including more stories from Italy and the Netherlands. Good foreign news coverage needed a larger geographic coverage, as well as greater overall volume.

Looking specifically at Britain and Ireland: what can be said about the flow, or connectivity of this news – that is, where is Irish news travelling from and through? Looking at the news which has Dublin as its first source – that is, news arriving in London *from* Dublin, gives an idea of the secondary places in Ireland news was coming from. News from further afield than Dublin, on the rare occasions we are given secondary points of contact, usually comes from nearby counties: Kilkenny, Kildare, Carlow and more rarely from other parts of Ireland.

 [INSERT TABLE 2 HERE]

Each entry in the database contains the date the story was sent, along with the date of its publication. This means we can also estimate the length of time news from Ireland took to reach London streets, and therefore get a more 'real-world' picture than possible with postmarks (stamps on letter packets which record when they were received at various posts). Dublin and Cork are the only two places in Ireland for which enough data is available to make a meaningful conclusion. For the first ten months of 1649, there is an average of 12.5 days between the news being sent from Dublin and its publication in London; for Cork just over fifteen. Temporally then, Dublin is similar to Antwerp (11.5 days), Paris (12.3), Amsterdam (12.8), and news from Cork compares to the German cities of Cologne (15.6) and Munster (16.8). Full figures are in Table 1 above. Counting datelines in this way shows us valuable information on the routes news from Ireland took, and the length of time it took to travel, but it is possible to go beyond this statistics-based approach and understand the system of news through its networked properties.

Understanding the underlying network structure of the news system can help to fully understand the geography of news in Europe. The network has been analysed visually and

also using several key measurements: degree, betweenness centrality and eigenvector centrality. A network is emphatically not a map, though because news is based on the postal system and the geography of movement, it can often appear as one. A line through several nodes does not necessarily imply movement, or a knowledge of each node of any others except its immediate neighbour. Network diagrams work, rather, on pairs of connections.

Visualising all nodes in their relationship to the network as a whole we can get an overall picture of how Britain and Ireland fit in. For this the algorithm 'Force Atlas 2' was used, part of the *Gephi* network analysis package. This is a force-directed layout, which simulates a physical system to visually represent an abstract network.[xxvii] This visualisation method places highly connected nodes close to each other, based on the movement of information between them, and it puts places with high connectivity overall towards the centre of the diagram. The network diagrams below show a network with Britain and Ireland extremely close to each other – contrasting with, for example, important outliers like Venice and its connections to the Adriatic. The network drawn here follows roughly the contours of the postal network, with some key exceptions, discussed below.

[INSERT FIGURES 3 & 4 HERE]

Figure 3 is a network of the data from the Moderate Intelligencer, published between 1645 and 1649. Nodes with one connection or less have been removed for visibility but are included in the data modelling. This map shows a central core of highly-connected German states, with clusters based in Italy, Central/East Europe, and Britain and Ireland. The Moderate Intelligencer contains very regular news from Venice, usually with news from the Adriatic and the Eastern Mediterranean, explaining its disproportionate size. To an extent the network map follows postal routes, but interesting anomalies are visible: Edinburgh and

Northern England are placed closer to continental Europe because of direct connections to the Netherlands and Scandinavia, for example.

Figure 4 is a close-up of Britain and Ireland, taken from the *Moderate Intelligencer* data. This shows the nodes of Chester and Dublin as very close pairs. The news network between Britain and Ireland is reliant (but not entirely dependent) on key connecting nodes on English border or port towns. Edinburgh and Berwick show similar properties.

[INSERT FIGURES 5 & 6 HERE]

Figure 5 contains all the metadata from the January – October dataset, and shows a slightly different map of Europe to that seen in the *Moderate Intelligencer* data. Structural and generic differences between news systems are apparent in the topology of the network. There is a clear divide between Italian cities and Northern Europe, a division which can be seen elsewhere in the news system – Italian news still based largely on handwritten avvisi versus the printed news of Northern Europe. Some alternative routes of the network are clear here: there is a line running from Cork, to Scilly, to Jersey, to Paris. Routes like this are particularly important when usual channels of information are blocked, whether due to censorship, war or weather. Figure 6 is the January - October 1649 data, focused on Britain and Ireland. This diagram shows the importance of the middle cities: Bristol, Drogheda, Liverpool, Derry and Chester all act as points through which news passes on its way from Ireland to London.

Scale-free network topology describes a network that is a series of highly-connected individual clusters, with relatively few (and therefore very important) connections to the

wider network.[xxviii] These clusters are determined using an algorithm that checks every node against every other node to find the optimum 'neighbourhood' for each one.[xxix] The network analysis here shows three clusters in Britain and Ireland: one based around London and England, another based around Dublin-Chester and a third around Newcastle, Berwick and Edinburgh, which are highly connected, but their connecting parts, Dublin in one case, and The Hague going to continental Europe, mean that even with very few outgoing links, a strong and consistent connection can be made with the entire European network. These wider connections are reliant on nodes within the network which have particularly high *centrality measures*.

Network analysis allows us several different ways to measure the importance, or centrality, of individual nodes. The first of these, *degree*, simply counts the incoming and outgoing connections. Nodes with many connections are called hubs and are important for the facilitation of information transmission. A degree score gives a measure of the importance parts of the network based on the overall volume of information travelling through the points. Dublin scores highly here: Sixth-highest after Venice, Paris, the Houses of Parliament in London, The Hague and Genoa. A weighted measure – counting the quantity as well as the overall – puts Dublin first. The traffic of information between London and Dublin is more frequent than anywhere else on the network.

There are alternative methods to determine centrality, and these can expand our understanding of how a networked system works. *Betweenness centrality* looks at the likelihood of a node being used as a 'path' from each node in the network to every other node.[xxx] The measure is determined by calculating the shortest path between every pair of nodes in the network and ranking each node by how many of these paths pass through it.[xxxi]

This measurement can be used to determine a node's structural importance, and therefore influence as a facilitator of information flow through a network, and has been used, for example, to discover previously unknown but important influencers in the secret Protestant letter network during the reign of Mary I.[xxxii] In the case of the news network, well-known communications hubs such as The Hague, Venice, Regensburg, Augsburg and Venice stand out; within the British-Irish system, Dublin, as the hub of news from Ireland, scores highly here. Dublin receives news from all over Ireland and sends it outward to London. These are the nodes which allow for the 'small-world' phenomenon described above, ensuring easy propagation of information through the network.

Another measure of importance or centrality is *eigenvector centrality*: this measures the importance of nodes based on its connections to other *important* nodes. This is similar to the PageRank method for determining the authority of search results, developed by Google. This measure tends to find places which produce authoritative and trustworthy information. Cities such Vienna, Munster, Augsburg and Frankfurt score highly here, forming a central core of authoritative hubs in Central Europe, as well as a number of coastal towns on the Mediterranean. Britain and Ireland score lower than their continental counterparts: most cities in the archipelago are only connected to other non-important nodes. This suggests a certain degree of exceptionalism for Britain and Ireland in the European news system. Britain and Ireland are part of the overall network, but very much on the periphery, and although re-routing happens, there are less possible paths across the network than for cities in Continental Europe. In the case of Ireland, most nodes have low eigenvector scores. Irish cities are not directly connected to the central parts of the network but rather travel through secondary nodes such as Dublin and Chester.

Networks are resilient. Non-hierarchical, scale-free networks, that is, networks with important hubs, but also multiple potential paths between nodes, are highly efficient ways of moving information through a complex but somewhat anonymous system. Ant colonies, for example, rely on a scale-free network design in order to create food gathering systems and allow for wide scale re-routing in cases of obstruction, even though each individual organism is not aware of the whole. European news also operates within this structure. Looking specifically at Irish news shows how a decentralised, hub-based system works in practise. Chester, Bristol, Milford Haven and Liverpool are by far the most likely relay points between Britain and Ireland in both datasets, but more are available. News also often travels on a route from Dundalk, to Derry, to Edinburgh and finally to London. News can reach London first having travelled from Paris, Flanders, or the Hague. In a similar vein, news from the continent can occasionally bypass the ports of South East England and travel directly to Edinburgh from Antwerp, potentially reaching London along this route. The network is not entirely decentralised but rather relies on *multiple* hubs for efficiency and resilience. News also moves on informal channels when more formal or trustworthy sources are not available.

There are several reasons why network analysis is of interest to the study of news. Firstly, it allows an approach to the history of Irish-British connection in a different way. We can see that rather than being unimportant parts, these clusters are integral to the network as a whole; when taking a full overview, a network is the sum of its individual clusters rather than simply a dichotomy of centre vs periphery. Secondly, discovering formal network structures within this system of news allows the possibility of more detailed analysis using universal network mathematics, opening up the possibility of further research: for example, very recent published work on the 'resilience' of networks could, with enough data, shed light on reasons for lower communication at certain times, and suggest the likelihood of interruptions in

communication being because of failures in the network or censorship at the end point.[xxxiii] It can potentially predict the effect of interrupting events on the overall flow of news. Network analysis works alongside maps and postal itineraries, suggesting other measures of centrality that are not solely based on either geography or volume, showing cities which otherwise may have their role downplayed. Additional data, whether from printed or manuscript sources, private letters or public news, is needed in cases like this to flesh out the skeleton of the network topology. With data from enough cities, a much clearer picture of the spread of news should be possible.

The existing English language newsbook corpora: the *Zurich English Newspaper Corpus*, the *Florence Early English Newspaper Corpus* and the *Lancaster Newsbooks Corpus* allow for the study of news flow insofar as patterns of text reuse can be ascertained and traced through different titles. An addition to this would be to treat each news-unit as an individual object in a database, and record evidence of connections between cities. Existing newsbook databases could be reconfigured with different purposes in mind, incorporating a structured database which allows for the creation of entries for each story, which alongside semantic tagging would allow for the large-scale analysis of the circulation of news in a way not possible with a standard XML document. This database could be made easily transnational: network analysis alongside the identification of text reuse using plagiarism software allows for easy tracing over multiple titles and through multiple languages.

Such a database should allow for the recording of several important pieces of information: where a story has come from, where it has been sent to, and the topic of the story itself. This information should be linked, in a relational database schema, with geolocation data about each node, information about the publisher and printer of the title, and where possible,

information about the creator of the paragraph. Doing this would allow for very quick and sophisticated analysis: one could quickly call up every paragraph from Dublin printed by Robert Wood, across multiple titles, to see how they compare, for example.

 Machine learning and neural networks allow us to programme a computer to 'learn' and develop its own algorithms by providing it with examples, and this has had success figuring out semantics and Natural Language Processing (NLP), as well as vastly improving Google's translation engine.[xxxiv] Machine learning may allow us to finally perform accurate Optical Character Recognition (OCR) on early modern print, and there are now tools available to transcribe manuscript sources.[xxxv] Using NLP it should be possible to extract network metadata from the results. Existing projects to extract temporal data from modern news texts may eventually be reconfigured to do the same for early modern text. This would greatly improve the ability to understand the flow of information over the period – automatically populating a database as described above. As more material gets digitized, either manually or by sophisticated computer programs – pamphlets, private letters, newsbooks, whether by hand or through digital means, in both Ireland and Britain, to get the full value, it may be necessary to rethink the way in which they are collected: not only content but time and place metadata adds greatly to our knowledge of the communications system and our understanding of shared cultural transfer.

Official news from Ireland may have been frequent but was often delayed or failed to arrive at all. It was heavily dependent on weather: both stormy conditions and unfavourable winds could interrupt the packet boats. In November 1646 Dillingham, the publisher of the *Moderate Intelligencer,* seems to have lost his patience with the lack of news – his annoyance coming out on the page:

'No newes was come this day that our forces are got into Dublin, nor what is become of them', he writes, "More constant newes from Rome, Venice, from Turky, yea, almost from Jerusalem. Sure its not more difficult to hear from Dublin then from Deep?" [xxxvi]

Perhaps this frustration was justified, and there is evidence of the difficulty and sporadic nature of news from Ireland to be found elsewhere in the London newsbooks. Writing, perhaps drily, in March 1649, Dillingham commented that "There is no news from Ireland, except that the packet boat that should bring it is taken".[xxxvii] A month later, *The Moderate Intelligencer* once again reports no news from Ireland: "We have no Letters from *Dublin* this week", writes Dillingham, although he notes that 'the winde would have afforded Letters', implying there must be some other reason for the delay.[xxxviii] But news continued to arrive in London, and continued to be printed in London newsbooks, week after week, and through the resilience of the network, arrived on informal and alternative channels when the main routes were blocked.

The same summer, the second issue of a shortly lived seventeenth century newsbook, *A Moderate Intelligence* – not to be confused with the *Moderate Intelligencer* – contained a letter sent from Chester. Amongst some news about changing attitudes towards Parliament because of changing fortunes in the Irish wars, there's a marked tone of disapproval: "We wonder at your news in London", writes the author of the letter, "In the last weeks Moderate Intelligencer of a sheet and a half it was said that London Derry was taken, which to us is very false".[xxxix]Evidence of the reading of periodical news like this is relatively scarce. We do have a handful of diaries, and there is some manuscript and evidence in private correspondence, but every direct mention of a particular newsbook has historical significance.[xl] A news unit like this tells us, in a line or two, about the type of content and its

importance, but also something about the *flow* of news. News here is being sent from Derry, in Ireland, across to Chester, on both formal and informal channels. It's then being sent (in letters like the above) to London to be printed in its news-sheets.

This also tells us that readers in Chester had access to London news, that it is being sent back towards Chester on the same route. It's likely that the news gets passed on and crosses back over the Irish sea, either in its original form in texts such as the *Moderate Intelligencer*, or at the very least as part of the informal passage of information, as it gets read and disseminated, talked about in marketplaces and taverns, and brought across the sea as part of the cultural porousness between the two places.

News is critically evaluated. The *Moderate Intelligencer* might have had four years of authority, but the Chester reader knew to evaluate based on his superior place on this particular part of the network. The story may have been invented by the author, perhaps to discredit the *Moderate Intelligencer,* but the sentiment remained the same. Local knowledge produced a series of bilateral connections. Mini news-networks, with local hubs and structures, feed into a macroscopic, pan-European system. Local knowledge feeds back to the overall system, critically commenting on news stories and allowing for sources to be evaluated. The regularity and periodicity of newsbooks meant that they could be held somewhat accountable: at the very least they had to suffer the loss of reputation if they printed 'fake news'.

By looking at other sources we can infer further parts of the network: the quote from *The Moderate Intelligencer* from the correspondent in Hamburg at the beginning of this article is in some ways proof of the circulation of knowledge in two directions: a rather vast line of

information stretching from the battlefields of Ireland to the news-writers of Hamburg – not direct in the sense that information from Dublin was being deliberately sent straight to Hamburg, but indirectly, through several channels and probably over a long period. Posts, letters and newsbooks all facilitated this flow of information, but they do not fully explain it. The Hamburg writer doesn't know the Chester writer, but in an indirect way may have got his news from him, and vice-versa.

The news system, then, is both local and global in scope. Where does this place Britain and Ireland? The media connections between the two regions in the latter half of the 1640s were unique but also part of a wider system. Dublin served as a hub for news throughout the rest of Ireland, and Chester and Bristol served as chief relay points for news from Dublin itself. We can also say that the network of these two places can be described as part of a wider entity: an overall European system that can be said to have properties of a universal network along the lines of the Barabási–Albert model: it is scale-free, has a concentrated degree distribution, and relies on the 'strength of weak links' to allow for easy passage between its constituent parts. It is both international in scope and heavily reliant on local connections. The network is efficient, resilient to random failures, easily re-routable, and does not rely on each node having an awareness of any other node except its nearest neighbours. This helps to explain how the system of news can be both local and international. There is much work to be done: connecting individual databases can increase our knowledge of the system as a whole as well as its local strengths, weak points and eccentricities. Although this method currently needs manual input, much of the work can be done with datelines and locations, rather than full transcription, with the advantage that a picture of European news flow can be built up relatively quickly.

Reading news creates identity, but also contributes to a sense of place. Figuring out what the news is about and where it has come from contributes to that sense. Viewing the network of news allows us to think about the connection between Britain and Ireland as something uniquely bilateral but also as part of a wider European system. Media connections create identity: that Ireland and Britain share these connections points to a shared history, but also points to a shared history with Europe, one in which both Britain and Ireland were and still are prominent actors rather than peripheral or secondary partners, a sense of identity that is shared but also individual, and a view of space that is both local and at the same time expansive. A network is not a map: it is important to break through geographical boundaries to really establish the flow of information.[xli] A map draws our eyes to those well-worn lines of land and sea borders, places the two regions firmly at the corner of Europe rather than its centre, and makes it hard not to see Ireland and Britain as peripheral but somehow uniquely connected: a network diagram gives a true picture of that connectivity. 'More difficult from Dublin than from Dieppe' may not have been literally true, but illustrates the inherent entanglement of Ireland, Britain, and the rest of Europe.

[i] *The Moderate Intelligencer* 231, 16-23 August 1649, 2220.
[ii] See Table 2 below
[iii] Brayshay, *Land Travel and Communications,* 300.
[iv] *The Moderate Intelligencer* 231, 16-23 August 1649, 2215
[v] Arblaster et. al. 'European Postal Networks', p. 51.
[vi] Brayshay, *Land Travel and Communications,* 1.
[vii] Ibid., 287.
[viii] Behringer, 'Communications Revolution', 339.
[ix] *The Kingdomes Weekly Intelligencer 315,* 19 – 26 June 1649, 1401.
[x] O' Hara, *English Newsbooks and Irish Rebellion,* 17.
[xi] *The Kingdomes Weekly Intelligencer* 313, 29 May – 5 June 1649, 1384.
[xii] Braudel, *The Mediterranean,* 12.

[xiii] Blevin, 'Space, Nation and the Triumph of Region', 124.

[xiv] Ceserani, 'Interactive Visualizations for British Architects on the Grand Tour'.

[xv] Raymond, 'News Networks in Early Modern Europe', 5.

[xvi] Raymond, 'News Networks: Putting the 'News' and 'Networks' Back in', 115.

[xvii] Pieper, 'News from the New World', 498.

[xviii] Barabasí, 'Scale-free Networks', 52.

[xix] Barabasí, *Linked*, 67; for 'small world' discussion see 49.

[xx] Watts, 'The "New" science of networks', 244.

[xxi] Watts, Strogatz, 'Collective dynamics of 'small-world' networks', 442.

[xxii] Raymond, 'Putting the 'News' and 'Networks' back in', p. 115.

[xxiii] Raymond, *Invention of the Newspaper*, 266.

[xxiv] Brownlees, 'Narrating Contemporaneity: Text and Structure in English News,' 233.

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[xxvi] Dooley, 'International News Flows in the Seventeenth Century', 175.

[xxvii] Jacomy, Venturini, Heymann, Bastian, 'ForceAtlas2, a Continuous Graph Layout'

[xxviii] Barabasí, 'Scale-free Networks,' 53.

[xxix] Van Dongen, 'Graph Clustering by Flow Simulation', 1.

[xxx] Freeman, 'Measures of Centrality,' 35; Brandes, 'A Faster Algorithm for Betweenness Centrality', 2.

[xxxi] Ibid.

[xxxii] Ahnert, 'Maps versus Networks', 144.

[xxxiii] Gao, Barzel, Barabasi, 'Universal Resilience Patterns in Complex Networks', 307.

[xxxiv] Johnson et. al, 'Google's Multilingual Neural Machine Translation System,' 1.

[xxxv] Mühlberger, Colutto, Kahle, (forthcoming) 'Hand- written Text Recognition (HTR) of Historical Documents as a Shared Task for Archivists, Computer Scientists and Humanities Scholars. The Model of a Transcription & Recognition Platform (TRP)' (pre-print)

[xxxvi] *The Moderate Intelligencer* 91, 26 November – 3 December 1646, 773.

[xxxvii] *The Moderate Intelligencer* 209, 15 – 22 March 1649, 1654.

[xxxviii] *The Moderate Intelligencer* 1, 29 – 5 May 1649, 8 (one week using new numeration).

[xxxix] *A Moderate Intelligence* 2, 24 – 31 May 1649, 16.

[xl] For example, see discussion of the diaries of Nehemiah Wallington in Raymond, 'International News', 239.

[xli] Ahnert, 'Maps versus Networks', 131.