Telecommunications in the nineteenth century, with particular reference to Ireland

by

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Abbreviations

ANT	Actor Network Theory
B&I MTC	British and Irish Magnetic Telegraph Company
BETC	British Electrical Telegraph Company (also known as the BritishTelegraph Company, BTC)
BL	British Library
BPM&A	British Postal Museum and Archive, London
BT archive	British Telecom Archive, High Holborn, London
D.M.P.	Dublin Metropolitan Police
E&I MTC	English and Irish Magnetic Telegraph Company
E&I TC	Electric and International Telegraph Company
ETC	Electric Telegraph Company
I.R.B.	Irish Republication Brotherhood
LTS	Large-Scale Technological System
TNA	National Archives, Kew
NAI	National Archives of Ireland
NLI	National Library of Ireland
NTC	National Telephone Company
PA	Press Association
PRONI	Public Record Office of Northern Ireland
R.I.C.	Royal Irish Constabulary
SCOT	Social Construction of Technology
TCI	Telephone Company of Ireland
UKTC	United Kingdom Telegraph Company
UTC	United Telephone Company

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Introduction

> In the reconstruction of the past the historian rubs shoulders with, sometimes shakes hand with, and frequently picks the pockets of the archaeologist, and the philologist. He ought, more often than he does, to rub shoulders and share minds with the technologist. For technology, in its widest sense, is, much more often that ideology, the shaper of society.
>
> W.L. Warren[1]

Over the course of the long nineteenth century, technology was to transform Ireland beyond anything imaginable a hundred years before. Central to this transformation was the invention and implementation of a number of communication and transportation technologies. Fundamental to these developments were innovations in the use of steam for transportation and electricity for communication. The invention of steam-powered transportation, primarily locomotives and steamships, led to the acceleration of travel speeds and the compression of time and space. The development and expansion of optical and electric communication technologies, and the separation of information from physical transportation, brought about the dissolution of the relationship between time and space.[2]

This thesis aims to trace the development, implementation, growth and use of optical and electric communication in Ireland, over the course of the long nineteenth century. It will seek not only to present a narrative of the growth of the various communication devices that were adopted over the *longue durée*—the optical telegraph, the electro-magnetic telegraph and the telephone—but, importantly, to understand the factors that shaped the development of these technologies and the networked systems upon which they relied.

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[1] W.L. Warren, 'The historian as "Private Eye"' in J.G. Barry (ed.), *Historical studies, ix* (Belfast, 1974), pp 1-18, at p. 1.
[2] Roland Wenzlhuemer, *Connecting the nineteenth-century world: the telegraph and globalisation* (Cambridge, 2012), pp 8-9.

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Aims

The thesis will seek to advance the understanding of the multitude of interacting social, economic, political, geographic, as well as technological factors that were to shape the development of optical and electrical communications in Ireland. It will do this by tracing the development of three separate technologies: the optical telegraph of R.L. Edgeworth, the electro-magnetic telegraph, and the telephone. Central to the development of these technologies was Ireland's nineteenth-century membership of the United Kingdom. The fact that its partner in this union, and nearest neighbour, was an economic powerhouse was to have a significant impact on the development of these technologies in Ireland. It must be noted that science and technology are also strongly influenced by local factors and, as Peter J. Bowler and Nicholas Whyte have highlighted, this was as true for Ireland as anywhere else.[3] Thus, this thesis seeks to understand how the development of optic, and electric, telegraph and telephone networks were shaped by British national interests and the desire for connections with continental Europe and North America. In addition, alongside these national and international interests, the thesis will demonstrate that the development of these networks was also strongly influenced by regional and local factors.[4]

Structure

This thesis is structured around four research themes, each of which is covered at varying lengths, with its own objectives. These look at optical telegraphy (chapter I), electric telegraphy (chapters II to IV), telephony (chapters V to VI), and

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[3] Peter J. Bowler and Nicholas Whyte, *Science and society in Ireland: the social context of science and technology in Ireland, 1800-1950* (Belfast, 1997), vii.
[4] Erick van der Vleuten, 'Toward a transnational history of technology: meanings, promises, pitfalls' in *Technology and Culture*, xlix, no. 4 (2008), pp 974-94, at pp 974-6.

finally some of the impacts of these technologies (chapter VII to VIII). The first section traces R.L. Edgeworth's optical telegraph from *c.* 1790 to 1805. This telegraph was the only one of these early technologies that was 'invented' in Ireland. This section will enquire into notions of technological 'success' and 'failure'. For his invention to be successful, Edgeworth not only had to fashion uses for his innovation but also convince others that his invention had practical applications. The chapter will seek to understand how broader historical events, in this case heightened military tensions of the 1790s and 1800s, were central to the success and ultimate failure of this technology.

The second part of the thesis focuses on the electric telegraph. It will seek to understand the many interacting economic, social, technological, geographic, and political factors that shaped the development of electric telegraphy. Again, the thesis will demonstrate how the development of telegraph networks in Ireland was shaped by British, regional and local factors.

Chapter II will trace the early development of the electric telegraph and its introduction to Ireland. It will seek to understand the factors that influenced the growth of the electric telegraph network and to understand how perceptions of its importance were to contribute to this growth. In addition, the chapter will seek to understand the impact of geography and technology on the growth of Ireland as a transatlantic communications hub.

Chapter III will focus on the various factors that led to the nationalisation of the United Kingdom's inland telegraphs in 1870. Having demonstrated the motivations of those who pursued nationalisation and the expectations that this process encouraged, the chapter will look at how these expectations were to shape the new telegraph service that was introduced across the British Isles. Chapter IV,

will focus on the implications for Ireland of telegraph nationalisation. It will trace the impact of the new Post Office telegraph standards on the development of Irish telegraphy from 1870 to 1912.

The third part of the thesis will enquire into the development of telephony in Ireland. Chapter V will focus on the early introduction of the telephone to the island. It will seek to understand the strategies that the technology's promoters adopted to drive its success. It will then trace the establishment and development of the Telephone Company of Ireland (TCI), 1882, until it was taken over by the National Telephone Company (NTC), in 1893. Chapter VI will look at the impact of NTC control, until nationalisation in 1912, as well as increasing state regulation and telephone trunk-line nationalisation, from 1896.

The final part of the thesis will explore the impacts of electric communication, primarily the telegraph, on the newspaper industry (chapter VII) and the administration and governance of Ireland (chapter VIII). The dematerialisation of information meant that Irish newspapers were no longer reliant on the physical transportation of information. This had been a serious drawback in their competition with London newspapers which were transported to Ireland and on sale before such information appeared in Irish newspapers. Telegraphy had the potential to revolutionise the organisation and supply of news, thereby, altering the content and type of journalism that was offered. Of particular interest for this thesis is the relationship between the news intelligence-services of the private telegraph companies (and the unified Intelligence Department that the three main private telegraph companies established in 1865). Also of importance was nationalisation and the formation in 1868 of the Press Association (and other news agencies), which took full advantage of the favourable transmission charges of the Post Office.

Given that Ireland was riven by agrarian and political unrest throughout the period of this study,[5] the appeal of optical and electric communication to central government is self-evident. Of particular importance in this regard was the electric telegraph. This afforded rapid communication across the island and to Britain, essential for the Irish administration at Dublin Castle and government at Westminster. Using case studies of the Fenian rebellion, 1867, and the Land War, 1879-82, this thesis will seek to understand how the telegraph became an integral part of the administration and governance of Ireland.

The period of this study is marked at both ends by political tension, starting with increasing Anglo-French tensions in the 1790s which was a catalyst for the rise of optical telegraphy. 1912 marks the height of the crises surrounding the third Home Rule Bill and, internationally, the beginning of events that would culminate in the outbreak of the First World War. There is little doubt that a study of electric communication over the course of the Irish revolutionary period, beginning with the 1913 Lockout, covering the First World War, and ending with the cessation of the civil war, in 1922, would yield significant dividends. But such a study, intertwined as it would have to be with the much larger concerns of nationalism, loyalty, war in Ireland and the Great War itself is deserving of treatment in its own right, and is beyond the scope of this thesis.[6]

It is for similar reasons that a study of wireless telegraphy has been excluded. While the period of the thesis covers the early development of this technology, it would be necessary to extend the study considerably to attempt to understand the

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[5] K. Theodore Hoppen, *Ireland since 1800: conflict and conformity* (1st ed., London, New York, 1989), pp 14-5, 21, 44-50, 52-3.

[6] However, glimpses of the rewards of such a study can be seen in Donard de Cogan, 'Ireland, telecommunications and international politics, 1866-1922' in *History Ireland*, i, no. 2 (1993), pp 34-8; Ben Novick, 'Postal censorship in Ireland, 1914-16' in *IHS*, xxxi, no. 123 (1999), pp 342-57. This work is solely concerned with mail but there are many parallels with the telegraph and telephone networks.

development and impact of this innovation, particularly if its latter incarnation as radio was to be considered. Also of importance to the historiography of communication in Ireland is the Post Office and the extremely cheap, and efficient, mail service that it offered.

1912, besides being seen as the starting date of a tumultuous period in Irish history, is also significant as the United Kingdom's telephone network was nationalised on 1 January 1912. Hence, this study will cover the period of private ownership and nationalisation of both the electric telephone and telegraph. Again, while a study of these technologies in twentieth-century Ireland would provide insights into technological developments in the nascent independent state and its relationship to the United Kingdom, there are significant difficulties with such an undertaking. This study will make use of the extensive material on the development of Irish telegraphy and telephony that is held in the British Telecom Archive, London; these records are primarily concerned with pre-independence Ireland. Most of the records concerning telecommunications in the Irish Free State and the Republic of Ireland were produced and retained in Ireland. These include the records of the government department responsible for telecommunication, Post and Telegraphs (P&T), 1924-84, as well as the Telecom Éireann, 1984-99, and the privatised company Eircom, 1999 onwards. Unfortunately, these records, held by the National Archives of Ireland (NAI), are currently unavailable to researchers (although the ongoing development of the warehouse facilities at the NAI does hold out the promise that they will become available at a future date).

Methodology

This thesis has much new ground to cover. While there is a strong body of literature focusing on the history of telegraphy and, to a slightly lesser extent, telephony, in the nineteenth century, the development of these technologies in Ireland has been largely overlooked. Thus, it would be quite tempting to engage in a study of only one of these technologies but researching a number of these technologies shall allow a greater understanding of the underlying factors that influenced their development. By using a *longue durée* approach, this thesis will attempt to understand the factors that influenced the development, implementation, growth and use of long-distance optic and electric communication technologies over the course of the long nineteenth-century. This will be made possible by restricting the study to Ireland.

The *longue durée* has re-emerged as a powerful historiographical tool in recent years. One of the most prominent publications on this topic has been Jo Guldi and David Armitage's, *The history manifesto*.[7] The authors, while acknowledging the importance of micro-studies, seek to reawaken historians to the importance of 'deep history'. They argue that the move to the short term has seen the replacement of the historian with the sociologist and economist as the arbiter of facts upon which to base public policy.[8] Thus, if history is a form of institutionalised social memory, the study of optic and electric communications over the course of the long nineteenth century offers much for our understanding of past events as well as providing a basis for future decisions.[9] The authors, aware that historians seek to focus on events

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[7] Jo Guldi and David Armitage, *The history manifesto* (Cambridge, 2014).
[8] Guldi and Armitage, *The history manifesto*, pp 1-4, 7-8, 10.
[9] This claim is not without critics who would argue that historians have engaged with long-term history throughout the latter half of the twentieth century, for example see Lynn Hunt's response to their paper in *Annales: Histoire, Sciences Sociales,* lxx, no. 2 (2015).

within the perspective of their own sub-disciplines, challenge them to integrate these into a 'complex but nevertheless singular narrative'.[10]

The History of Science has not been immune to the impact of the *longue durée*. As early as 1993, a special edition of the *British Journal for the History of Science* recognised the need for studies that took account of longer timespans and wider regional and global perspectives.[11] In addition, a recent edition of *ISIS*[12] (the journal of the Society for the History of Science) has dedicated its Viewpoint section to the impact of *The history manifesto* on the History of Science. Contributors highlighted similar concerns about time prevalent in the disciplines of History and History of Science,[13] as well as other factors such as the inclusion of wide geographic studies within the concept of the *longue durée.*[14]

This study relies heavy on a number of theories, from sociologists and historians of technology, which focus on technologies and technological systems/networks. These, which have been collectively called the 'new sociology of technology',[15] are the Social Construction of Technology (SCOT), Actor Network Theory (ANT) and Large-Scale Technological Systems (LTS). While the last of these, (LTS), is of greatest concern for a study that focuses on the development of optic and electric communication technologies in a peripheral region of the United Kingdom,[16] this study also acknowledges that technological systems are a construct

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[10] Guldi and Armitage, *The history manifesto*, p. 60; Noortje Jacobs 'Summary of *The history Manifesto*' in *ISIS*, cvii, no. 2 (2016), pp 311-4.

[11] J.A. Secord, 'Introduction' in *The British Journal for the History of Science,* xxvi, no. 4, The Big Picture (Dec., 1993), pp 387-9, at p. 387.

[12] *ISIS*, cvii, no. 2 (2016).

[13] Antonella Romano, '*The history manifesto,* History of Science, and big narratives: some pending questions' in *ISIS*, cvii, no. 2 (2016), pp 338-40.

[14] Stephen Gaukroger, 'Undercontextualization and overcontectualization in the History of Science' in *ISIS*, cvii, no. 2 (2016), pp 340-2.

[15] Deborah G. Douglas, 'Preface to anniversary edition', in Wiebe E. Bijker, Thomas P. Hughes and Trevor Pinch (eds), *Social construction of technological system: new directions in the sociology and history of technology* (Cambridge, MA., London, 2012), xi-xxxiv, at xiv.

[16] For example see, Thomas P. Hughes, *Networks of Power: electrification in western society* (Baltimore, London, 1988).

of society (SCOT). This means that technological systems are produced by the social, economic, cultural and political contexts in which they developed. Added to this, the thesis borrows from ANT in stating that technology is a non-human actor in this development, that is to say that technology has agency. This combination has been termed a 'post-humanist'[17] approach to the social theory of technology and can be seen as an attempt to draw on these multiple approaches to understanding the historical narrative that is presented by empirical research. Thus, while these theories can be useful, as a product of historical enquiry this thesis shall seek to balance the insight provided by these theories with the historical record.

While each of these theories has its own particular focus, the underlining thrust is that the development of technology and technological systems must be understood not as a narrative of heroic inventors and engineers overcoming all the odds to transform society but rather that these technologies and systems were part of a much larger social context that shaped and was shaped by technological innovation and development.[18]

As this is a historical rather than a sociological treatment of the subject, it is necessary to recognise the strengths of both disciplines. While the sociological theories outlined above provide a framework within which to investigate the development of telecommunication technologies in nineteenth-century Ireland, such theories cannot encompass the whole of human experience. While many would argue that the discipline of history has a rather underdeveloped set of theoretical frameworks to apply to such a study as this, the discipline also has many strengths. Central to the historical method is the vast amount of empirical data that historians weigh in the production of a nuanced narrative.

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[17] Steve Matthewman, *Technology and social theory* (Basingstoke, 2011), pp 15, 18-9, 152, 164-9, 172-6.

[18] Douglas, 'Preface to anniversary edition', xvii-xviii.

All technology as well as enabling certain actions, such as in this study the rapid transmission of intelligence, also has limitations, for example induction on early telephone lines limited the distances over which they could operate efficiently. In addition, one must not forget that the infrastructure of these technologies was constructed in a physical landscape. This combined with any of the factors above could retard the development of such networked systems, for example early difficulties in the construction of submarine cables meant that the Irish Sea acted as a fixation line—to borrow a Conzenian term—[19]to the development of a British Isles telegraph, and subsequently telephone, network. Therefore, as well as economic, social, cultural and political factors, a study of this kind must take into account the impact that technology itself had on the shaping of telecommunication networks. The final part of the thesis, which focuses on the impact of technology, can be placed within more recent developments in SCOT that see technology and society as being co-constructed.[20] Thus, technological developments are not only shaped by society but in turn these technologies shape the societies into which they are introduced.

Primary sources

Given the extensive time period and the broad objectives of this study, it draws on a wide range of sources, including family papers, the records of the various private telegraph and telephone companies and the papers created by the Post Office during the period of its control of telegraphy. It shall also utilise parliamentary papers, newspapers, contemporary publications and government papers that demonstrate the

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[19] M.R.G. Conzen, 'Alnwick, Northumberland: a study in town-plan analysis' in *Transactions and papers (Institute of British Geographers)*, no. 27 (1960), pp 3-122, at pp 40, 58; Jeremy W.R. Whitehand, 'Conzenian urban morphology and urban landscapes' in Proceedings, 6th International Space Syntax Symposium, Istanbul, 2007, p. ii-03.
[20] Douglas, 'Preface to anniversary edition', xxii; W. E. Bijker, T.P. Hughes, Trevor Pinch (eds), *The social construction of technological systems* (Cambridge, MA, 1989).

uses to which the technologies were put. Family papers utilised include the voluminous Edgeworth papers,[21] as well as papers by R.L. Edgeworth that are directly related to his optical telegraph.[22] In addition, the chapter on optical telegraphy will make use of Edgeworth's published works on the topic.[23] A central apprehension in using these materials is the knowledge that Edgeworth was deeply concerned with the promotion of his invention and saw his scientific and technological pursuits as an intricate part of his own self-fashioning as a gentleman. It is essential that these facts are taken into account by the historian. Other family papers will be utilised, including the Foster Papers. [24]

Extensive use will be made of the records of multiple private telegraph companies from the period prior to nationalisation including the English and Irish Magnetic Telegraph Company (E&I MTC), which was the main provider of telegraphy in Ireland prior to nationalisation, and the Electric Telegraph Company, the other telegraph provider on the island. In addition, the records of the National Telephone Company (NTC) will also be used.[25] The vast array of material generated

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[21] Edgeworth Papers (NLI, Mss 10,166/7 & 11,132).
[22] Telegraph code by R.L. Edgeworth, with the heading, vocabulary complete, late 18th cent. (NLI, Ms. 7393); Miscellaneous manuscripts relating to telegraphs, topmasts, fire balloons and kite for communication from the Edgeworth family papers (NLI, MS 45,020 (1-5)); Papers of R. L. Edgeworth relating to the Telegraph system, drafts and copies of letters by Edgeworth, letters to Edgeworth from Littlehales in Dublin Castle, rules and orders, staff, estimates, etc., 1803-11 (NLI, MS 8182).
[23] R.L. Edgeworth, *A letter to the right hon. the Earl of Charlemont, on the tellograph and on the defence of Ireland* (Dublin, 1797); Richard Lovell Edgeworth, 'Supplement to Mr Edgeworth's essay upon the telegraph', *The Transactions of the Royal Irish Academy,* vi (1797), pp 313-7; Richard Edgeworth and Maria Edgeworth *Memoirs of Richard Lovell Edgeworth, Esq.* (2 vols, London, 1820); R.L. Edgeworth, 'An essay on the art of conveying secret and swift intelligence' in *The Transactions of the Royal Irish Academy,* vi (1797), pp 95-139.
[24] Foster Papers (PRONI, D207); Hardwicke Papers (BL, Ms. 35768, 35755); Larcom Papers (NLI, Ms. 7583).
[25] These two companies were to become the British and Irish Magnetic Telegraph Company and the International and Electric Telegraph Company before they were nationalised in 1870. The records of these two companies are held at the BT archives, see bibliography.

by the Post Office relating to the telegraph and telephone, including maps, letters, reports, charts, and minute books will also be utilised.[26]

Parliamentary papers provide an excellent overview of government efforts to regulate, nationalise and operate telegraphs and telephones and are extensively used in this thesis. However, as they are generally concerned with the whole of the United Kingdom, information specific to Ireland is sparse. Contemporary newspapers shall be utilised in two ways to provide information for example in relation to the Telephone Company of Ireland (TCI), of which little is known outside of what can be gleaned from the *Irish Times*. As the thesis is concerned with the changes that telegraphy brought to the news industry, newspapers are also an object of study in their own right. An array of contemporary publications will also be utilised to provide information on and insights into how these new technologies were promoted to the public and how they were received in mercantile and scientific circles.[27]

Another area where limited sources present difficulties is in attempting to understand the impact, and uses, of telecommunications in the governance and administration of Ireland. There was initially much averseness to their use; obviously doubts as to their practicality and the conservatism that exists in state bureaucracies to technological innovation were barriers. Importantly, as has been highlighted by Valerie Johnston in her study of telephone use, government departments were reluctant to adopt the technology as it did not provide a documentary record of

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[26] For a full list of the sources used see bibliography.

[27] For example, The National Telephone Company Limited, Reprint of special articles on the telephone service which appeared in "The Times," Dated 20th, 23rd and 24th January, 1899 (London, 1899) (BL, General Reference Collection 8761.a.70).

conversations.[28] This extended to the business community where managers preferred face-to-face communication, leaving subordinates to deal with the telephone.[29]

The dearth of written records compounds the historian's difficulties in constructing an argument as to the technologies' uses. These difficulties with the study of the telephone can be extended to the telegraph. The relative high costs of telegrams, in comparison to the post, meant that brevity was prized in their wording. As such their usefulness, in comparison to the letter or official report, was short lived and, as ephemeral objects, telegrams held little worth beyond their immediate purpose. Unlike official reports which were retained as '"memorial" of transactions or social events', the telegram held no such long-term value. Thus, records with which to study telegraph use, as with the telephone, suffers from a 'bias of preservation'.[30]

The methodology of archiving did not advance the retention of telegrams. The archive as it evolved over the eighteenth and nineteenth centuries became a site where the authority of the state and the historical records of the nation were stored. Ideally, all records were retained but in reality chance often had a role to play in this process. As the focus of archives was to retain records with which historians could produce an 'accurate' record of the history of the nation, subordinate topics such as social history or the history of technology was not the primary focus of archivists. An added difficulty for historians of Irish history is the multiple, overlapping administrative responsibility that existed. Often departments in London and Dublin were responsible for the same activity and responsibility for many functions of state

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[28] Valerie Johnson, 'Plus ca change…? The salutary tale of the telephone and its implications for archival thinking about the digital revolution' in *Journal of the Society of Archivists*, xxxii, no. 1 (April, 2011), pp 79-92, at pp 81-3.

[29] G. J. Milne, 'British business and the telephone, 1878-1911' in *Business History*, il, no. 2 (2007), pp 163-85, at p. 178.

[30] Francis X. Blouin and William G. Rosenberg, *Processing the past: contesting authority in history and the archives* (Oxford, 2011), p. 17. The author is grateful to Prof. Raymond Gillespie, Maynooth University, for his insights into this concept.

did move between these administrative centres over the course of the nineteenth and early twentieth centuries.

An example of the difficulties facing those researching Irish history is the records of Ireland's military barracks. While the bulk of these records can be found in the War Office files in the National Archives (U.K.), there are also substantial records relating to this topic in the Office of Public Works records in the National Archives of Ireland (due to the transfer of military barracks to police use). Thus, in this case responsibility for barracks was moved from London to Dublin.[31]

Due to the relative lack of documentation, traditional 'scientific' historical methodology would state that our ability to understand the role of telegraphy in the administration of various state agencies was limited. But it is important to remember that the archive is a collection of what contemporaries thought should be retained. Consequently, the sparsity of telegrams in the official archives points not to a lack of use or importance but rather to an archival culture that placed little value on telegrams as arbiters of historical record. As such, the task facing the historian is the construction of an historical narrative based on the evidence at hand.[32] Sufficient material has survived with which to construct a broader narrative of various events and the contribution that telegraphy made to them. Finally, while difficult, such research can be quite rewarding, allowing an insight into the broad social, political and economic changes that these technologies brought.

Finally, the thesis shall make use of an array of departmental records to understand the state's role in the regulation, nationalisation and operation of optic and electric communication. In addition, these sources throw light on the role that

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[31] Jacinta Prunty, 'Military barracks and mapping' in H.B. Clarke, Jacinta Prunty & Mark Hennessy (eds), *Surveying Ireland's past: multidisciplinary essays in honour of Anngret Simms* (Dublin, 2004), pp 478-83, 487-9, 512-3.
[32] Blouin and Rosenberg, *Processing the past*, pp 6-8, 14-6, 34.

these technologies came to play in the administration and governance of Ireland. [33]

These include the Home Office 100 series[34] and the papers of the chief secretary's

office[35]

Literature review

There is a large body of international scholarship on optical and electric

telegraphy, and telephony. Of particular importance to this study is the literature

concerned with the development, implementation and growth of these technologies

in Britain over the course of the long nineteenth century. While Ireland and Britain

were in a political union for most of this period these studies have, for the most part,

disregarded the development and use of these technologies in Ireland. Thus, in

addition to providing the first survey of telecommunications in Ireland over the

course of the long nineteenth century, this thesis shall, by contributing to and

engaging with these British studies, complete the narrative of these technologies'

development and implementation across the United Kingdom in this period.

There have been some useful surveys of optical telegraphy; however, the

subject is under-researched in comparison to the later electric telegraph. While

optical telegraphy is mentioned in a number of broad studies of telegraphy, in the

main the technology is treated as a novelty rather than considered within the broader

historical context in which it was invented, promoted and implemented. There are,

however, a number of useful studies of optical telegraphy, most of which focus on

the development of the Chappe optical telegraph in France. They provide brief

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[33] For example, Minute book of the Athy Town Commissioners (NLI, Pos 8127); Lough Foyle:
British and Irish Magnetic Telegraph company cable (TNA, CRES 58/1066).
[34] Home Office 100 series (TNA, HO 100).
[35] Papers of the Chief Secretary's Office (NAI, OP); Register papers of the chief secretary's office
(NAI, CSORP).

overviews of similar inventions in other countries, although the Admiralty's optical telegraph along the south of England does receive some detailed attention.[36]

In the case of R.L. Edgeworth's optical telegraph, or tellograph as he called his invention, there has been little scholarly research. Geoffrey Wilson's *The old telegraphs*[37] contains a chapter on Edgeworth's tellograph. It provides a solid survey of the technology's development, but does not seek to understand the interaction between inventor, state and military, and the pursuit of patronage that was essential to the eventual adoption of the telegraph in Ireland. Similarly, D.J. Clarke's biography of Edgeworth, while a useful account of his efforts to establish a telegraph line, gives little background to Edgeworth's efforts to secure support for this technology.[38] Ben Marsden and Crosbie Smith's, *Engineering empires*, is a seminal work that has added much to our understanding of the strategies that inventors and promoters adopted to shape uses for their inventions, and for themselves as authorities on these new innovations. Such efforts are intricately tied to notions of technological success and failure. This has become a popular topic of research amongst historians of technology. Graeme Gooday has highlighted the difficulties in establishing criteria with which to judge 'success', while Ben Marsden has emphasised that success or failure is as much a matter of context as judgement.[39]

Hence, this chapter of the thesis, as well as providing a study of this little know invention, will demonstrate that technological success and failure was

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[36] For example Geoffrey Wilson, *The old telegraphs* (London, Chichester, 1976), pp 120-52; G. J. Holzmann and Bjorn Pehrson, *The early history of data networks* (Los Alamitos, 1995); Howard Mallinson, *Send it by semaphore: the old telegraph during the wars with France* (Crowood, 2005); Frank Hellemans, 'Napoleon and internet: a historical and anthropological view on the culture of punctuality and instantaneity', *Telematics and Informatics*, xv, no. 3 (1998), pp 127-33.
[37] Wilson, *The old telegraphs*.
[38] D.J. Clarke, *The ingenious Mr Edgeworth* (London, 1965).
[39] Graeme Gooday, 'Re-writing the "book of blots": critical reflections on histories of technological "failure"', in *History and Technology*, xiv (1998), pp 265-91; Ben Marsden, 'Blowing hot and cold: reports and retorts on the status of the air-engine as success or failure, 1830-1855' in *History of Science*, xxxvi (1998), pp 373-420.

influenced as much by social factors as by any inherent superiority in engineering. In doing so it will contribute much to our understanding of the development of technologies and technological systems in Ireland by demonstrating that these were uniquely shaped by Irish economic, political and social considerations. It is hoped that this will open new avenues of enquiry for researchers of technology in Ireland, allowing them to move past the standard narrative of the heroic inventor.

By comparison with optical telegraphy, there is a much larger body of scholarship on the electric telegraph. There have been a number of broad surveys, ranging from popular non-scholarly books,[40] to more technical studies of the technology.[41] A central study of the development of the telegraph in nineteenth-century Britain is Jeffrey L. Kieve, *The electric telegraph: a social and economic history*.[42] This monograph provides much detail about the development and use of the telegraph. C.R. Perry's early article on the introduction of the telephone to the United Kingdom, and the delay in its adoption as a tool for person-to-person communication, has been criticised for underplaying the development of British telephony compared with the United States. [43] However, his book *The Victorian Post Office* (and a later article on government telegraphy in Britain)[44] provides an important overview of the increasing role of the state in the provision of, firstly, telegraphy and then telephony, as well as the motivations for these developments.

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[40] For an example of this genre see Tom Standage, *The Victorian internet: the remarkable story of the telegraph and the nineteenth century's on-line pioneers* (New York, 1998).
[41] For example, K.G. Beauchamp, *The history of telegraphy* (London, 2008).
[42] Jeffrey L. Kieve, *The electric telegraph: a social and economic history* (Newton Abbot, 1973); in a similar vein is Simone Fari, *Victorian telegraphy before nationalization* (Basingstoke, 2015).
[43] C.R. Perry, 'The British experience 1876-1912: the impact of the telephone during the years of delay' in Ithiel de Sola Pool (ed.), *The social impact of the telephone* (Cambridge, Mass.,1977), pp 69-96.
[44] C. R. Perry, *The Victorian Post Office: the growth of a bureaucracy* (London, 1992); C. R. Perry, 'The rise and fall of government telegraphy in Britain' in *Business and Economic History*, xxvi, no. 2 (1997), pp 416-25.

There are a number of other books on the general history of the Post Office useful to this study.[45]

This thesis will make use of wider studies of telegraphy that have enquired into various aspects of the technology's invention and development, and its role in regulating society.[46] There is also an extensive literature on international telegraphy and cable networks.[47] For those seeking to understand the social impacts of telegraphy, there have been particularly important contributions by Daniel Headrick, D.P. Nickles and others.[48] Especially useful to this study are those works which have sought to understand the importance of exhibition in promoting new technologies. I.R. Morus's work on various aspects of telegraphy has also contributed to a better understanding of telegraphy and its interaction with society.[49] The use of these to contextualise the history of telecommunications in Ireland will broaden the methodological and theoretical approach that has been traditionally applied to studies of Irish technologies. This will allow historians to move past narratives of technological development and implementation to an understanding of what factors shaped these developments.

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[45] For example, Anon, *The Post Office, an historical summary* (London, 1911); Duncan Campbell-Smith, *Master of the Post: the authorised history of the Royal Mail* (London, 2011); T.E. Herbert, *Telegraphy: a detailed exposition of the telegraph system of the British Post Office* (London, 1906).

[46] For example, Iwan Rhys Morus, 'The nervous system of Britain": space, time and the electric telegraph in the Victorian age', *British Journal for the History of Science*, xxxiii, no. 4 (2000), pp 455-76.

[47] For recent examples see Wenzlhuemer, *Connecting the nineteenth-century world*; R.M. Pike and Dwayne Winseck, *Communication and empire: media, markets, and globalization, 1860-1930* (Durham, 2007); Bernard S. Finn & Daqing Yang, *Communications under the seas: the evolving cable network and its implications* (Cambridge MA, 2009); Daniel R. Headrick and Pascal Griset, 'Submarine telegraph cables: business and politics, 1838-1939' in *The Business History Review*, lxxv, no. 3 (2001), pp 543-78.

[48] D.R. Headrick, *The tools of empire: technology and European imperialism in the nineteenth century* (Oxford, 1981); D.R. Headrick, *The invisible weapon: telecommunications and national politics, 1851-1945* (Oxford, 1991); D.R. Headrick, *When information came of age: technologies of knowledge in the age of reason and revolution, 1700-1850* (Oxford, 2000); D.P. Nickles, *Under the wire: how the telegraph changed diplomacy* (Cambridge, 2003).

[49] I.R. Morus, 'The electric Ariel: telegraphy and commercial culture in early Victorian England' in *Victorian Studies*, xxxix, no. 3, (1996), pp 339-78; Ben Marsden and Crosbie Smith, *Engineering empires: a cultural history of technology in nineteenth-century Britain* (Basingstoke, 2004).

The telephone has not received as much attention from historians as the electric telegraph. An early work on the development of the telephone is F.G.C. Baldwin's *The history of the Telephone in the United Kingdom* (London, 1925). The author's primary concern was to produce a technical history of the telephone's implementation and development in the United Kingdom. It contains much valuable information on the early telephone and the companies that implemented it up to nationalisation, in 1912. Unfortunately, the book is largely limited to events in Britain, for example its coverage of the Telephone Company of Ireland—the focus of chapter V of this thesis—runs to four lines.[50] As noted already, there is a dearth of published work focusing on telephony in Ireland. These publications provide some information on the early development of telephone networks in Ireland but are in no way comprehensive, nor do they seek to interpret the factors that influenced these developments.[51]

There have been a number of unpublished theses and other works on the history of the electric telegraph and telephone. Roger Barton's thesis focuses primarily on the E&I MTC and the B&I MTC. Due to this it covers some of the company's activities in Ireland but its primary focus is Britain.[52] Despite being restricted to England Raymond Feuerstein's thesis on the early development of the telephone does concern itself with the introduction, marketing and nationalisation of

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[50] F.G.C. Baldwin, *The history of the telephone in the United Kingdom* (London, 1925), p. 150.
[51] A.J. Litton, 'The growth and development of the Irish telephone system' in *Journal of the Social and Statistical Inquiry Society of Ireland*, xx, part v (1961), pp 79-115; see also J.W. O'Neill, 'The telephone system of Eire', in .*Journal of the Institution of Electrical Engineers*, lxxxiv, no. 505 (1939), which primarily looks at the telephone in the Irish Free State.
[52] Roger Neil Barton, 'Construction of the network society: evolution of the electric telegraph 1837-1869' (Ph.D. thesis, Department of Science and Technology Studies, UCL, 2007).

the telephone and is, thus, of use to understanding how the wider British Isles context affected the development of the telephone in Ireland. [53]

However, all these texts provide little information on the situation in Ireland. The island's unique economic, political, geographic and demographic situation meant that development of these technologies would take a different course to that of Britain. Ireland is rarely mentioned in these texts, and when it is it is only in passing so that there is still no in-depth study of the development of telegraphy in Ireland.

Alfred Kay's thesis focuses on the impact that users and non-users had on the development of telephone exchanges in Britain. In this thesis and an article, 'Troublesome telephony: how users and non-users shaped the development of early British exchange telephony,' Kay argues that users played an important role in the shaping of early telephone technology and systems as the telephone companies sought to encourage as many subscribers as possible by attempting to solve the reasons for non-subscription. Kay also identifies the role that non-users had in restricting the telephone companies' ability to expand their networks.[54] Unfortunately, within these studies, coverage of Ireland is extremely limited.

Unpublished works that focus on the development of telegraphy and telephony in Ireland includes Thomas Wall's 'Some notes towards a history of telecommunications with particular reference to Ireland'. While this paper provides a great deal of technical detail about early telecommunications, as the author states himself 'these notes do not purport to be a comprehensive history of

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[53] R.J. Feuerstein, 'The early history of the telephone in England 1877-1911' (D.Phil. thesis, University of Sussex, 1989).
[54] M.A. Kay, 'Inventing telephone usage: debating ownership, entitlement and purpose in early British telephony' (Ph.D. thesis, School of Philosophy, Religion and History of Science, University of Leeds, 2014); Michael Kay, 'Troublesome telephony: how users and non-users shaped the development of early British exchange telephony' in *Science Museum Group Journal*, iii (2015) (http://dx.doi.org/10.15180/150308) (11 Oct. 2016).
For a further insight into the role of users and technology see Carolyn Marvin, *When old technologies were new: thinking about electric communication in the late nineteenth century* (Oxford, 1988).

telecommunications in Ireland, but rather were compiled to act as a starting point for the student of the subject'. It does not explore the wider implications of the technology on society or the social shaping that society had upon the development of the technology in Ireland. While the paper provides information on the development of telecommunication networks in Ireland, it fails to incorporate the material held in the BT archive.[55]

The other significant unpublished work in relation to telegraphy and telephony in nineteenth-century Ireland is Frank Cullen's PhD thesis, 'Local government and the management of urban space: a comparative study of Belfast and Dublin, 1830-1922', which dedicates a chapter to telegraphy and one to telephony.[56] The bulk of the work deals with the take-over of the telegraphic network by the Post Office, 1868-70 and the subsequent improvements to the telegraphic networks of Dublin and Belfast. The thesis also focuses on the early development of the telephone and shows the role it played in the administration of these cities, with the fire services, police stations, as well as important municipal offices being connected by telephone in these early years. The thesis also gives an overview of the performance of the National Telephone Company, 1893-1912 (when it was nationalised). Cullen explores similar themes in a book chapter based on his thesis.[57] Finally, Roddy Flynn's thesis on the rise of universal service in the telephone industry, very briefly traces the early development of telephony in Ireland.[58]

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[55] Thomas Wall, 'Some notes towards a history of telecommunications with particular reference to Ireland' Unpublished paper, 2005 (NLI, call no. 5B 180).

[56] F.J. Cullen, 'Local government and the management of urban space: a comparative study of Belfast and Dublin, 1830-1922' (Ph.D. thesis in History, Department of History, NUI Maynooth, 2005).

[57] Frank Cullen, 'Harbour, rail and telegraph: the Post Office and communication in nineteenth-century Dublin' in Neven Budak (ed.), *Towns and communication, volume 1, communication in towns* (Zagreb, 2009), pp 171-94.

[58] Roddy Flynn, 'The development of universal telephone service in Ireland, 1880-1993' (Ph.D. thesis, School of Communication, DCU, 1998).

In comparison to the literature on the development and growth of telegraphy and telephony, there is far less on the uses to which these technologies were put. This is particularly true for Irish historiography, where the history of technology has much to contribute not only to our understanding of technological development but also to our understanding of wider changes in Irish society. For example, the impact of the telegraph on newspapers in Ireland is little understood. L.M. Cullen's article, 'Establishing a communication system',[59] provide some insight into the effect of telegraphy in combating the infiltration of British newspapers in Ireland. Christopher Morash's work on the acceleration of news that the telegraph brought is also of relevance.[60] However, it largely overlooks the companies that supplied this news and the organisation, and restrictions, of this service. This thesis will make a significant contribution to our understanding of how technological and administrative developments within the telegraph companies were to shape the organisation and nature of news gathering and reporting from the nineteenth century onward. The limited texts on Irish newspapers will be supplemented by more extensive studies of the press in England.[61]

The thesis will draw on a range of texts that can be drawn upon to help understand the political, economic, administrative and social context that these technologies were shaped by and helped to shape.[62] Added to this the role of the

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[59] L.M. Cullen, 'Establishing a communication system: news, port and transport' in Brian Farrell (ed.) *Communications and community in Ireland* (Dublin, Cork, 1984), pp 18-29.

[60] Christopher Morash, *A history of the media in Ireland* (Cambridge, 2010); Christopher Morash, 'Ghosts and wires: the telegraph and Irish space' in Karen Steele and Michael de Nie (eds), *Ireland and the New Journalism* (Basingstoke, New York, 2014), pp 21-34.

[61] For example, A.J. Lee, *The origins of the popular press in England, 1855-1914* (London, 1976); James Curran and Pauline Wingate (eds), *Newspaper history: from the 17th century to the present day* (Beverly Hills, 1978); George Scott, *Reporter anonymous, the story of the Press Association* (London, 1968).

[62] R.B. McDowell, 'Administration and the public services, 1800-1870' in *A new history of Ireland, Ireland under the Union, 1801-1870* (Oxford, 1989), v, pp 538-61; Brian Jenkins, *Era of emancipation: British government of Ireland, 1812-1830* (Kingston and Montreal, 1988); R.B. McDowell, *The Irish administration, 1801-1914* (London, 1976); Stanley H. Palmer, *Police and protest in England and Ireland, 1790-1850* (Cambridge, 1990); Galen Broeker, *Rural disorder and*

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rapid mail service offered by the Post Office is essential for our understanding of the

nature of telegraph and telephone use. While the effect of this on the development of

the electric telegraph is broached at a number of points in this thesis, there is a dearth

of scholarly research on the impact of this organisation on nineteenth-century

Ireland.[63]

In addition to filling gaps in the historiography of telegraphy and telephony,

this thesis will make a contribution to a broader body of scholarship focused on the

History of Science and Technology in Ireland. While limited in comparison to other

sub-disciplines such as political and social history, this existing literature does

provide much understanding of the role that science and technology played in Irish

history and the insights that can be provided by such studies. These studies have

addressed a range of subjects including the biographies and inventions of scientists

and inventors;[64] the practice of science as a cultural activity, with a strong focus on

religion and science;[65] and the place Irish knowledge occupied within a wider

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police reform in Ireland, 1812-36 (London, Toronto, 1970); Rosemary Fennell (ed.), Thomas Fennell, *The Royal Irish Constabulary: a history and personal memoir* (Dublin, 2003); B.J. Griffin, 'The Irish police, 1836-1914: a social history' (PhD thesis, Department of History, Loyola University of Chicago, 1991); Séamus Breathnach, *The Irish police: from earliest times to the present day* (Dublin, 1974).

[63] An example, albeit outside the time period of this work, of the importance of the role of the Post Office in Irish society can be found in Anthony Hughes, 'Post Office in Ireland, 1638-1840' (Ph.D. thesis, Department of History, Maynooth University, 2016).

[64] For example see Charles Mollan (ed.), *William Parsons, 3rd Earl of Rosse: astronomy and the castle in nineteenth-century Ireland* (Manchester, 2014); Fiacre Ó Cairbre, 'William Rowan Hamilton; Ireland's liberator of algebra' in *History Ireland,* xxiii, no. 5 (2015) pp 20-2.

[65] D.A. Finnegan and J.J. Wright, 'Catholics, science and civic culture in Victorian Belfast, in *The British Journal for the History of Science,* xlviii, no. 2 (2015), pp 261-87; Macdara Dwyer, 'Sir Isaac Newton's enlightened chronology and inter-denominational discourse in eighteenth-century Ireland' in *Irish Historical Studies,* xxxix, no. 154 (2014), pp 210-29; Allan Blackstock, *Science, politics and society in early-nineteenth-century Ireland : the Reverend William Richardson* (Manchester, 2013); D.A. Finnegan, 'Daniel William Cahill (1796-1864) and the rhetorical geography of science and religion' in Joe Kember, John Plunkett, J.A. Sullivan (eds), *Popular exhibitions, science and showmanship, 1840-1910* (London, 2012), pp 97-114; *Don O'Leary, Irish Catholicism and science: from 'Godless colleges' to the 'Celtic Tiger'* (Cork, 2012); Elizabeth Newswald, 'Science, sociability and the improvement of Ireland : the Galway Mechanics' Institute, 1826-51' in *The British Journal for the History of Science,* xxxix, no. 4 (2006), pp 503-34; Elizabeth Newswald, '"The Benefits of a Mechanics' Institute and the Blessing of Temperance"' Science and Temperance in 1840s Ireland' in *Social History of Alcohol and Drugs,* xxii (2008), pp 209-27.

transnational context.[66] There has also been a strong focus on science education, agriculture being an important part of this.[67] Most of these works are either single articles or chapters, or edited editions with an array of subjects;[68] although, there have been some exceptions to this.[69]

For those interested in the historical development of technology, there have been some contributions to this field.[70] Such studies tend to focus on economic factors that surrounded the implementation of technologies. Thus, this thesis will seek to contribute to the wider body of literature on the History of Science and Technology in Ireland by providing a useful set of analytical and methodological tools with which to study the historical development of technology. It will also provide much insight into the factors that influenced technological development and implementation in Ireland over the course of the long-nineteenth century. Added to this, the thesis will address issues that are of concern to historians of Irish newspapers. It will also be of relevance to the history of government, administration, and counter-insurgency in Ireland.

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[66] D.A. Finnegan and J.J. Wright (eds), *Spaces of global knowledge: exhibition, encounter and exchange in an age of empire* (Farnham, 2015).

[67] Juliana Adelman, 'The agriculture diploma in Queen's College, Belfast, 1845-1863, and science education in nineteenth-century Ireland' in *Irish Economic and Social History,* xxxv (2008), pp 51-67; Enda Leaney, 'Missionaries of science : provincial lectures in nineteenth-century Ireland' in *Irish Historical Studies,* xxxic, no. 135 (2005), pp 266-88.

[68] For example, David Attis and Charles Mollan (eds), *Science and Irish culture vol. 1: why the history of science matters in Ireland* (Dublin, 2004); Peter J. Bowler and Nicholas Whyte (eds), 'Science and society in Ireland: the social context of science and technology in Ireland, 1800-1950 (Belfast, 1997).

[69] For example, Julianna Adelman, *Communities of science in nineteenth-century Ireland* (London, 2009); Nicholas Whyte, *Science, colonialism and Ireland* (Cork, 1999).

[70] For example, Juliana Adelman and Éadaoin Agnew (eds), *Science and technology in nineteenth-century Ireland* (Dublin, 2011); Andy Bielenberg (ed.), *Ireland and the industrial revolution: the impact of the industrial revolution on Irish industry, 1801-1922* (London, 2009); Andy Bielenberg (ed.), *The Shannon scheme and the electrification of the Irish Free State* (Dublin, 2002).

Chapter I

R.L. Edgeworth and optical telegraphy in Ireland, *c.* **1790-1805**

> I_____,
> do swear, that I will neither directly nor indirectly endeavour to discover any
> communication, which is intended should be concealed from me, or disclose,
> or permit to be disclosed anything entrusted to me concerning the business of
> the telegraph.
> Oath for the Edgeworth Telegraphic Establishment Corps [1]

Introduction

In 1804 Richard Lovell Edgeworth began transmitting telegraphic messages from

Dublin, on the east coast of Ireland, to Galway, on the west coast. Claims of rapid

transmission speeds appeared in national newspapers and great excitement was

provoked by this marvel of modern science. Its potential as a means of secret

military communication was self-evident. Edgeworth's optical telegraph was but one

of many that appeared in Europe in the period following the French Revolution.

Edgeworth was to fashion his invention as a military communication device; thus,

securing state support was essential for its success. This chapter will seek to

understand the many spheres of influence that inventors had to infiltrate and

persuade in order to secure the patronage needed to implement their inventions. It

will look at the early development of Edgeworth's 'tellograph' and seek to

understand his use of display in its promotion. It will trace the development of

Edgeworth's optical tellograph in the context of a rapidly changing political, and

security, situation in late eighteenth- and early-nineteenth-century Ireland. By

enquiring into the role that political, military, economic and social factors had on the

introduction and failure of this invention.

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[1] Edgeworth to Littlehales [n.d.] (NLI, Ms. 8182/11).

Optical telegraphy

Two early advocates of a communication system which utilised the telescope were John Wilkins and Robert Hooke. By 1684, Hooke, curator of experiments at the Royal Society, was proposing a system which combined a telescope and signalling.[2] Wilkins, a fellow of the Royal Society, in 1694 published *Mercury, or the secret and swift messager, showing how a man may with privacy and speed communicate his thoughts to a friend.* Most of this book was concerned with the secret relaying of coded information in verbal or written form; however, it also dealt with the transmission of information over distance.[3]

R.L. Edgeworth, an inventor and writer, was born in Bath, in 1744, and spent much of his early life in Britain. He was the son of an Anglo-Irish landlord whose family gave their name to the town of Edgeworthstown, Co. Longford. He studied at Trinity College, Dublin; Corpus Christi College, Oxford, and the Middle Temple, London.[4] His interests were wide ranging, including a fascination with the mechanical arts and science. In 1781 he became a member of the Royal Society, of London. More importantly, he also became involved in an informal group of prominent gentleman and industrialists, based in Birmingham, who were interested in applying science to practical uses. Known to posterity as the 'Lunar Society', its members, including Edgeworth, Matthew Boulton, Josiah Wedgewood, Erasmus Darwin, Joseph Priestly and James Watt, were to make significant contributions to Britain's industrial and scientific development.[5]

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[2] Steven Shapin, 'Who was Robert Hooke?', in Michael Hunter and Simon Schaffer (eds), *Robert Hooke: new studies* (Woodbridge, 1989), pp 253-85, at p. 253.

[3] John Henry, 'Wilkins, John (1614–1672)', in Matthew and Harrison (eds) *Oxford dictionary of national biography*, available at (http://www.oxforddnb.com/) (11 Oct. 2016).

[4] Richard Edgeworth and Maria Edgeworth, *Memoirs of Richard Lovell Edgeworth, Esq.* (2 vols, London, 1820), i, pp 21-2.

[5] Desmond Clarke, *The ingenious Mr Edgeworth* (London, 1965), pp 53-4, at p. 100; Jenny Uglow, *The lunar men: the friends who made the future, 1730-1810* (London. 2002), pp ix, xiii-xiv, 124-5, 181-2, 314-6.

In 1782 Edgeworth returned to Ireland to manage his inheritance; despite this, his financial situation while comfortable was not overly prosperous, the main part of his estate was bog land and he had twenty surviving children from several marriages. Upon his return he identified with the patriot volunteers, being appointed one of Lord Charlemont's—the commander-in-chief—aides-de-camp, in 1783. He was noted for his decency in dealing with tenants, both catholic and protestant. In 1798 he was elected to the Irish parliament as M.P. for St Johnstown. He was to vote against the Act of Union; despite being personally in favour he stated that he could not vote for something which the vast majority of the population were against. [6]

According to Edgeworth, he began experimenting with the visual transmission of information over distance in 1767, using knowledge that he had acquired from reading John Wilkins's and Robert Hooke's works.[7] However, while the system was technologically sound, there was little hope of it becoming a practical tool for communication given the cost of erecting and manning such an invention.[8]

Men such as Hooke, Wilkins and Edgeworth saw these experiments as a way of demonstrating the applications of the science of optics.[9] Thus, long-distance communication by visual means was nothing more than a curiosity. Such inventions had no practical market to support the maintenance of a permanent communication system. The creation of such a market was a challenge that faced 'inventors' of electric telegraphs. These inventors and their telegraphs provide an insight into notions of technological success and failure.

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[6] Clarke, *The ingenious Mr Edgeworth,* pp 30, 106-13,172-4; John S. Moore, 'Edgeworth, Richard Lovell' in James McGuire and James Quinn (eds*), Dictionary of Irish biography* (Cambridge, 2009), available at (http://dib.cambridge.org/) (11 Oct. 2016).
[7] Clarke, *The ingenious Mr Edgeworth*, p. 30; Wilson, *The old telegraphs*, p. 103.
[8] Wilson, *The old telegraphs*, p. 103.
[9] Michael Hunter and Simon Schaffer, 'Introduction', in Michael Hunter and Simon Schaffer (eds), *Robert Hooke: new studies* (Woodbridge, 1989), pp 1-19, at pp 5, 7-8, 17-8.

As Graeme Gooday has highlighted, stories of technological success, or failure, are problematic; the central difficulty is establishing criteria with which to judge a technology. The idea that technological success is based purely on quality of design has been discredited; rather, success or failure is as much a social construction as a technological one. Ben Marsden has demonstrated the nuances of these labels during the development and implementation of technologies. Technologies that actually work within the parameters set out by their inventors were, if only for a time, considered successful. However, as the criteria of success changed so too could the technology's status. Therefore, it is important to judge success or failure using the standards of contemporaries.[10] Thus, for the inventors of electric and optical telegraphs long-term success would only be possible with the construction of communication networks. In order to succeed, these inventors issued 'manifestos of promises', fashioning themselves as authority figures and creating the perception of uses that their innovations could satisfy.[11]

Francis Ronalds' telegraph operated using static electricity.[12] In 1816 Rolands approached the Admiralty with a view to replacing its existing optical telegraph system, connecting London to Portsmouth and Plymouth. However, the Admiralty saw no additional benefit in his scheme and, thus, with no users the innovation was never to become financially viable.[13] In contrast, the more widely known electro-magnetic telegraph of Wheatstone and Cook was only successful when they created

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[10] Graeme Gooday, 'Re-writing the "book of blots": critical reflections on histories of technological "failure"' in *History and Technology*, xiv (1998), pp 265-91, at p. 268-71; Ben Marsden, 'Blowing hot and cold: reports and retorts on the status of the air-engine as success or failure, 1830-1855' in *History of Science*, xxxvi (1998), pp 373-420, at pp 411-2.

[11] Marsden and Smith, *Engineering empires: a cultural history of technology in nineteenth-century Britain (Basingstoke, New York, 2005)*, pp 179-80.

[12] Francis Rolands, *Descriptions of an electrical telegraph* (London, 1823), pp 6-8.

[13] Marsden and Smith, *Engineering empires*, pp 186-7.

a market for it initially based on railway safety and management.[14] Hence, the success of Wheatstone and Cooke's telegraph relied on their ability to convince others of its utility, thereby securing the necessary funding to maintain and grow their telegraph system (ch. II).[15]

The cases of Rolands', and Wheatstone and Cooke's, telegraphs demonstrate that it was not simply enough to invent a device for transmitting information rapidly across vast distances. As Lynne Hamill explains 'technology is not exogenous: it does not simply appear and then society adapts to it. Society creates technology and decides if and how to use it.'[16] Consequently, it was essential for an inventor to not only create a new technology but also the perception of a market for it. Hence, the central questions for this study are what conditions were prevalent in the 1800s which saw the uptake of optical telegraphs and why was Edgeworth's telegraph ultimately unsuccessful?

Interest in optical telegraphy

One of the central events in the development of optical telegraphy was the French Revolution. Revolutionary France quickly found itself engaged in open warfare with the conservative monarchies of Europe and, from 1793, Britain. It was thus in the context of heightened political and military tensions that methods of communication over distances by visual means were revisited in a number of countries. In France the designs of Claude Chappe were adopted by the fragile regime, allowing it to communicate rapidly with its military forces and civil administration by overcoming

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[14] I.R. Morus, 'The electric Ariel: telegraphy and commercial culture in early Victorian England', p. 341; see also W. F. Cooke, *Telegraphic railways* (London, 1842).
[15] Marsden and Smith, *Engineering empires*, pp 187-97.
[16] Lynne Hamill, 'The social shaping of British communications networks prior to the First World War', *Historical Social Research,* xxxv, no. 1 (2010), pp 260-86, at p. 261.

the natural barriers of space and time.[17] Chappe's telegraph consisted of a five-metre pole placed on top of a telegraph station with a pivoting four-and-a-half metre bar called a 'regulator' attached. At the each end of this was a rotating two-metre, 'indicator', bar, allowing for 196 possible signals (fig. 1.1).[18] A working system was in place between Paris and Lille by 1794, consisting of fifteen stations and covering 148 miles.[19]
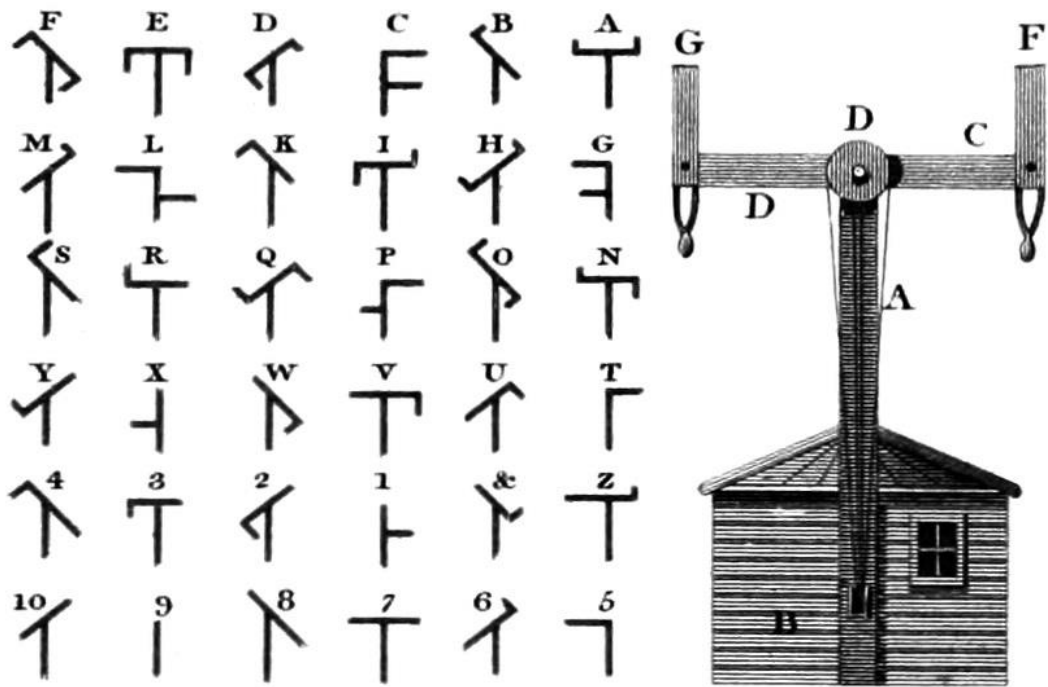
Fig. 1.1 Chappe telegraph
Source: Abraham Rees, *The cyclopaedia; or, Universal dictionary of arts, sciences, and literature* (39 vols, London, 1820), iv, Telegraph plate, fig. 4.

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[17] Hellemans, 'Napoleon and internet', pp 129-31.
[18] Beauchamp, *The history of telegraphy*, p. 6.
[19] J. C. MacKechnie, 'The history of electrical engineering, part 5: the origins of and development of the electric telegraph' in *Journal of the Institution of Electrical Engineers,* ii, no. 15 (1956), pp 130-7, at p. 132.

Following the implementation of Chappe's telegraph in France there was heightened

interest in the technology in Britain and Ireland. Frederick, Duke of York, seeking to

develop a field telegraph for use by the army, had two models and a drawing of the

French telegraph, along with Chappe's alphabet, delivered to his chaplain, Rev. John Gamble.[20] Gamble set to work exploring methods of sending information over great distances, publishing the results in 1795 as *Observations on telegraphic experiments.* The work's purpose was to 'obtain an intelligible figurative language, which may be distinguished at a distance, and by which the obvious delay in the dispatch of orders or information by messenger may be avoided.' Gamble discounted many forms of communication, including the use of electricity; his solution was a five-shutter device (fig. 1.2). These shutters would open and close forming sequences of visual codes

Fig. 1.2 John Gamble's five-shutter telegraph, *c.* 1795
Source: John Gamble, *Observations on telegraphic experiments* (n.p, but probably London, c. 1795).

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[20] Wilson, *The old telegraphs*, p. 11.

which would relate to the alphabet.[21] Resistance to technological innovation by the

Royal Navy was also a feature of this period.[22] In 1796, the Admiralty constructed

the six-shutter system of Lord George Murray. This remarkable system could relay

information from Whitehall to Portsmouth in fifteen minutes.[23]

Optical telegraphs were adopted in many other jurisdictions; however, none

would develop networks as extensive as the French. The main reason was cost:

optical telegraphy was highly labour intensive. Stations were on average not further

than twelve kilometres apart with a staff of five at each.[24] While France, a land-based

power, made extensive use of this technology other countries did not attach the same

importance to telegraphic communication. In Britain, the speedy relaying of

information to the army was not the priority that it was for France; instead the navy,

forming the mainstay of Britain's defence, was the only real candidate for this state-

funded and expensive technology.

Irish telegraphy

Ireland was not immune to the revolutionary impulses that had ignited the French

Revolution. By the early 1790s two radical organisations, the United Irishmen and

the Defenders, were of concern to the government. In 1793 Britain declared war on

revolutionary France and moved to crush the United Irishmen in Ulster.[25] However,

the state was increasingly concerned about an insurrection in Ireland, while it was

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[21] John Gamble, *Observations on telegraphic experiments* ([London], [1795]), pp 5, 10-1.
[22] For an insight into the difficulties facing innovators see Roger Morriss, 'Ideology, authority and the politics of innovation in the Royal Dockyards, 1796-1807' in *Journal for Maritime Research*, xiv, no. 1 (2014), pp 15-27.
[23] Beauchamp, *The history of telegraphy,* pp 4-6.
[24] Ibid, pp 8,17.
[25] Marianne Elliott, *Partners in revolution: the United Irishmen and France* (New Haven, London, 1982), pp 32, 35, 40, 44; Jim Smyth, *The men of no property: Irish radicals and popular politics in the late eighteenth century* (2nd ed., London, New York, 1998), p. 101; Jim Smyth, 'Introduction: the 1798 rebellion in its eighteenth-century contexts' in Jim Smyth (ed.), *Revolution, counter-revolution and union: Ireland in the 1790s* (Cambridge, 2000), pp 1-20, at pp 7-9.

simultaneously at war with France. This anxiety was stoked by the French desire for revenge for British inference in the civil war in Vendée; by 1794 fears of a French landing and indigenous rebellion in Ireland were rife.[26]

Realising the potential utility of a rapid communication system in the defence of Ireland, and conscious of the chance to promote his project, Edgeworth was quick to offer his services to the government. As outlined above, Edgeworth was one of several inventors who realised that the military escalation of the 1790s provided an opportunity to market optical telegraphy as a tool of military communication. In his efforts, Edgeworth was to involve a number of his offspring, in particular his son Lovell and his daughter Maria. Maria Edgeworth, a famous author in her own right, helped to compile a telegraph vocabulary. Due to this and her prolific correspondence, her letters are a valuable source for the study of Edgeworth's 'tellograph' (as he called his invention).

The optical telegraph, as was the case with the electric telegraph, in a sense did not require inventing. All the components of the optical telegraph were already in place, primarily the telescope and mechanical signalling system. Thus, in order to promote his innovation, Edgeworth faced the challenge of not only marketing the utility of optical telegraphy but also of affirming *his* telegraph as *the* telegraph. This was a period when what a telegraph actual consisted of and would be used for was still in flux. Consequently, the field was open to inventors to shape public perception of the technology and its uses.

To achieve these two goals Edgeworth attempted to demonstrate a priority of invention and a viable use for his tellograph, while also manifesting his credentials as a gentleman of science. The ideal natural philosopher was an independent,

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[26] Elliott, *Partners in revolution*, pp 16, 35, 42, 48-50, 53, 57, 66-7.

Christian gentleman, who would report his observations without bias.[27] Edgeworth's claim to have experimented with optical telegraphy in the 1760s highlighted a priority of invention, and helped his efforts to demonstrate his credentials and authority in the field. This was important, particularly as he did not hold a patent for the tellograph. There are a number of potential reasons for this; in the seventeenth century the 'patentee' was viewed in the same light as the fraudster. Projectors committing much industrial and technical fraud were excluded from polite society. Natural philosophers who had become involved in the plans of projectors were criticised. The patent granted monopolistic rights which could be used to exclude others from profitable use of the technology and in turn had an impact on the reputation of the patentee. Thus, patenting would have conflicted with Edgeworth's efforts to create a persona of himself as a gentleman, a patriot and a natural philosopher, who was disinterested in personal gain.[28]

Edgeworth was careful to present himself as uninterested in personal advancement or glory. In 1797, he wrote that he did 'not pretend to say that the means of Tellographic communication which I have invented are the best that can be devised.' He freely admitted that variations and imitations of his invention were possible, and perhaps even to be welcomed. By focusing on his desire to endorse the art of telegraphy before his own invention he was assuming the persona of a gentlemanly patriot whose motivation was the improvement of national security

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[27] Steven Shapin, *A social history of truth: civility and science in seventeenth-century England* (Chicago, 1994), pp 81-6, 156-70; see also, Mario Biagioli, *Galileo, courtier: the practice of science in the culture of absolutism* (Chicago, London, 1993), particularly chapter 1, 'Galileo's self-fashioning', pp 11-102.
[28] Larry Stewart, *The rise of public science: rhetoric, technology, and natural philosophy in Newtonian Britain, 1660-1750* (Cambridge, 1992), pp 29, 260-2, 265-71; Christine McLeod, *Inventing the industrial revolution: the English patent system, 1660-1800* (Cambridge, 1988), pp 202-4; Christine McLeod, *Heroes of Invention: technology, liberalism and British identity, 1750-1914* (Cambridge, 2007), p. 8; Stathis Arapostathis and Graeme Gooday, *Patently contestable: electrical technologies and inventor identities on trial in Britain* (Cambridge, Massachusetts, London, 2013), pp 6-7.

rather than his own position.[29] In reality, while seeking to present a façade of indifference, Edgeworth assiduously promoted his invention. His powers and will for self-promotion were seen when he undertook to write his memoirs, hoping to use it to secure his 'posthumous fame'.[30]

In order to promote his invention Edgeworth staged many exhibitions in the mid-1790s, with such displays serving multiple purposes. Firstly, they engaged a broad audience, which potentially included influential nobles, politicians and military figures. Secondly, they afforded Edgeworth an opportunity to prove the practicality of his invention. By the end of the eighteenth century, demonstration had become an important part of legitimising the work of natural philosophers. The use of exhibitions to promote inventions was a tactic employed by many inventors in this period. Edgeworth's friends James Watt and Josiah Wedgewood had used exhibitions to great effect in promoting their own industrial innovations.[31] These displays played into increased public interest in scientific experiments.[32]

Display also helped to address the debate as to which was more useful: the theoretical designs of the natural philosopher or the practical devices of the artisan or mechanic. Mechanics, with a basic understanding of physical laws, were often able to construct useful devices. Consequently, by displaying his invention in operation Edgeworth was able to counter any claims that it was just a theoretical fancy.[33] This

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[29] R.L. Edgeworth, 'An essay on the art of conveying secret and swift intelligence' in *The Transactions of the Royal Irish Academy,* vi (1797), pp 95-139, at p. 138.
[30] R.L. Edgeworth to John Foster, 10 June 1817 (PRONI, D207/36/84).
[31] See, Marsden and Smith, *Engineering empires;* Uglow, *The Lunar Men: the Friends who made the Future, 1730-1810*, pp 210-1; Jenny Uglow, 'Lunar Society of Birmingham (c.1765-c.1800)', in Matthew and Harrison (eds) *Oxford dictionary of national biography*; Stewart, *The rise of public science*, p. 383; for the ongoing friendship between various Lunar Men see, Francis Doherty, 'An eighteenth-century intellectual friendship: letters of Richard Lovell Edgeworth and the Wedgwoods' in *Proceedings of the Royal Irish Academy, Section C: Archaeology, Celtic Studies, History, Linguistics, Literature*, lxxxvi, no. c (1986), pp 231–69.
[32] Margaret C. Jacob and Larry Steward, *Practical matter: Newton's science in the service of industry and empire, 1687-1851* (Cambridge MA, London, 2004), pp 63-9.
[33] Ibid., pp 68, 96-102.

is why he rarely mentions tradesmen; the theoretical development of scientific apparatus was viewed as significant not their practical construction.

Edgeworth had many potential audiences who were interested in his new invention. Yet, as Iwan Morus has demonstrated in his work on the later electric telegraph, 'telegraph entrepreneurs and inventors had to work hard to find a market for their product that was prepared to provide capital for its realisation rather than simply to marvel at its ingenuity.'[34] Thus, Edgeworth's efforts to promote his tellograph focused not only on the design and, as he would argue, the superiority of his technology, but also on its potential uses.

Edgeworth's efforts were aided by several political allies. In August, 1794, he relayed information twelve miles, from the seat of Lord Longford at Pakenham Hall, Co. Westmeath, to Edgeworthstown, Co. Longford. The Bishop of Ossory, William Beresford, who was also present, suggested that he contact the government through an influential third party. With this advice in mind Edgeworth was to approach John Foster, speaker of the House of Commons.[35]

Foster, a lifelong friend of Edgeworth, would become an important ally in his efforts to promote his invention. Like Edgeworth, he was interested in learning and improvement and, according to his biographer, was a member of the Irish 'Enlightenment'. Both were members of the Royal Irish Academy (RIA), Foster having been elected in May 1785. Foster had been elected speaker of the Irish House of Commons in 1785, and had been in the inner circle of the Irish administration since 1777.[36] He was particularly active in the Royal Dublin Society (RDS), which was formed in 1731 'for improving husbandry, manufacture and other useful arts.'

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[34] Morus, 'The electric Ariel: telegraphy and commercial culture in early Victorian England', p. 342.
[35] Wilson, *The old telegraphs*, p. 104; Clarke, *The ingenious Mr Edgeworth*, p. 140.
[36] A.P.W. Malcomson, *John Foster (1740-1828): the politics of improvement and prosperity* (Dublin, 2011), pp 15-21, 90; A. P. W. Malcomson, 'Foster, John Baron Oriel', in McGuire and Quinn (eds), *Dictionary of Irish biography*.

While he could be contemptuous of RDS members who focused too greatly on abstract scientific theories, he was quite interested in the practical application of 'theory and science to the everyday management of Irish farms.'[37]

In November, 1794, Edgeworth displayed his tellograph for Foster at Collon, Co. Louth.[38] The same month two further exhibitions were undertaken which demonstrated the invention's utility. Perhaps the most spectacular of these displays was when, using thirty-feet-high tellographs, Lovell Edgeworth communicated between Donaghadee, Ireland, and Port Patrick, Scotland. This was significant for two reasons, firstly it demonstrated the distances that the technology could operate over, and secondly, and perhaps most importantly in light of rival British inventors, that his system would allow tellographic communication between the two islands.[39] This was followed by a further display which connected Collon to Dublin.[40]

Edgeworth was to draft a memorial to the new lord lieutenant, Earl Camden. Foster's support could prove invaluable; not only was he well connected in learned and political spheres but he was also on good terms with Camden. Edgeworth obviously valued Foster's opinion and a number of drafts of later memorials concerning his tellograph are present in Foster's papers.[41] In his memorial, Edgeworth was careful to identify numerous uses for his tellograph. While in the first instance it would be a military tool, he also envisaged it having a role

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[37] Malcomson, *John Foster (1740-1828): the politics of improvement and prosperity*, pp 373-4, 377-8, 380, 388-93; A.P.W. Malcomson, *John Foster: the politics of the Anglo-Irish Ascendancy* (Oxford, 1978), p. 198; for an insight into their correspondence see PRONI (FP) D207/36, *c.* 100 letters between members of the Edgeworth family and Foster.
[38] Wilson, *The telegraphs,* p. 104; Clarke, *The ingenious Mr Edgeworth*, p. 140.
[39] Edgeworth, 'An essay on the art of conveying secret and swift intelligence', p. 138.
[40] Clarke, *The ingenious Mr Edgeworth*, p. 140.
[41] Proposal of Richard Lovell Edgeworth, 1796, and Proposal by Richard Lovell Edgeworth [n.d. but probably 1796] (PRONI, D207/36/25 & D207/36/26).

in promoting the exchange of commodities, in facilitating the exchange of commodities, in facilitating the business of insurance, in preventing frauds in lotteries, in equalising the price of grain, and of other merchandize, and in short they may be felt in every intercourse of society.[42]

While unsuccessful in securing Camden's backing, Edgeworth's efforts demonstrate the importance of political support when attempting to attract government sponsorship for technological development in late eighteenth-century Ireland. The emphasis on the range of potential uses for the tellograph also highlights his attempts to create the perception of uses for his innovation. However, despite the range of potential uses the military remained the focus of Edgeworth's efforts, as there was little hope of securing the necessary funding from private sources.[43]

Edgeworth's daughter, Maria, felt that the use of an alternative name, the 'logograph' (as he originally called his invention), was an attempt to emphasise its difference to the French telegraph.[44] Chappe had named his telegraph the *télégraphe*, deriving the name from the Greek *tele*, afar, far off, and *graph*, that writes, delineates, or describes, thus a *télégraphe* wrote at a distance. Edgeworth stated that while the French telegraph transmitted letters at a distance his logograph transmitted words, thus the use of *logo* (words). Logograph was chosen 'because of its allusions to the Logographic printing presses which print words instead of letters'. In his 1794 memorial to Camden, Edgeworth carefully avoided the word 'telegraph' in order to evade any association with the French system 'and preserve the idea of originality for the invention'.[45]

[42] Richard Edgeworth, 'A proposal addressed to his excellency the lord lieutenant of Ireland, for the establishment of a corps of men, to convey secret and swift intelligence, 14 September 1794', in R. L. Edgeworth, *A letter to the right hon. the Earl of Charlemont, on the tellograph and on the defence of Ireland* (Dublin, 1797), pp 7-8.
[43] Edgeworth, *Memoirs of Richard Lovell Edgeworth, Esq.*, ii, p. 160.
[44] Maria Edgeworth to Mrs. Ruxton, 11 April 1795 (NLI, Ms. 10,166/7).
[45] Maria Edgeworth to Sophy Ruxton, 23 Feb. 1794 (NLI, Ms. 10,166/7).

In 1795 Edgeworth changed the name of his device to 'tellograph', demonstrating that like the increasingly well-known Chappe telegraph it transmitted over distances while indicating its uniqueness in allowing the transmission of words, hence the retention of *logo*. Edgeworth felt that while *'telegraph* is a proper name for a machine which describes at a distance. *Telelograph*, or contractedly *tellograph*, is a proper name for a machine that describes *words* at a distance [emphasis in the original]'.[46] Edgeworth, while attempting to promote the art of optical telegraphy, was also aware that 'national pride dislike [s] the sound of the French Telegraph [emphasis in the original]'.[47] In differentiating the two devices he was promoting his tellograph as a *British* telegraph as much as an *Edgeworth* telegraph.

While Edgeworth sought to use political influence to gain the patronage needed to implement his telegraphic system, he was simultaneously engaged with another sphere of influence: scientific authority. While considered separately here, it must be remember that there was a significant overlap between scientific and political spheres in late eighteenth-century Ireland. Edgeworth gave a presentation on his tellograph at the Royal Irish Academy (RIA) on 27 June 1795, which was printed as 'An essay on the art of conveying secret and swift intelligence' in the Academy's *Transactions*, 1797. Much of our information on Edgeworth's tellograph is based on this article. It provides a broad over-view of efforts to expedite communication over long distances; Edgeworth's own early efforts in the 1760s are discussed, before his engagement with his contemporary experiments.[48]

The RIA, modelled on the Royal Society of London, was established in 1785 to 'promote the study of science, polite literature and antiquities'. It received a royal charter the following year and would develop into one of the main bodies for the

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[46] Edgeworth, 'An essay on the art of conveying secret and swift intelligence', p. 126.
[47] Maria Edgeworth to Sophy Ruxton, 23 Feb. 1794 (NLI, Ms. 10,166/7).
[48] Edgeworth, 'An essay on the art of conveying secret and swift intelligence'.

gentlemanly and scholarly study of science in Ireland. The academy's approval

would have brought Edgeworth's telegraph much prestige. [49] Indeed such institutions

were as much 'lobbies for influence' as they were centres of scientific learning and

membership implied a level of technical and scientific competence.[50] The

publication of his presentation in the society's *Transactions* furthered Edgeworth's

attempts to define a role for optical telegraphy. In addition, the society's membership

was made up of the elite of Irish society. For example, James Caulfeild, First Earl of

Charlemont, was the society's first president and was a supporter of Edgeworth's

telegraph from at least 1794. He and other members of the RIA were useful allies in

Edgeworth's efforts to promote his invention.[51]

The discussion of innovations such as Edgeworth's telegraph at RIA

meetings is not surprising given the Academy's aim not only to study science but

also to prove such studies useful to the economy of the country.[52] In his paper

Edgeworth highlighted that his invention would enable the speedy deployment of the

military upon any invading or native belligerents. He again emphasised the multiple

uses to which his tellograph could be put, including the transmission of commercial

information. In meteorological forecasting the connection of the major ports of

Ireland and Britain would assist in furthering knowledge of this science.[53] Thus, in

his presentation to the RIA Edgeworth stated that his telegraph would not only help

combat immediate security problems but also aid the economy and assist in scientific

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[49] R.B. McDowell, 'The main narrative: before 1800', in T.Ó. Raifeartaigh, *The Royal Irish Academy: a bicentennial history, 1795-1985* (Dublin, 1985), pp 8-11; Jacob and Stewart, *Practical matter: Newton's science in the service of industry and empire, 1687-1851*, pp 37-41.
[50] Simon Schaffer, 'A presiding influence': the relations of the 3rd Earl of Rosse with scientific institutions in Britain and Ireland' in Charles Mollan (ed.), *William Parsons, 3rd Earl of Rosse: Astronomy and the castle in nineteenth-century Ireland* (Manchester and New York, 2014), pp 298-328, at pp 315-316; Jacob and Stewart, *Practical matter, 1687-1851*, p. 38.
[51] McDowell, 'The main narrative: before 1800', p. 9; Maria Edgeworth to Sophy Ruxton, 14 July 1790 (NLI, Ms. 10,166/7).
[52] McDowell, 'The main narrative: before 1800', p. 13.
[53] Edgeworth, 'An essay on the art of conveying secret and swift intelligence', pp 110-18.

pursuits. This was exactly the potential that the founders of the RIA aspired to in the application of science.
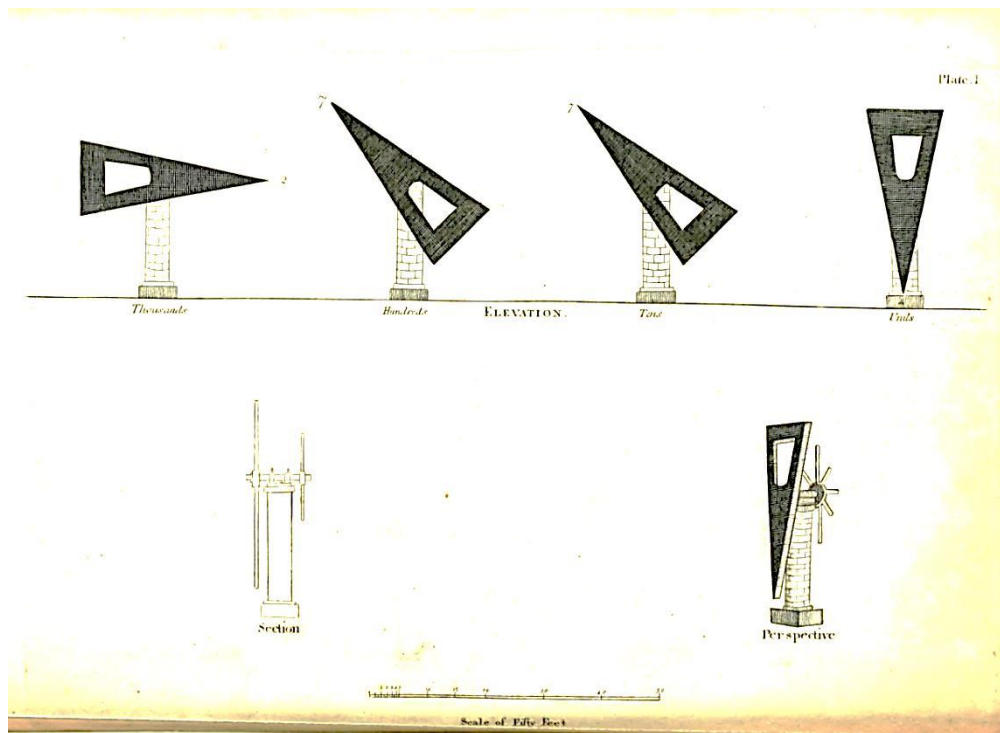
Fig. 1.3 Edgeworth's proposed fixed tellograph towers
Source: Richard Lovell Edgeworth, 'An essay on the art of conveying secret and swift intelligence', in *The Transactions of the Royal Irish Academy*, vi (1797), plate 4.

At the RIA Edgeworth outlined that his communication system, consisting of telegraph stations positioned up to twenty-miles apart, would relay four-digit codes. Each station would consist of four tellographs mounted on solid wooded or stone pillars, sixteen to twenty-feet high, on top of which would be placed triangular pointers. These would be made of timber frames with canvas covers and could be rotated to signal in any direction (fig. 1.3). The triangular pointers would relay the digits zero to seven, by pointing horizontally, vertically and diagonally, in clockwise rotation, beginning with zero at the top (fig. 1.4). Each tellograph would denote a single digit of the four digit code. These fixed telegraph stations could also be fortified against 'mob or musketry', signifying that they were designed to combat the dual threat of Irish rebellion or French invasion. They would require one man at each

tower, a further one using a telescope and another using the telegraphic vocabulary to decipher the codes.[54]

View of the 8 different positions of the Tellograph
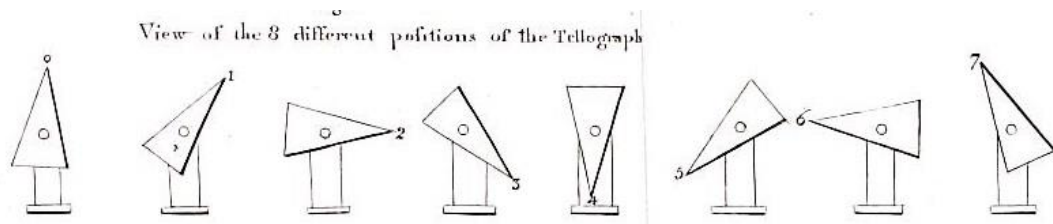
Fig. 1.4 Diagram of positions of pointers on fixed Edgeworth telegraphic tower
Source: Richard Lovell Edgeworth, 'An essay on the art of conveying secret and swift intelligence,' in *The Transactions of the Royal Irish Academy*, vi (1797), plate 2.
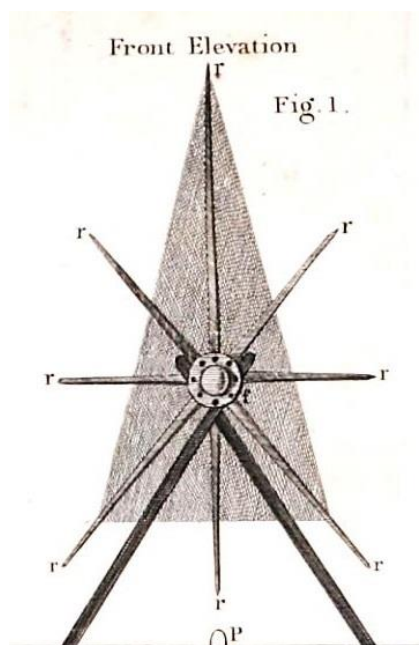
Fig. 1.5 Front elevation of Edgeworth portable telegraphic apparatus
Source: Richard Lovell Edgeworth, 'An essay on the art of conveying secret and swift intelligence,' in *The Transactions of the Royal Irish Academy*, vi (1797), plate 1.

The telegraphic system would also incorporate mobile telegraphic apparatus (fig. 1.5). These would consist of ten-to-twelve-feet long pointers placed on triangular stands, which would be attached to the ground using rope and tent pegs (fig. 1.6). The smallest of these, at six foot, could be erected by one man. While portable telegraphs would have a smaller range than those of a fixed nature, they did offer many advantages. They could be placed outside the line of communication between the fixed stations, temporarily connecting areas to the larger tellograph network. This could

be quite valuable to an army corps in relaying information and receiving instructions. In bad weather, which might disable communication between the fixed tellograph towers, they would act as intermediary stations. They could also remove the need to maintain costly fixed stations, allowing for the training of a telegraphic corps which

[54] Ibid., pp 129, 132.

could be used in times of crisis. Edgeworth also envisaged a 'nocturnal telegraph' but nothing more is known about it. [55]
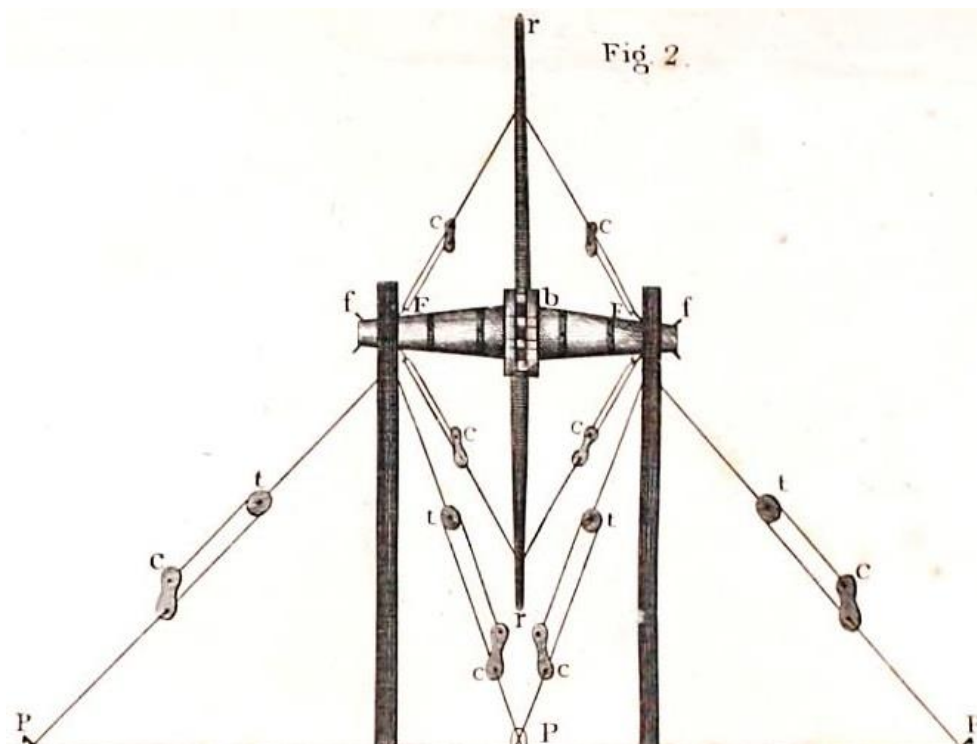
Fig. 1.6 Side elevation of Edgeworth portable telegraphic apparatus
Source: Richard Lovell Edgeworth, 'An essay on the art of conveying secret and swift intelligence,' in *The Transactions of the Royal Irish Academy*, vi (1797), plate 1.

Edgeworth was not just proposing a communication apparatus but a communication system, with a detailed operational framework. Like latter day technological system builders, he faced problems integrating the various components, technological and human.[56] He would rely heavily on his telegraphic corps, setting out strict operational guidelines. Dublin was to initiate communication at fixed times each day. If it had no intelligence it would relay to the rest of the country to begin transmitting. At this point the outer arms at each station were to 'whirl' continuously in a circle until the answering station did the same. The sending station could then commence signalling. The receiving station would turn its arm for

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[55] Edgeworth to Littlehales, 12 Oct. 1803 (NLI, Ms. 8182, folder 1); Edgeworth, 'An essay on the art of conveying secret and swift intelligence', pp 129, 132-3, 137.
[56] For the challenges of building such systems see Thomas Hughes, *Networks of power: Electrification in western society, 1880-1930* (Baltimore, 1983).

hundreds to the number two position and it would remain there until the word was retrieved from the telegraph vocabulary, at which point the arm would be moved to zero. On this signal the sending station would move all its arms to zero, confirming that the word was sent and received. Once communication was completed the sending station's outer arms would be directed downward and swung like a pendulum until the receiving station did likewise; however, if there was an interruption these arms would point upward and 'vibrate'.[57] This meticulous operation could be frustrating but there was a pressing need for a firm set of instructions with which to regulate the telegraphic system. Edgeworth's tellograph, while speedy, relied upon a faithful relaying of information along the telegraphic line.[58]

The nature of the work meant that there was no room for error or perfunctoriness and Edgeworth realised the importance of reliable men. For this reason the pay of a private in the telegraphic corps was '½ d more than that of any Sergeant in the line'.[59] However, this rate of pay was justified by the competence of the men who operated the telegraphs, the isolated nature of the work and the requirement that they should be literate. While the Chappe telegraph was the most prominent optical telegraph used in Europe, there is no evidence that Edgeworth modelled the duties and training of his corps on it. Secrecy was also of the upmost importance and, as highlighted by the epigraph to this chapter, the Telegraphic Corps would be bound by oath to ensure this.

The other component of the telegraph system was the telegraphic vocabulary, used to translate the relayed four-digit codes. Edgeworth argued that, unlike the

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[57] Edgeworth, 'An essay on the art of conveying secret and swift intelligence', pp 130-31.
[58] R.L. Edgeworth, 'Supplement to Mr Edgeworth's essay upon the telegraph', *The Transactions of the Royal Irish Academy,* vi (1797), pp 313-7, at p. 315.
[59] Francis Beaufort to Fanny [?], 29 Mar. 1804 (NLI, Ms. 8182, folder 9).

French telegraph, his could not be read unless one possessed a vocabulary and a simple change of the numeration would make any vocabulary obtained by the enemy obsolete.[60] However, in practice the Chappe system used its signals not to transmit letters but rather codes for pre-arranged ciphers.[61]

The design of the tellograph limited the number of signals that it could transmit to eight. This limitation need not have been a hindrance; the Morse telegraph had only two signals—dots and dashes. It did however present Edgeworth with the choice to either design a code that would transmit individual letters and digits or set messages based on a sequence of signals (in this case the numbers zero to seven, representing the eight points on the tellograph). Edgeworth designed his vocabulary on the latter principle, using four-digit codes that would be translated using a vocabulary. Despite promoting a vocabulary that was concerned with military matters, Edgeworth envisaged multiple vocabularies that could be used for transmitting various types of intelligence.[62]

The military vocabulary contained entries up to 7357, excluding the numbers eight and nine, which could not be transmitted, covering a range of messages—there were also codes for each letter if a word had to be spelled out. The vocabulary highlights Edgeworth's efforts to attract military patronage for his invention. Examples of these messages include:

7275, Can the yeomanry be ready to march at an hours' notice; 7276, is the ford on the Shannon passable at; 7277, what is the disposition of the peasantry; 7311, what is the rebel force; 7312, who is their general; 7313, has the mail coach arrived safe from; 7347, a number of pikes at; 7352, the ring leaders are apprehended; 7353, a fire has broken out at; 7354, a ship is lost; 7355, the French have taken; 7356, there is a smoke over the town of.[63]

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[60] Edgeworth, 'An essay on the art of conveying secret and swift intelligence', pp 136-7.
[61] Beauchamp, *The history of telegraphy*, p. 6.
[62] Edgeworth, *A letter to the right hon. the Earl of Charlemont*, p. 19.
[63] Telegraph code by R. L. Edgeworth, with the heading, vocabulary complete, late 18th cent. (NLI, Ms. 7393).

As can be seen from these extracts the tellograph was at this point marketed as a tool to address a perceived threat from not just the French but also the local population.

Edgeworth was to continue to promote his invention as a means of protecting Ireland from French invasion and indigenous rebellion. From the summer of 1796 such an invasion had become increasingly likely and plans for landing French forces in Ireland, Wales and the south of England were well known. Dublin Castle was also aware of the threat emanating from the pro-French United Irishmen and Defenders, particularly in Ulster, and on 6 November 1796 the counties Antrim, Down, Tyrone, Derry and Armagh were placed under the Insurrection Act. Of definite concern to the authorities was the capture of the *Olive Branch* with 20,000 stand of arms and an entire field-train of artillery en-route to Ireland from France; the ship had already made several journeys between the two countries. These events ratcheted fears of a rebellion and tensions were high.[64]

In January 1796, in a letter to a Mr O'Byrne,[65] Edgeworth wrote of his frustration at the lack of defensive preparations in Ireland. To this end he offered to contribute £500 to the construction of a tellograph network to protect the island from 'foreign invasion or domestic insurrection.'[66] Edgeworth was to demonstrate his tellograph to Earl Camden, on 3 October 1796. His immediate focus was the potential construction of a Dublin to Cork optical tellograph line, Cork being perceived as a likely French landing site. He also hoped for the eventual development of a nationwide system, which he estimated would cost £6,000 or £7,000 (fig. 1.7).[67] This would consist of approximately thirty permanent stations

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[64] Elliott, *Partners in revolution*, pp 57, 67, 92-4, 106, 108.
[65] This gentleman has not been identified to date.
[66] R.L. Edgeworth to Mr O'Byrne, in Maria Edgeworth to Mrs Ruxton, 26 Jan. 1796 (NLI, Ms. 10,166/7).
[67] Edgeworth to Mr Pelham, memorial, 6 Oct. 1796, quoted in Edgeworth, *Memoirs of Richard Lovell Edgeworth, Esq.* ii, p. 162.

supported by portable apparatus. He estimated that each permanent station would cost around £300 but the substitution of these with portable telegraphs would halve the cost. Nevertheless, the expense of such an undertaking was still considerable given that it would be a new and sustained drain on the exchequer.[68]

Responding to Edgeworth's advances Thomas Pelham, later Lord Chichester, then chief secretary of Ireland, outlined that the lord lieutenant had sought advice as to advantages of such a system but the Admiralty was not inclined to back the proposals. While the lord lieutenant was impressed with the invention, he could not at that point 'see any purpose in this country for which he could be warranted in incurring the expense'. Therefore, while the 'utility of a telegraph may hereafter be considered greater' it was not to be implemented at this juncture. [69] Hence, the rationale against implementing the technology was not its practicality but rather its cost.

Alongside his efforts to convince the Irish administration of the tellograph's merits, Edgeworth's son Lovell demonstrated the invention to the Duke of York, at Kensington Gardens, in October 1796.[70] The duke, who as already outlined was interested in developing a field telegraph for the army, seemed quite impressed and talked of using the admiralty telegraph as far as Port Patrick, Scotland, and then Edgeworth's system in Ireland;[71] however, nothing came of this approach.[72]

Following these exhibitions Edgeworth composed a supplement to his RIA essay, dated 3 December 1796. Interestingly, Edgeworth refers to his apparatus as the telegraph throughout. He had made a number of modifications to his invention,

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[68] Edgeworth, *A letter to the right hon. the Earl of Charlemont*, p. 9.
[69] Historical Manuscripts Commission (HMC) *The manuscripts and correspondence of James, first earl of Charlemont,* Copy of Mr Pelham's letter to Mr Edgeworth, 17 Nov. 1796 (2 vols, London, 18), ii, p. 288.
[70] Edgeworth, 'Supplement to Mr Edgeworth's essay upon the telegraph', p. 316.
[71] Lovell Edgeworth to Richard Lovell Edgeworth, 29 Oct. 1796, copy by C. Sneyd (NLI, Ms. 10,166/7).
[72] Edgeworth, *Memoirs of Richard Lovell Edgeworth, Esq.*, ii, p. 165.

including improved supports for stormy weather. He had also decided, in what was

likely a cost-saving exercise, to use one machine at each station rather than four.[73]

French landings and Irish rebellion

In December of 1796, in response to lobbying by the United Irishmen, a

French invasion force of approximately 14,000 troops, under the command of

General Hoche, left Brest. The fleet also carried 41,644 stand of arms for domestic

insurgents. The bulk of the force arrived off Bantry Bay, Co. Cork, on 22 December,

but did not disembark due to unfavourable weather.[74]

The failure of the British navy to intercept the French alerted loyalists in

Ireland that they could not rely on it for protection. Military surveys reveal that there

were only around 6,000 troops available to meet an invading force at the coast and

that it would take up to five days to assemble such a force at the landing site. It was

realised that improvements were needed in Ireland's defences and proposals included

the creation of a mobile force for rapid deployment against any enemy. In this

context the ability of Edgeworth's telegraph to concentrate forces rapidly was an

important marketing point for the technology.[75] Edgeworth, referring to Bantry Bay,

stated that 'we escaped absolute conquest but narrowly and … I see no reason why

the French may not return'.[76] He was to press the government, most publicly in his

pamphlet *A letter to the right hon. the Earl of Charlemont, on the tellograph and on*

the defence of Ireland (Dublin, 1797). This pamphlet gives an account of

Edgeworth's efforts to promote his invention and in doing so emphasises how the art

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[73] Edgeworth, 'Supplement to Mr Edgeworth's essay upon the telegraph', pp 313-7.
[74] Elliott, *Partners in revolution*, pp 111-3; Marianne Elliott, *Wolfe Tone: prophet of Irish independence* (New Haven, London, 1989), p. 328.
[75] Elliott, *Partners in revolution,* p. 121; Elliott, *Wolfe Tone,* pp 328-9.
[76] R.L. Edgeworth to Mrs Mary [?], 20 Feb. 1797 (NLI, Ms. 10,166/7).

of telegraphy could be used for the relaying of information and deployment of troops in case of invasion.[77]

In 1798, Ireland was convulsed by the United Irishman rebellion. In support of the uprising the French landed a force of approximately 1,000 troops, under General Humbert, in county Mayo in August; Edgeworth sent a letter to Lord Cornwallis offering the services of his telegraph but to no avail.[78] With the signing of the peace of Amiens, 27 March 1802, the immediate threat to Ireland receded. However, with the renewal of hostilities in 1803, and naval preparations in France's western ports, the threat of invasion was to return. In addition, remnants of the United Irishmen also planned to rise against British rule, plans which came to fruition as the attempted Emmet rising on the night of 23 July 1803. Despite the rising being a disaster for the rebels, the secrecy with which it was planned led to a wave of loyalist hysteria. The administration simply did not know the extent of the threat which it faced and a potential French invasion seemed very real.[79]

Ireland's defences were in a precarious condition. While the rapid brigade system, designed to engage an enemy invasion, had been maintained, significant reductions in the army had taken place following the suppression of the 1798 rebellion. This meant that it was essential for the army to avoid engagement before the intentions of the French were known. Such a situation only exacerbated the need for rapid communication. In light of this new security situation the government was to engage hastily in the construction of defences and the improvement of communication. It was in this climate of heightened military threat and poor

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[77] Edgeworth, *A letter to the right hon. the Earl of Charlemont.*
[78] Maria Edgeworth to Sophy Ruxton, 29 Aug. 1798 (NLI, Ms. 10,166/7); Elliott, *Partners in revolution,* pp 222-7.
[79] McDowell, 'The Protestant Nation', p. 247; Elliott, *Partners in revolution,* pp 316-20, 324.

preparations that the state was willing to invest in new technologies.[80] It embarked

upon a number of projects, ranging from the employment of gunships and Martello

towers at strategic points along the coast to defensive fortifications along the

Shannon.[81]

Long-distance visual communication was also an option that the government

considered. Indeed 'telegraphic fires' were used in July 1803 to alert the province of

Munster to the failure of the Emmet rising in July. These fires were, however, a

source of great concern, for it was not the authorities who were in possession of

superior communications but the rebels. General Tarleton, during a parliamentary

debate on the matter in 1804, voiced his belief that the rebels in Munster, by using

telegraphic fires, were able to learn of the defeat of the Dublin rebellion before the

'King's officers in Cork'.[82]

In 1803, in light of the renewed threat of rebellion and a possible invasion,

Edgeworth demonstrated his tellograph for the Earl of Hardwicke, the lord

lieutenant. This involved a telegraphic link between Castleknock, Co. Dublin, and

Carton—the seat of the Duke of Leinster—Co. Kildare, a distance of over twelve

miles. Hardwicke was impressed by the demonstration and requested that Edgeworth

construct a pilot telegraph line, from Dublin to Galway, in preparation for a national

network.[83] This enterprise was designated the 'Telegraphic Establishment';

importantly, given that it was a pilot line, it was to use *portable* tellographs. Maria

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[80] Elliott, *Partners in revolution,* p. 334.
[81] Hardwicke to Charles Yorke, [ND] (TNA, HO 100/111, f. 186); J.H. McEnery, *Fortress Ireland: the story of the Irish coastal forts and the River Shannon defence line* (Wicklow, 2006), pp 65-72, 89-116.
[82] *Hansard 1,* i, 735-806 (7 Mar. 1804).
[83] E.B. Littlehales to Edgeworth, 3 Nov. 1803 (NLI, Ms. 8182, folder 5).

Edgeworth only hoped that God would 'keep Bonaparte away till the Giant Isosceles is ready on the coast to meet him.'[84]
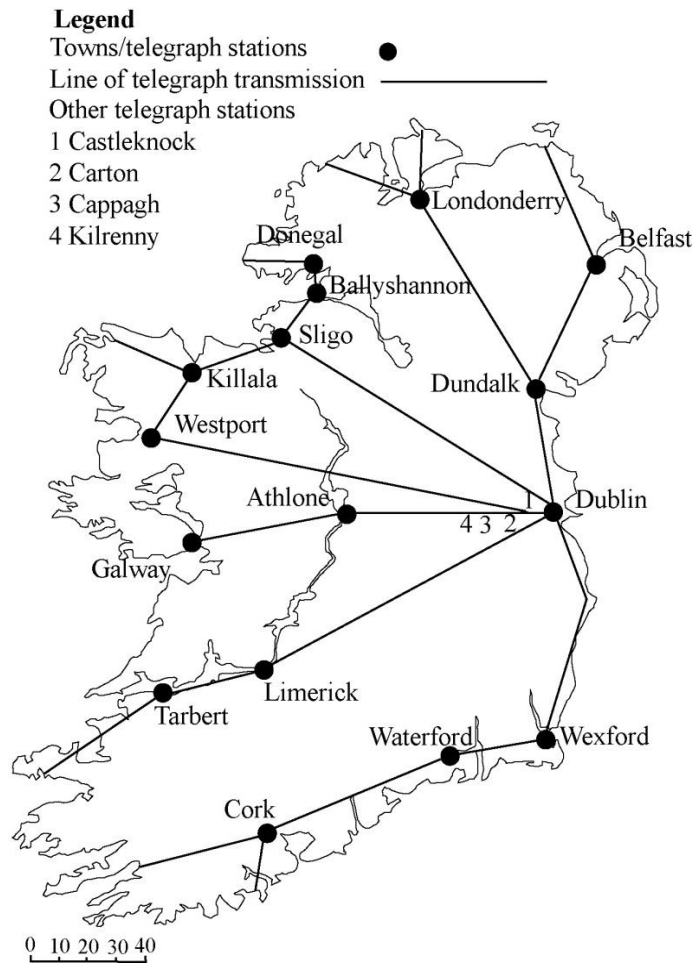
Fig. 1.7 Proposed national telegraph system for Ireland, *c*. 1803
Source: Redrawn by A.J. Kirwan from sketch of a map of Ireland with the lines of telegraphic communication (N.L.I., MS 45, 020).

Edgeworth envisaged a network of watches on all the main coastal vantage points which would use fires to alert a national optical telegraph network.[85] This network would connect Dublin, to Cork via Waterford; to Galway via Athlone; to Westport and Donegal town via Sligo; and to Dundalk with two branches from here, one leading to Letterkenny and one to Belfast, allowing for communication between

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[84] Maria Edgeworth to Sophy Ruxton, 16 Dec. 1803 (NLI, Ms. 10,166/7).
[85] Edgeworth to Littlehales, 12 Oct.1803 (NLI, Ms. 8182, folder 1).

Ireland and Britain[86] (fig. 1.7). Edgeworth estimated that the eighty-five station national telegraph system would cost up to £8,000, as this was solely for use by the military it would be completely funded by the state.[87] His proposed system would only be used during times of possible French invasion. He estimated that the corps would train two days per week and would be on permanent duty only twenty days per year.[88]

The government decided to construct two separate optical communication networks. The first was a line of coastal semaphore towers—similar to those in operation along the southern coast of Britain which used a system of flags and balls. It would alert the government of French naval movements and landings. In little under a year the system was operational along the south-west coast; by 3 July 1804 the construction and manning of the signal stations and defensive guard-towers had cost £40,000. While the British system had not included defensive towers, they were needed in Ireland to protect the signalling crew from 'internal enemies'.[89] Thus, Edgeworth's pilot tellograph line rather than being adopted as a warning system for French naval movements was instead commissioned as a field telegraph allowing for rapid internal communication. Importantly, the route of the pilot line would allow for a station to be established at Athlone, which was to act as a rallying point and bulwark against any French landing in Connaught. It would 'be applicable to many objects of internal police, as well as that most important one of military

[86] Edgeworth, 'An essay on the art of conveying secret and swift intelligence', p. 138.
[87] Edgeworth to Littlehales, 30 Dec. 1804 (NLI, Ms. 8182, folder 10).
[88] R.L. Edgeworth to [?], 13 Oct. 1803 (NAI, OP/174/18).
[89] P.C. Stoddart, 'Counter-insurgency and defence in Ireland, 1790-1805' (Ph.D. thesis, Department of History, University of Oxford, 1972), pp 375, 378-80; Memoranda, 3 July 1804 (TNA, HO 100/121, f. 7); Hardwicke to Hawksbury, 28 Sept. 1804 (TNA, HO 100/121, f.121); P. M. Kerrigan, *Castles and fortifications, 1485-1945* (Cork, 1995), pp 156-157.

communication' and Hardwicke felt that 'there can be doubt of the advantage that it will produce'.[90]

The pilot line consisting of portable tellographs, with temporary guard houses and a telegraphic corps raised from the Edgeworthstown yeomanry,[91] commenced at the Royal Hospital, Kilmainham; it then went to Castleknock; then to Carton, the seat of the Duke of Leinster.[92] The next station at the Hill of Cappagh, near Kilcock, was fortified using the ruins of a windmill as an experiment.[93] There were a further eleven stations in the line, including Athlone and Galway.[94]

By December 1803 the telegraphic vocabulary was nearly completed and dedicated with the words 'by arms and science Hardwicke guards a throne and with a nation's glory blends his own.'[95] With this dedication Edgeworth was demonstrating his belief that the new science was an intricate part of national security, and that science was a practical matter as much as a theoretical one. Indeed, this association between the practical application of science and national defence was a central factor in Edgeworth's success. On 14 January 1804 Edgeworth was able to claim that 'after various attempts we have at length succeeded in completing a chain of stations from Dublin to Galway.'[96] In the same month there was also a request from the government to build defensive towers at fifteen stations.[97]

By March of 1804 the telegraphic system was operational from Dublin to Athlone.[98] Problems were still being experienced in June; according to Francis

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[90] Hardwicke to Hawksbury, 7 June 1804 (TNA, HO 100/120, f. 47).
[91] Edgeworth, *Memoirs of Richard Lovell Edgeworth, Esq.,* ii, pp 297-298.
[92] Richard Lovell Edgeworth to Maria Edgeworth, in Maria Edgeworth to Sophy Ruxton, Nov. 1803 (NLI, Ms. 10,166/7).
[93] Edgeworth, *Memoirs of Richard Lovell Edgeworth, Esq.,* ii, pp 298-299.
[94] *Freeman's Journal,* 7 July 1804.
[95] Ibid.
[96] Edgeworth to Littlehales, 14 Jan. 1804 (NLI, Ms. 8182, folder 2).
[97] Edgeworth to Littlehales, Aug. 1804 (NLI, Ms. 8182, folder 4).
[98] Charlotte Edgeworth to Emmeline King, 13 Mar. 1804 (NLI, Ms. 10,166/7).

Beaufort[99] 'at 10 minutes past 9 this morning arrived the whirl—the harbingers of success and joy I fondly thought', but the operators could not 'make head or tail' of the codes received.[100] These problems were resolved and on 22 July Maria Edgeworth wrote that her father had gone 'to open the air canal from Dublin to Galway' before the lord lieutenant.[101]

Edgeworth's memoirs claim that telegraphic communication between Dublin and Galway was carried out in eight minutes.[102] This rapid speed is supported by an article in the *Freeman's Journal*, 7 July 1804, which states that a telegraph message of 'considerable length' was sent to Galway from Dublin in thirty-five minutes and a return message was received in less than five minutes. It therefore took forty minutes to send and receive a message from Dublin to Galway. This article also states that 'forty-four signals have actually been sent and received in thirty-nine minutes.' This swiftness of transmission represented a revolution in communication.[103]

In his efforts to promote his invention Edgeworth was careful to emphasise that he was motivated purely by a desire to aid his country. His proclamations were so convincing that in June 1804 the lord lieutenant informed Edgeworth that a Colonel Robinson would replace him as commander of the Telegraph Corps once the pilot line was completed. Edgeworth was quick to respond claiming that he had always intended to seek a position, such as superintendent of telegraphs, and to claim remuneration for such a role.[104] This came as a shock to E.B. Littlehales who

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[99] Beaufort, Edgeworth's brother-in-law, was to be his chief aide in the construction of the telegraph line. He would go on to become a rear-admiral, hydrographer to the Royal Navy, FRS, MRIA, fellow of the Royal Astronomical Society and honorary fellow of the Geological Society of London; he is probably best known as the creator of the Beaufort scale.
[100] Francis Beaufort to Edgeworth, 25 June 1804 (NLI, Ms. 8182, folder 9).
[101] Anon to Edgeworth, 4 July. 1804 (NLI, Ms. 8182, folder 9); Maria Edgeworth to Sophy Ruxton, 22 July 1804 (NLI, Ms. 10,166/7).
[102] Edgeworth, *Memoirs of Richard Lovell Edgeworth, Esq.,* ii, p. 298.
[103] *Freeman's Journal,* 7 July 1804.
[104] R.L. Edgeworth to Lord Hardwicke, 4 July 1804 (BL, Ms. 35768, f. 176).

suggested that Hardwicke attempt to settle the dispute. [105] Edgeworth was eventually appointed superintendent with a salary of £300 per annum, with Hardwicke noting that Edgeworth had undertaken the execution of the line 'from public spirit'. [106]

In October 1804 Hardwicke was reminded by Lord Hawkesbury, Home Secretary, that due to the 'lateness of the season and the backward state of many of the works,' on both signalling systems, it might be advisable to 'forgo the erection of such as may be considered as least important'. This would ensure the completion of the most important stations before winter set in. [107] Hardwicke replied that in consequence of these suggestions they would concentrate on the completion of stations 'of more consequence'. Both Hawkesbury and Hardwicke were also concerned with expenditure and Hardwicke did not want to incur 'an expense without a certainty of adequate advantage.' [108]

Despite the Telegraphic Establishment's successful operation, problems forming a unit to operate it were ongoing. Edgeworth had organised a corps from the Edgeworthstown Yeomanry but plans were also put forward to use invalids. [109] These difficulties were to continue to December 1804. [110] At this point the telegraph line between Dublin and Galway had been suspended, [111] a decision was made to restrict expenditure and concentrate on the completion of the coastal signalling stations. [112]

In addition to the construction of signalling stations, work had also begun on a network of Martello towers at strategic locations around the Irish coast. Other significant defence works, including those on the river Shannon, would act as a bulwark to contain a foreign landing on the west coast. Edgeworth reasoned that the

[105] E.B. Littlehales to Lord Hardwicke, 23 June 1804 (BL, Ms. 35768, f. 168).
[106] Hardwicke to Hawksbury, 28 Sept. 1804 (TNA, HO 100/121, f. 121).
[107] Hawkesbury to Hardwicke, 23 Oct. 1804, in Ibid, f. 181.
[108] Hardwicke to Hawkesbury, 26 Nov. 1804, Ibid, f. 251.
[109] Record of letter from R.L. Edgeworth, 22 March 1804 (NAI, OP/174/18).
[110] Stoddart, 'Counter-insurgency and defence in Ireland, 1790-1805', p. 378.
[111] R.L. Edgeworth to E.B. Littlehales, 30 Dec. 1804 (NLI, MS. 8182, folder 10).
[112] Hardwicke to Hawkesbury, 26 Nov. 1804 (TNA, HO 100/121, f. 251).

improved fortifications would no doubt lead to a change in French invasion plans and, in a letter to Littlehales on 30 December, he pushed for a nation-wide telegraph network to meet this challenge.[113] At this point the Establishment's suspension did not appear permanent and Edgeworth was still sending maps and letters relating to a proposed nation-wide telegraph network.[114] Littlehales, was definitely under the impression that the service was to be retained. He wrote to Hardwicke in January 1805 seeking clarity on the rates of pay for the corps and other queries from Edgeworth, while Maria Edgeworth stated in March 1805 that the government intended to continue with the establishment.[115]

In August 1804, Russia, Austria and England formed the third coalition against France, reducing the availability of French troops for an Irish invasion. France's ability to invade was further restricted when, on 21 October 1805, the Franco-Spanish fleet was destroyed at Trafalgar.[116] Thus, the diminishing threat of French invasion combined with improved fortifications in Ireland meant that the expense of the 'Telegraphic Establishment' again outweighed the perceived benefits. It would not become operational again—by 1809 even the coastal signalling towers were abandoned.

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[113] R.L. Edgeworth to E.B. Littlehales, 30 Dec. 1804 (NLI, MS 8182, folder 10); R.L. Edgeworth to Anon [probably E.B. Littlehales], 30 Dec. 1804 (BL, MS 35755, f. 88).

[114] R.L. Edgeworth to E.B. Littlehales, 30 Dec. 1804 (BL, MS 35755, f. 82), R.L. Edgeworth to [?] [probably E.B. Littlehales], 30 Dec. 1804, in ibid, f. 88.

[115] E.B. Littlehales to Lord Hardwicke, 8 Jan. 1805, in Ibid, f. 77; Maria Edgeworth to Mrs Ruxton, 21 Mar. 1805 (NLI, MS 10,166/7)

[116] James Kelly, "'Disappointing the boundless ambition of France": Irish protestants and the fear of invasion, 1661-1815' in *Studia Hibernica,* xxxvii (2011), pp 27-105, at p. 101; Elliott, *Partners in revolution,* pp 339-40.

Conclusion

It is unlikely that optical telegraphy, as it developed during the eighteenth century, was viewed as anything other than an amusing, albeit expensive, curiosity. Hence, the implementation of the technology in a number of countries in the 1790s and 1800s provides valuable insights into how broader factors, in this case the events surrounding the French revolution, influence the success or failure of technologies. In France a centralising regime made use of the telegraph to transmit administrative and military intelligence, and the perceived benefits were deemed to outweigh its high cost. In Britain—at war with France from 1803—conservativism toward technological innovation was also overcome. However, since the Royal Navy formed the mainstay of Britain's defences, the widespread adoption of telegraphy for government and military use, as in France, was not to happen.

In Ireland, R.L. Edgeworth, aware of the opportunity provided by the heightened military and political tensions, began to promote his own optical telegraph. By focusing on a military use he sought to secure government support to construct a national telegraph network. Edgeworth faced many competitors and so it was important for him to promote *his* telegraph as *the* telegraph. In order to do this, he engaged in a series of exhibitions which proved its effectiveness and efficiency. He attempted to build up the political, scientific and civic capital required to influence the government by making presentations to the RIA. Such institutions were powerful sites of influence and by using its authority Edgeworth was able to fashion himself as an impartial party whose interest in the implementation of optical telegraphy was driven by purely scientific and patriotic motives. While successful in his efforts to promote *his* telegraph, gaining recognition from the lord lieutenant of its reliability, its implementation remained elusive. The central reason was that the

perceived threat of French invasion was not deemed great enough to warrant the expenditure needed for its construction and operation.

However, following multiple, real and attempted, French landings and Irish rebellions, the government was alert to the dangers it faced when the Peace of Amiens collapsed in 1803. With the island's defences in disarray the high cost of Edgeworth's tellograph had become acceptable. Thus, in the context of a threatened French invasion and fear of indigenous rebellion the tellograph was a successful technology. The fact that Edgeworth's tellograph was adopted is testament more to the efforts he made to promote *his* telegraph than any inherent superiority in design. Its implementation demonstrates that Edgeworth had successfully constructed a market for his tellograph.

Despite the initial success of the Edgeworth tellograph and the establishment of a pilot line, it was ultimately a failed technology. The initial suspension of the telegraph establishment at the end of 1804 was due to delays in manning the stations and a reluctance to expend money, understandable given the heavy burden on the exchequer due to the war. Conversely, the suspension appeared to be temporary. However, it was never to operate again; the reducing threat of French invasion; the improvement of defensive fortifications, particularly along the river Shannon, and the continued reluctance to burden the strained exchequer were decisive. The failure of Edgeworth's tellograph was not in any inherent design fault but rather in its inventor's inability to construct and sustain the perception of a market for it.

As this case study has demonstrated technological development and implementation is not purely a matter of engineering. In rejecting 'technological determinism'—the notion 'that technological change is an independent factor,

impacting society from outside of society'[117]—and accepting that 'social groups

shape technology'[118] it provides insights into the multiple factors that influence a

technology's development and that decide if, how, and when it becomes successful.

It demonstrates that the development of optical telegraphy in Ireland was strongly

influenced by international political, military and technological factors, but also

intensely shaped by internal factors. Thus, the study of technology provides valuable

insights into much larger historic concerns such as patronage; the influence of

learned societies; networks of civic, political and social influence; as well as the

impact of external factors, in this case French invasion and war, on the course of

Irish history.

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[117] Donald MacKenzie and Judy Wajcman, 'Introductory essay: the social shaping of technology' in Donald MacKenzie and Judy Wajcman, *The social shaping of technology* (2nd ed., Maidenhead, 2006), pp 3-27, at p. 5.
[118] Ronald Kline and Trevor Pinch, 'The social construction of technology' in Donald MacKenzie and Judy Wajcman, *The social shaping of technology* (2nd ed., Maidenhead, 2006), pp 113-6, at pp 113-4.

Chapter II

Early developments and application of the electro-magnetic telegraph in Britain and Ireland, 1800-68

> Those who admire modern civilization usually identify it with the steam engine and the electric telegraph.   George Bernard Shaw.[1]

Beginning in the 1830s a series of scientific and technological events took placed that marked the beginning of a telecommunications revolution that is still underway. One of the cradles of this revolution was the United Kingdom. The spread of telegraphic technology in Britain, as opposed to Continental Europe, was not state-sponsored but relied upon private enterprise. Those seeking to promote telegraphy were motivated by profit which was very evident in the nature and expansion of early telegraph networks. In Ireland the spread of this technology was initially lethargic; indeed, it was the connection of the island to mainland Britain that was the driving force in the expansion of the Irish telegraphic network.

In the introduction to his seminal work *Networks of power: electrification in western society*, Thomas Hughes highlights the need for the historian to trace not only the narrative of technological development but to also seek out an understanding of why it happened in the manner that it did.[2] This chapter, in line with the aims of this thesis, shall focus on this question: the why? In order to understand the development of telegraphy in Ireland we must acknowledge that while technology in itself can have agency, in the sense that technology can facilitate and change human actions and behaviours that would not be possible without it,[3] its development and implementation is part of a much larger process in which wider

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[1] George Bernard Shaw, 'Maxims for Revolutionists', in *Man and Superman* (Cambridge, 1918), p. 241.

[2] Thomas P. Hughes, *Networks of Power: electrification in western society* (Baltimore, London, 1988), pp 1-2.

[3] Bruno Latour, *Reassembling the social: an introduction to Actor-Network-Theory* (Oxford, 2005), pp 70-2.

economic, social, cultural, political and technological factors shape the development of technological systems.[4] Thus, while the central concern of this chapter is to outline the development of electrical telegraphy and its implementation in Ireland, this will be done with regard to the wider factors that shaped this development.

This chapter shall examine the early development of the electro-magnetic telegraph in Britain and the relationship between the telegraph and the railway. It shall then trace the spread of this technology to Ireland and its effects upon transatlantic communication. Ireland in the period under investigation occupied a unique position within the United Kingdom: geographically separated from the larger island in the archipelago, possessing an economy that had not, for the most part, undergone significant industrialisation. This chapter will seek to explain why telegraphy developed on the island in the manner that it did. Hence it will place the implementation of the telegraph in a broader economic, social and political context; thus, allowing a greater understanding of how Ireland's unique position within the United Kingdom made an impact upon telegraphic implementation.

Development of technology

The quest to use electricity to produce a means of rapid communication had been on-going since the eighteenth century. Claude Chappe, the inventor of the French optical telegraph, had experimented with electricity before turning to mechanical telegraphy (see chapter I). Prior to the 1830s multiple experiments had been undertaken in the application of electricity to communication.

In 1816 Sir Francis Ronalds published an account of his experiments in using static electricity for communication. Rolands had laid cable back and forth between

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[4] Donald MacKenzie and Judy Wajcman, 'Introductory essay: the social shaping of technology' in Donald MacKenzie and Judy Wajcman (eds), *The social shaping of technology* (2 ed., Maidenhead, 2011), pp 3-27.

two frames, using metal hooks and silk to insulate the iron wire, to create a twelve kilometre telegraphic line (fig. 2.1). Two pith-ball electrometers were connected to this line; the pair of balls on each electrometer would separate when they were in receipt of an electrical charge. When a Leyden jar was attached to the line it was noted that both pith-ball electrometers energised simultaneously and likewise when the electrical current was discharge, by the touching of a hand to earth it, the pith-balls touched each other, proving the instantaneous nature of the electrical current. [5]

A & B Wooden frames

C Air pistons, placed at both ends of the wire at D & E

D & E Ends of wire at which was placed two pith ball electrometers

F Leyden jar

Fig. 2.1 Sir Francis Rolands' experiment with static electricity for communication
Source: Francis Rolands, *Descriptions of an electrical telegraph* (London, 1823), frontispiece.

Ronald then attempted to construct a working telegraph. A four-foot deep, 525-feet long trench was dug and into it was laid a wooden trough which was lined inside and out, with pitch. The telegraph wire, contained in glass tubes for insulation,

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[5] Francis Rolands, *Descriptions of an electrical telegraph* (London, 1823), pp 1-4.

was placed inside. At each end of the line Rolands placed a 'cylindrical electrical machine'[6], to create a static charge, and a pith-ball electrometer alongside two synchronised devices that used a rotating dial to show the numbers one to ten and the letters of the alphabet, excluding J, Q, U, W, X and Z, one symbol at a time (fig 2.2). When the letter that the operator wished to send appeared on the device, the current in the line would be discharged and the separated pith-balls at the other end would instantaneously collapse. Upon this signal the other operator would record the letter that appeared on their device. This process would be repeated until the complete message was sent. [7]
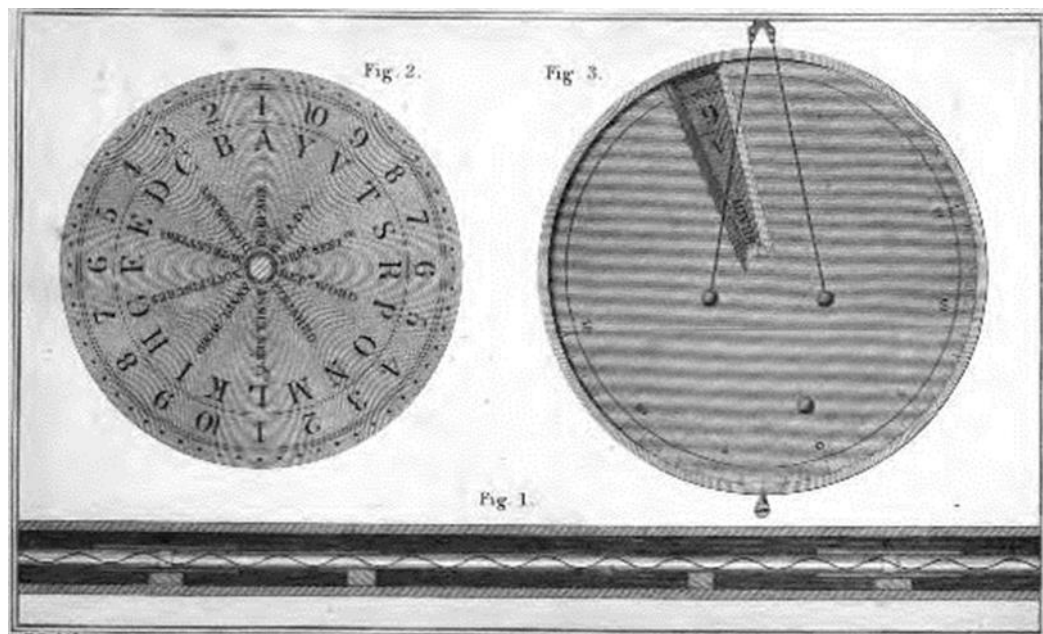
Fig. 2.2 Synchronised dial for use on Francis Ronalds' telegraph, dial on left showing just one letter/number at a time
Source: Rolands, *Descriptions of an electrical telegraph,* p. 7.

Ronald's experiments demonstrated that electricity could be used for the rapid transmission of information and that electrical wires could be properly insulated. However, this cumbersome technology was not practical for long-distance communication due to the need to keep the dial devices synchronised. This was

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[6] Rolands, *Descriptions of an electrical telegraph*, p. 7.
[7] Ibid., pp 6-8.

demonstrated in Ronalds' unsuccessful attempts to have his system implemented; his approaches to the Admiralty, which was content with its optical telegraph, proved unsuccessful.[8]

In tandem with experiments using static electricity were attempts to adapt the electric pile for use in a practical telegraph. The electric pile developed by Alessandro Volta in 1800 gave scientists a reliable source of electricity to experiment with.[9] In 1820 the Danish physicist Hans Christian Oersted accidentally discovered that the needle of a compass, when in proximity to an electrical wire, turned at a right angle to the direction of the electrical current. This work was advanced by the French scientist Andre Marie Ampère who established the field of electro-dynamics.[10] This was the starting point in the development of the needle-based telegraph, which used electro-magnetism to move a magnetised needle which spelt out messages. While there were many men who contributed to the development of the needle telegraph the two names that stand out in a British context are those of Charles Wheatstone and William Cooke. These were responsible for the development of a practical telegraph that would lead to a telegraphic web spreading out to connect, firstly, the British Isles and, then, the world.

Cooke had witnessed the operation of a needle telegraph similar to that design by the Russian Pawel Lwowitsch Schilling at a lecture given by Professor G. W. Muncke at Heidelberg University in 1836. This was a damascene moment in Cooke's life and within a matter of weeks he had constructed his first telegraph. Cooke, with limited knowledge of electricity, was unable to advance his design and sought the help of Charles Wheatstone—then a professor at King's College, London—to develop his prototype. Wheatstone had also been in the process of

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[8] J. L. Kieve, *The electric telegraph, a social and economic history* (Newton Abbot, 1973), p. 16.
[9] K.G. Beauchamp, *The history of telegraphy* (London, 2008), p. 23.
[10] Kieve, *The electric telegraph,* pp 14-5.

experimenting with telegraphic communication. Hence, the two entered into a partnership in which Wheatstone provided most of the scientific and technological input, while Cooke managed the business end of their relationship. In June 1837 they patented their first telegraph. This was a six-wire, five-needle instrument which displayed twenty letters. Their telegraph sent current along two of the wires which cause two of the needles to point to the correct letter. Not only was this system effective but also quite simple to use (fig. 2.3).[11]
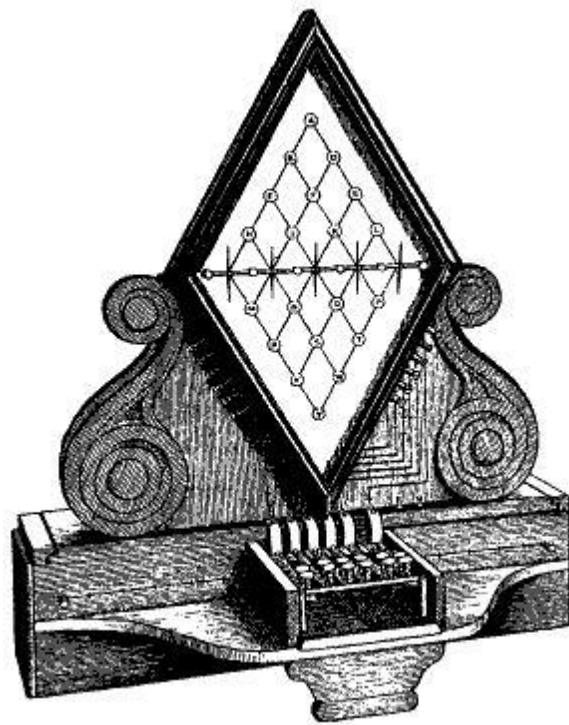
Fig. 2.3 Cooke and Wheatstone five-needle telegraph
Source: *Official Catalogue of the Great Exhibition, 1851* (London, 1851)

The telegraph, a new and wondrous technology that seemed to defy the laws of nature, formed a partnership with another marvel of the Victorian era: the railways.[12] The telegraph offered many advantages for the emerging rail network.

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[11] Beauchamp, *History of telegraphy,* pp 25-31; Kieve, *The electric telegraph,* pp 17-9; Cooke forms partnership with Wheatstone (1837): 'we can do better than this', available at Connected Earth, journeys, first generation technologies, the telegraph (http://www.connected-earth.com) (11 Oct. 2016).

[12] I.R. Morus, 'The electric Ariel: telegraphy and commercial culture in early Victorian England', p. 341.

Firstly, many early railways used stationary engines either instead of mobile locomotives or, on a steep gradient, to supplement locomotive power. These fixed engines could be difficult to operate with high running costs. The electric telegraph could alert fixed engines when carriages were on the line thus conserving fuel, aid in the management of arrivals and departures on lines with multiple stations, as well as the general organisation of the railway and movement of goods. Another important aspect of the telegraph was the contribution it could make to railway safety particularly in tunnels, where lack of visibility made them especially vulnerable.

This focus on the railway as the natural customer for the telegraph can be seen in Cooke's publication *Telegraphic railways*. This work's expansive title demonstrates two things, firstly, the wealth of potential tasks that the new telegraph could undertake and, secondly, that Cooke, being a diligent businessman, was prepared to sell his telegraph to anyone and everyone who could be persuaded to buy it. Cooke, quick to highlight the advantages to railway operators, stated that the telegraph would improve the safety and efficiency of the railway to such a degree that single-track lines 'may become an efficient, and most economical substitute for the double way.'[13] Telegraphs would allow the construction of single-track lines where double tracks were not economically feasible and, thus, provide the '*maximum* [sic] degree of safety with the *minimum* [sic] cost of construction'.[14]

While Cooke was well aware of the advantages that telegraphy would accrue to the railway companies his interests in them also had other motivations. The railway companies had vast tracts of land which criss-crossed Britain, offered protection from interference and connected the major centres of industry and trade.

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[13] W. F. Cooke, *Telegraphic railways, or the single way recommended by safety, economy, and efficiency under the safeguard and control of the electric telegraph: with particular reference to railway communication with Scotland, and to the Irish railways* (London, 1842*)*, p. 3.
[14] Cooke, *Telegraphic railways,* p. 3.

Cooke, if successful, in implementing telegraphic communication along the railway network would be able to use this system to provide a commercial telegraph connecting these industrial and trading centres. For Ireland with many districts unable to support a double-track railway line the telegraph's use in ensuring the safety of single track lines was appealing to many.[15]

In Ireland the application of telegraphy to the railway was undertaken early in the technology's development. In 1844 construction was completed on an extension to the Dublin to Kingstown Railway; this Kingstown to Dalkey branch line was powered by atmospheric as opposed to locomotive propulsion. The atmospheric carriages ran on a single track between which was laid a fifteen-inch pipe that was connected to a stationary engine based in Dalkey. This engine removed the air from the pipe to create a vacuum, which in-turn propelled the carriages by means of a piston connected to a 'leading car'.[16] The extremely large engine—with two thirty-six-feet flywheels—was driven by a five-foot, seven-inch wide air-pump cylinder and was powered by three boilers measuring five foot, six inches in diameter and thirty-six feet in length which used one tonne of coal every three hours.[17]

When the carriages was ready to leave Kingstown they were pushed by the attendants down the short decline at the station until the piston connected with the atmospheric pipe which propelled the carriages to Dalkey, a journey which included what was considered to be a large incline. When the carriages passed a certain point the engine would cut power to the atmospheric pipe and momentum would bring the carriages into Dalkey. The engine operator was alerted to the position of the train by

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[15] Charles C. Adley, 'On the value of the telegraph in economising the working of a line of railway' in *The Transactions of the Institute of Civil Engineers of Ireland*, iv, part iii (1855), pp 51-90, at p. 62.

[16] Kevin Murray, 'The atmospheric railway to Dalkey' in *Dublin Historical Railway,* v, no. 3 (1943), pp 108-120, at p. 113.

[17] James Scannell, 'From Kingstown to Dalkey by air' in *Dublin Historical Record,* lxii, no. 1 (2009), pp 83-97, at p. 90; Murray, 'The atmospheric railway to Dalkey', p. 113.

the trusted and high-tech method of placing a boy at the engine house's upper-room window as a lookout.[18]

As the engine was considerably too powerful an electric telegraph was included in the construction proposals to inform the stationary engine when to apply power and thus reduce running costs. The trains ran four times an hour, twice in each direction. As the return trip from Dalkey was powered by the gravitational pull of the gradient, the engine only needed to be in operation twice an hour. [19] In practice the Kingstown and Dalkey railway rarely used its telegraph, with the operators relying upon the clock, to start the engine, and the look-out boy, to stop it, to regulate their work. The requirement for telegraphic communication would become more apparent when the technology was adopted in Britain.

For investors in Britain atmospheric railways had a number of advantages. Firstly, with stationary engines every few miles there was no chance of collision as two trains could not be in the same stretch of track at once or go in opposite directions. Secondly, atmospherics were considered to be more economical and adapt at climbing steep gradients than locomotives. On these extended lines the telegraph would be relied upon to communicate with engines in order to facilitate stations stops and conserve fuel.[20] Unfortunately, these fixed lines quickly failed due to technical difficulties and improvements in locomotive design and reputation. Also responsible was the application of telegraphic technology to locomotive railways that had been taking place alongside its use on stationary engine railways.

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[18] *Freeman's Journal,* 30 Aug. 1845.
[19] J. Samuda, 'Atmospheric railways' extracts from a paper given at the Institution of civil engineers, in *Freeman's Journal,* 18 May 1844; Advertisement, 'Atmospheric railway' in *Freeman's Journal,* 26 March 1844.
[20] R. A. Buchanan, 'The atmospheric railway of I. K. Brunel' in *Social Studies of Science,* xxii, no. 2 (1992), pp 231-43, at p. 239.

Cooke's telegraphic system divided the railway track into sections with a station at each division. When a train was about to enter a section of track the station would telegraph along the line so that each station would know the location of every train, thus ensuring that each section of track was occupied by only one train.[21] This arrangement was the essence of the block-signalling system that is still in use to this day. Cooke's system allowed for the proper management of the railway, was flexible, reduced construction costs, meant more traffic could use the line and greatly improved the safety of the railway. It was for these reasons that the telegraph quickly became synonymous with the railway. The next step in the telegraph's development was its commercial application to non-railway uses.

The early 1840s saw the gradual adoption of the telegraph by multiple railway operators. On-going with this was the deterioration and dissolution of Cooke and Wheatstone's business relationship. With this dissolution, Cooke, George P. Bidder and John Lewis Ricardo founded the Electrical Telegraph Company (ETC) in 1846, to operate the patents of Cooke and Wheatstone.[22] John Lewis Ricardo, who was M. P. for Stroke-on-Trent, would be the company's chairman for the following ten years.[23] Bidder, a prominent engineer, with interests in railways as well as telegraphs would remain with the company until nationalisation in 1870.[24] In 1844 a telegraph was laid between Nine Elms and Gosport to connect the Admiralty in Whitehall with Portsmouth and its success led to the laying of a 300-mile line

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[21] Cooke, *Telegraphic railways*, p. 21.
[22] Kieve, *The electric telegraph,* pp 41-2.
[23] W. A. S. Hewins, 'Ricardo, John Lewis (1812–1862)' in *Oxford dictionary of national biography*, (Oxford, 2004), available at (http://www.oxforddnb.com) (11 Oct. 2016).
[24] H. T. Wood, 'Bidder, George Parker (1806–1878)' *in Oxford dictionary of national biography*, available at (http://www.oxforddnb.com) (11 Oct. 2016).

connecting London to Holyhead. This telegraph, laid by the ETC, significantly increased communication speeds between London and Ireland.[25]

The effect of the London to Holyhead telegraph was demonstrated in the *Freeman's Journal*, 1 February 1850, when it published the Queen's speech on the occasion of the opening of parliament. The sub-title of the article was 'Extraordinary Dispatch. Freeman Office, Thursday. Quarter-past Eleven o' Clock, PM'.[26] The speech had been delivered on Thursday 31 January by the Lord Chancellor. It was then relayed by telegraph to Crewe, Cheshire East, and from there to Holyhead using the Chester and Holyhead Railway. Here the steamer *Cambria* was awaiting the message and left immediately for Kingstown (Dún Laoghaire) arriving there at 11.15 am. This represented a revolution in communication times and with the telegraph completed to Holyhead, alongside the regular steam packet between Dublin and Holyhead, Ireland was becoming temporally much closer to London.

The ETC won numerous contracts to build telegraph lines and by November 1848 over 1,800 miles of railway had telegraphic coverage, a figure that represented approximately fifty percent of the railways then in operation in Britain. These figures did not translate into massive profits as the principal customer was still the railway companies. However, from 1849 onwards the prospects of the company improved significantly with increased revenue. This improved economic climate also lead to the formation of other telegraph companies such as the British Electrical Telegraph Company (BETC) in 1850.[27]

While the future of inland telegraphy seemed assured in Britain this was not the case in Ireland. Here there was little progress in the construction of telegraphs and until there was a reliable means of laying and operating submarine telegraphs,

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[25] Kieve, *The electric telegraph,* pp 37-8.
[26] *Freeman's Journal,* 1 Feb. 1850.
[27] Kieve, *The electric telegraph*, pp 48-51.

the island would remain isolated from the rest of the United Kingdom. Indeed, this conundrum had to be answered before the telegraph could become a tool of international communication. For Britain with its trade links to the European mainland, America and its, formal and informal, overseas empire, this would prove to be a valuable technological breakthrough.[28]

The main difficulty with attempts to send a signal through a submarine cable was finding a suitable insulating material. Multiple methods of insulation were experimented with; however, even the most obvious choice, rubber, proved to be a short-lived success as it rapidly lost its insulating properties in water and was prone to attack by organic elements such as bore worms. The solution to these difficulties was a rigid latex, named gutta-percha. This was flexible when heated, provided insulation for the current and, unlike rubber, maintained its insulating properties when submerged.[29]

The first major submarine cable to use gutta-percha as insulation was laid by the Submarine Telegraph Company, across the English Channel from Dover, England, to Calais, France, in 1850. The cable was forty-kilometres long, with a twelve-millimetre coating of gutta-percha and consisted of one copper wire. This protective coating was quickly destroyed[30] and the following year a new *armoured* cable, constructed by R. S. Newall, was laid across the channel. This cable was

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[28] For more on the importance of the telegraph to empire see D.R. Headrick, *The tools of empire: technology and European imperialism in the nineteenth century* (Oxford, 1981), pp 157-64; D.R. Headrick, *The invisible weapon* (Oxford, 1991).
[29] Beauchamp, *History of telegraphy*, pp 135-8; Bruce Hunt, 'Insulation for an Empire: Gutta-Percha and the Development of Electrical Measurement in Victorian Britain' in F. A. J. L. James (ed.) *Semaphores to Short Waves* (London, 1998), pp 85–104, at pp 85-6, 88-9; Bruce J. Hunt, 'Doing science in a global empire: cable telegraphy and electrical physics in Victorian Britain' in Bernard Lightman (ed.), *Victorian Science in Context* (Chicago, 1997), pp 312-33, at p. 316;
[30] T. P. Shaffner, *Shaffner's telegraph companion, devoted to the science and art of the Morse American telegraph* (2 vols, New York, 1854), i, p. 199.

insulated with gutta-percha and incorporated an outer protective layer of iron wire; it was to remain the basic design of submarine cables for the rest of the century.[31]

Difficulties with submarine telegraphy were to continue into the late 1850s, and indeed beyond; the failure of the first transatlantic telegraph cable in 1858 providing the impetus to improve and standardise telegraph cable production.[32] Despite these difficulties, Ireland was to benefit from a telegraphic connection to Britain which would see a surge in the use of telegraphs in Ireland and greater connectivity between the islands.

In 1850, prior to the laying of a telegraph cable between Ireland and Britain, Ireland possessed only five miles of telegraph line in comparison to 2,215 miles in the rest of the United Kingdom.[33] This raises the question as to what structural factors were at play that had led to this underdevelopment of the technology on the island in comparison to Britain.

During the nineteenth century Irish living standards were to rise, although they remained below British levels. This was particularly true in the period after the famine, 1845-9, when a reduction in the agricultural labour force due to emigration and improved agricultural prices saw an increase in money wages by agricultural

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[31] Beauchamp, *History of telegraphy*, pp 139-40.
[32] C.A. Hempstead, 'The early years of oceanic telegraphy: technology, science and politics' in *IEE Proceedings A - Physical Science, Measurement and Instrumentation, Management and Education*, cxxxvi, issue 6 (Nov., 1989), pp 297-305, at pp 299-300, 301-2; C.A. Hempstead, 'An appraisal of Fleeming Jenkin (1833-1885), electrical engineer' in *History of Technology,* xiii (1991), pp 119-44, at pp 131-2; Bruce J. Hunt, ' Doing science in a global empire: cable telegraphy and electrical physics in Victorian Britain', pp 317-9; see also Bruce J. Hunt, 'Scientist, engineers and Wildman Whitehouse: measurement and credibility in early cable telegraphy' in *The British Journal for the History of Science,* xxix, no. 2 (Jun., 1996), pp 155-69; Bruce J. Hunt, 'The Ohm Is Where the Art Is: British Telegraph Engineers and the Development of Electrical Standards' in *Osiris,* ix, 2nd series (1994), pp 48-63; Bruce J. Hunt, 'Michael Faraday, Cable Telegraphy, and the Rise of British Field Theory' in *History of Technology*, xiii, no. 1 (1991), pp 1–19.
[33] Willoughby Smith, 'A resume of the earlier days of electric telegraphy', in *Journal of the Society of Telegraphic Engineers and Electricians*, x (1881), pp 314-15, in Cullen, 'Local government and the management of urban space', p. 217.

workers.[34] For example, by the 1870s tobacco and tea consumption in Ireland was near English levels. These new levels of consumption increased the number and importance of shops. This in turn enhanced the importance of towns as commercial and wholesaling centres. Added to this was increased competition between wholesale merchants in the main port towns of Dublin, Belfast and Cork, and those in provincial towns. This was all made possible by the introduction of steamers to the Irish Sea and trains in both Britain and Ireland.[35] Many of these consumer products were either products of the empire, such as tobacco and tea, or of an industrialised Britain, such as cheaper clothing and tools. Due to this changing economic and commercial reality, access to information from Britain, such as the prices of goods, became much more important in this period.

In addition, after years of lagging behind Britain in terms of industrialisation, Ireland was in possession of a completely different economy to that its neighbouring island. In Britain localised and specialised industries had developed in different regions that had become world-leaders in the exportation of their relevant produce. Due to this British industry and trade would be boosted by a technology that improved communication between manufacturers, suppliers and merchants. In Ireland what industry was remaining served a purely local market. The main economic growth sectors in Ireland during the same period were agriculture and agri-industries, that is industries involved in the processing of agricultural goods for export. For example, despite falling grain production Irish mills continued to be

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[34] Cormac Ó'Gráda, *Ireland: a new economic history, 1780-1939* (Oxford, 1995), pp 236-8; L.M. Cullen, *An economic history of Ireland since 1660* (2nd ed., London, 1987), p. 156.
[35] Cullen, *An economic history of Ireland since 1660,* pp 138, 140, 142-4, 153, 156.

significant exporters well into the nineteenth century, mainly through the importation of grain for milling.[36]

Due to the differences between the two economies, internal communication was not as important to Ireland as it was to Britain. Irish trade with its reliance on agricultural exports to, and industrial imports from Britain would instead require connectivity with Britain in order to make a telegraph network commercially viable. This connection providing a rapid means of communication for the island with its markets, both in Britain and beyond, while competition in trade and commerce made the information supplied by the telegraph invaluable for commercial ventures.

The main exception to this general stagnation of industry was Belfast, and the surrounding area. It was to experience substantial industrial growth during the nineteenth century. In particular, linen production was to become a major industry. The linen trade was very reliant on exportation and had built up a beneficial relationship with the Scottish linen industry during the first half of the nineteenth century. This saw much exportation and importation of linen between these two regions and, thus, linen producers could benefit from access to information concerning prices and stock availability. Belfast had become an important centre for shipbuilding; by the 1910s Harland & Wolff and Workman Clark, both Belfast-based ship builders, were producing over 150,000 tons of shipping. This was eight percent of global output. The fact that these enterprises needed to import coal, steel and timber[37] meant that rapid communication could benefit the industrial development of the city. It has been noted that industry in the north-east of Ulster co-

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[36] Cullen, *An economic history of Ireland since 1660,* pp 146, 155-8; Ó'Gráda, *Ireland: a new economic history, 1780-1939,* pp 306-13.
[37] Ó Gráda, *Ireland: a new economic history, 1780-1939,* pp 285-7, 295-6.

operated more with other industrial regions in the north of England and Scotland than with other parts of Ireland.[38]

The impact that British industrial goods had on Irish industry was significant and an Irish industrial crisis was to emerge in the 1870s—the end of the world-wide boom in 1874 lead to a dumping of British industrial goods on the Irish market. However, the coming crisis could be seen in the preceding years as British industrial goods slowly infiltrated the Irish market. The communication revolution of the 1850s, in terms of steamers, trains[39] and, this thesis would argue, telegraphy, was to significantly aid this transformation of the Irish economy.

In Britain, the potential value of telegraphic information to commercial ventures had been noted by a parliamentary committee as early as 1840.[40] As Ireland's internal industrial base was weak, the requirement for the rapid communication of commodity, stock and market information was not as central to business as in Britain. However, for an Irish economy with a focus on agricultural exportation to Britain and the importation of the industrial goods and raw materials of both Britain and the wider British empire telegraphic connectivity to that island, and the information that it relayed, would be of extreme importance for firms seeking to maintain their competitiveness and the highest prices for their produce. Hence, the connection of Ireland to Britain was the essential driving factor in the rapid expansion of telegraphy that the island was about to witness.

Several companies were to attempt to telegraphically connect Ireland and Britain. Of these the first to try to lay a cable was the Irish Channel Submarine Telegraph Company. This company, which had close links to the Electric Telegraph

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[38] Philip Ollerenshaw, 'Industry, 1820-1914' in Liam Kennedy and Philip Ollerenshaw (eds), *An economic history of Ulster, 1820-1940* (Manchester, 1985), pp 62- 108, at p. 62.
[39] Cullen, *An economic history of Ireland since 1660*, pp 146-8.
[40] I. R. Morus, 'The electric Ariel: telegraphy and commercial culture in early Victorian England', p. 363.

Company (ETC), laid a cable between Holyhead and Howth in June 1852. The cable constructed by Messrs. Newall & Co. was of an armoured design, which enclosed one copper conducting wire. It weighed less than one-ton-per mile, in comparison to the seven-ton-per mile of the Dover and Calais cable of the previous year, and was to fail after three days of operation.[41] Edwin Clark, manager of the ETC, was hopeful that the island would be connected to Britain before the Great Industrial Exhibition, allowing for communication to take place between Dublin and London during that event.[42] Unfortunately it was not to be. Later that same year the company, renamed the Electric Telegraph Company of Ireland, attempted to lay a cable between Portpatrick, Scotland and Donaghadee, Ireland, however this was to fail during the laying operation and the company subsequently collapsed through lack of funds.[43]

The English and Irish Magnetic Telegraph Company (E&I MTC) was established in 1852 to operate the patents of William Thomas Henley and David George Foster. These patents were essential to overcome the ETC's monopoly on telegraphic communication. In principle Henley's design consisted of a magnetic needle placed between two pieces of soft iron which projected from 'a pair of small electro-magnetic coils—to obtain with the motion of the lever a backward and forward movement of the needles.' Most of the original shareholders of the E&I MTC were Liverpool merchants, with some shareholders from elsewhere including Dublin.[44]

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[41] T. P. Shaffner, 'Submarine telegraphs of the world' in T.P. Shaffner, *Shaffner's telegraph companion, devoted to the science and art of the Morse American telegraph* (2 vols, New York, 1854), ii, pp 321-43, at pp 327.

[42] Adley, 'On the value of the telegraph in economising the working of a line of railway', p. 63.

[43] Thomas Wall, 'Some notes towards a history of telecommunications with particular reference to Ireland' Unpublished paper, 2005 (NLI, call no. 5B 180), pp 130-2.

[44] Deed of settlement of the English and Irish magnetic telegraph company, 16 Aug. 1852 (BT archive, TCN/1/1/2); Events in telecommunication history, 1852, British Telecom archive (http://www.btplc.com/Thegroup/BTsHistory/1851to1880/1852.htm) (11 Oct. 2016); Edward B. Bright, 'Answers to Mr. Shaffner's questions', in Shaffner, *Shaffner's telegraph companion,* ii, p. 216.

The E&I MTC sought to construct a telegraph network spanning the British Isles which would connect 'London and Dublin and the various towns of Great Britain and Ireland and with the submarine telegraph at Dover and with other lines in Great Britain.' For Ireland it was expected that this telegraphic link would lead to 'commercial and social improvements.'[45] Telegraphy, as was seen in Britain, aided in the distribution of commercial; financial, including stock prices; political and other intelligence.[46] Given the lack of appetite for telegraphy prior to the laying of a submarine cable, this thesis argues that, the central factor in the development of the network was connectivity to Britain and the financial, commercial and trade information that such connectivity would bring.

Both Kieve and Barton[47] have argued that the focus of the Liverpool linen merchants—the main backers of the E&I MTC—in connecting Ireland to Britain was to allow rapid communication with linen manufactures in Ireland. However, given that the majority of linen production in the country was located in the north-east, extending as far as Dundalk, the extensive network proposed by the E&I MTC would seem to negate this argument somewhat. While there is little doubt that the founders of the E&I MTC where concerned that the industrial north-west of Britain and the north of Ireland should benefit from telegraphy, the connection of the two islands, and the significant costs associated with this undertaking, cannot be ascribed solely to this desire. Thus, the connection of the north of England and Scotland to the industrial north-east of Ireland was important, given the interconnection of the local economies of these areas as outlined above. However, the directors of the E&I MTC

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[45] Deed of settlement of the English and Irish magnetic telegraph company, 16 Aug. 1852 (BT archive, TCN/1/1/2).
[46] Adley, 'On the value of the telegraph in economising the working of a line of railway', pp 62-3.
[47] See Kieve, *The electric telegraph,* and R.N. Barton, 'Construction of the network society: evolution of the electric telegraph 1837-1869' (Ph.D. thesis, Department of Science and Technology Studies, UCL, 2007), p. 243.

were motivated by profit and the connection of these areas and the rest of Ireland to Britain was undertaken to further this aim. In addition, the desire of other companies—who did not have a high concentration of linen merchants as shareholders—to lay submarine cables between the two islands points to a multi-faceted rationale behind the connection of the two islands.

The E&I MTC had at its inception a detailed plan of how to achieve a telegraph network across the British Isles. Telegraph companies relied heavily upon the wayleave rights— wayleave being the right to lay wires—of the physical transport companies, such as the railways and canals. The E&I MTC sought to connect its existing and proposed railway-based telegraph lines to construct a wider commercial network. This demonstrates the technology's movement anyway from a system centred on and operated for the railways to a commercial enterprise whose main focus was on serving merchants and other such enterprises.

At its formation the E&I MTC had telegraph lines on the Lancashire and Yorkshire Railway and East Lancashire Railway. In Scotland the company had contracts to lay lines on all branches of the Caledonian Railway and the submarine cable between Portpatrick, Scotland, and Donaghdee, Ireland. A subterranean wire was to connect the lines on the East Lancashire Railway to those on the Caledonian. While in Ireland it had contracts with multiple railways (fig. 2.4). An underground wire was to be laid from Donaghadee to the Belfast and County Down Railway and from here a telegram could be relayed through any of the railway-based telegraphs in Ireland; thus, forming a commercially viable telegraph network spanning the British

Isles. As outlined above, the close relationship between the telegraph and the railway was to have an impact on the areas to be serviced by this new technology. [48]

In its dealings with the railway companies the E&I MTC normally entered into an arrangement to supply and maintain telegraphs for a nominal charge, in return for wayleave rights for its own commercial lines. In Ireland, for example, the Dublin and Drogheda; Dublin and Belfast Junction; Ulster; and the Belfast and County Down railways were each given 'the use of two lines and instruments free of charge in consideration of their permitting right of way.' While the Midland Great Western Railway and the E&I MTC split the cost of 'clerks at the principal stations' in exchange for wayleave rights.[49]

By 1853 considerable progress had been made on the construction of the E&I MTC's network. In Ireland, the telegraph on the Midlands Great Western Railway was in operation and construction was underway on the other railway lines. In England the London and Manchester line was under construction. But there was still a considerable amount of work to be completed (fig. 2.5).

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[48] Thomas Milner, English and Irish magnetic telegraph company correspondence, 17 Aug. 1852 (BT archive, TGN/1/1/3).
[49] Thomas Milner, English and Irish magnetic telegraph company correspondence, 17 Aug. 1852 (BT archive, TGN/1/1/3).
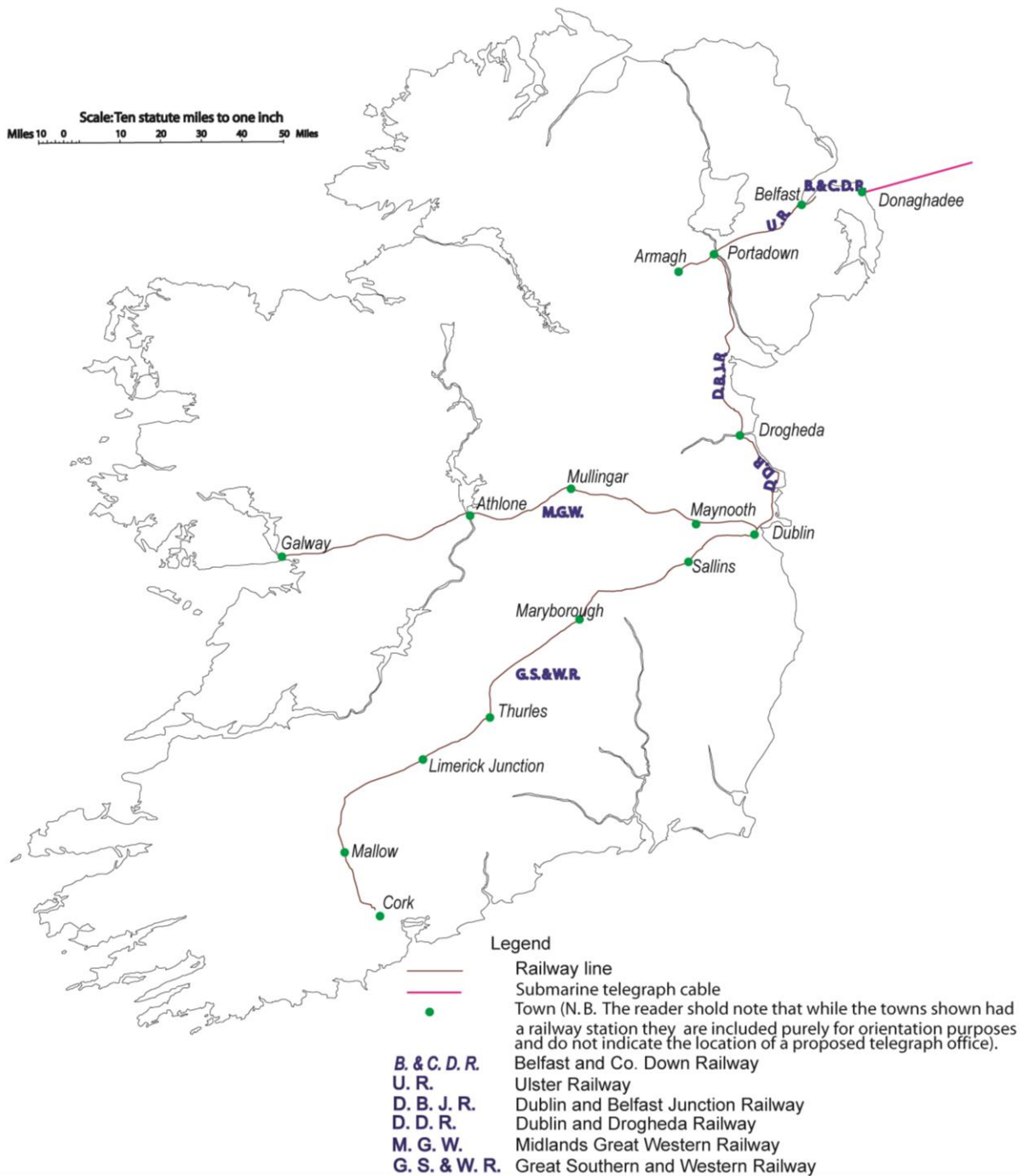
Fig. 2.4 Railway lines proposed to carry telegraph lines of the proposed network of the English and Irish Magnetic Telegraph Company's proposed Irish network, 1852
Drawn by A.J. Kirwan from data provided by Thomas Milner, English and Irish magnetic telegraph company correspondence, 17 Aug. 1852 (BT archive, TGN/1/1/3).
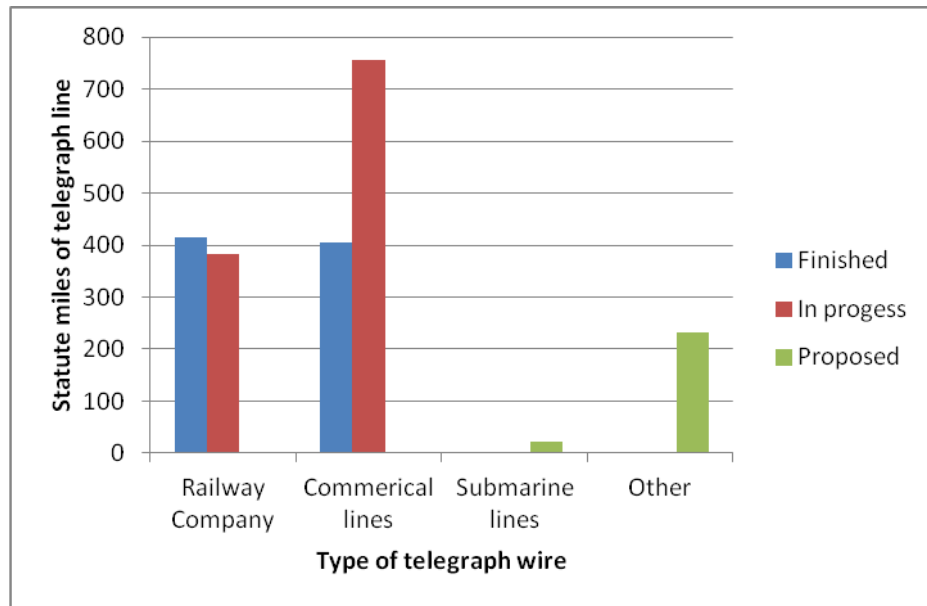
Fig. 2.5 Progression of construction of the English and Irish Magnetic Telegraph Company's UK telegraphic network, 3 January 1853
Compiled by A. J. Kirwan from data provided by Thomas Milner, English and Irish Magnetic Telegraph Company correspondence, 3 Jan. 1853 (BT archive, TGN/1/1/3).

Following a failed attempt, between Donaghdee and Portpatrick, by the E&I MTC the previous year a submarine cable was successfully laid on 23 May 1853. The 180-ton cable was laid using the screw streamer, the *William Hunt* and two tugs, the *Conqueror* and the *Wizard*, under the supervision of Captain Hawes who had been deputed by the Royal Navy.[1] The cable ran from Donaghadee, Ireland, and was landed at Port Mora, just north of Portpatrick, Scotland. On the Scottish end a subterranean cable was laid to Coy's station, Carlisle, in order to link it to the E&I MTC's British telegraph network. In Ireland the cable was to be connected to the terminal station of the County Down Railway at Newtownards,[2] then run to 'Magnetic Company's [E&I MTC] station on College-Green, Dublin' and from there

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[1] *Freeman's Journal,* 27 May 1853; Beauchamp, *History of telegraphy*, pp 140-1.
[2] Edward B. Bright, 'Answers to Mr. Shaffner's questions', pp 218-9; *Freeman's Journal,* 27 May 1853.

to the rest of the network.[3] This cable in addition to the retrieval of the earlier failed

cable provided the impetus needed to drive a massive expansion in Irish telegraphy.[4]

The E&I MTC's success in crossing the Irish Sea spurred interest from other

companies. The ETC renewed attempts to cross the channel in 1854 with a failed

cable attempt between Howth and Holyhead; it would successfully lay a cable

between these two points the following year. While this cable was to finally connect

the ETC's British operations to Ireland it was to fail in 1860; it was repaired but

failed again in 1864 and this time was left in disrepair. The other competitor in this

cross-channel trade was the British Electrical Telegraph Company (BETC) which

successfully laid a submarine telegraph cable between Donaghdee and Portpatrick in

1854.[5]

The construction of the E&I MTC's network exposed the difficulties that

arose due to wayleave rights. In Britain the Electrical Telegraph Company (ETC), as

the longer established entity, had exclusive contracts with a large portion of the

railway companies forcing the E&I MTC to resort to the use of subterranean wires

(fig. 2.6). These were expensive to construct. The estimate for the London to

Manchester line was from £24,000 to £35,000,[6] but preferred to the other option of

running lines alongside the old mail-roads. Such lines were prone to 'malicious

injury'[7] and many restrictions were placed on their laying and maintenance. These

trunk lines were highly profitable and, as such, the company could ill afford one to

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[3] *Freeman's Journal,* 27 May 1853.
[4] Charles T. Bright, 'Answers to Mr. Shaffner's questions', in Shaffner, *Shaffner's telegraph companion,* ii, p. 205.
[5] Thomas Wall, 'Some notes towards a history of telecommunications with particular reference to Ireland' Unpublished paper, 2005 (NLI, call no. 5B 180), pp 130-3.
[6] Thomas Milner, English and Irish magnetic telegraph company correspondence, 17 Aug. 1852 (BT archive, TGN/1/1/3).
[7] Edward B. Bright, 'Answers to Mr. Shaffner's questions', ii, p. 208.

be rendered inoperable; the one connecting Manchester, Birmingham and Liverpool had an estimated turnover of £27,000, and profit of £10,730.[8]

In Ireland as the first provider of telegraphic communication the E&I MTC was able to gain wayleave rights from the railway companies, allowing it to construct much cheaper overhead lines (fig. 2.7). However, the relative sparseness of railway infrastructure on the island in comparison to Britain was to have an impact on the development of the telegraph network, as it was for the most part restricted to railway lines. The motivations of the companies involved in the early expansion of telegraphy also shaped the development of the network. The secretary of the E&I MTC, Edward B. Bright, felt that only the large towns yielded a profit for the telegraph companies. The company would not extend its lines beyond 'any point where a profit could not be obtained';[9] hence, most of the company's lines had between six and eight stations. Bright felt that the lack of demand for a telegraph station in most towns was due to the 'speedy and excellent'[10] service afford by the post office and the lack of speculative trade in many of towns. This demonstrates not only the factors that encouraged the dissemination of the technology but also those that restricted its spread.

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[8] Memoranda relating to general meeting, 4 Jan. 1852, in English and Irish magnetic telegraph company minutes (BT archive, TCN/1/1/1).
[9] Edward B. Bright, 'Answers to Mr. Shaffner's questions', p. 220.
[10] Edward B. Bright, 'Answers to Mr. Shaffner's questions', p. 220.

Telegraph lines	Length of line in statue miles	Number of wires
London to Liverpool	250	6
Carlisle to Portpatrick	125	6
Belfast to Dublin	105	6
Dumfries to Glasgow	115	6
Cork to Queenstown	16	6
Street work in London, Liverpool, Glasgow, Dublin & others	13	12
Scotish Central, Great Northern and Haigh Colliery Lines	8	4
Total	632	

Fig. 2.6 Extent of English and Irish Magnetic Telegraph Company's subterranean telegraph cables, *c.*1854
Compiled by A. J. Kirwan from data provided by Charles T. Bright, 'Answers to Mr. Shaffner's questions', in Shaffner, *Shaffner's telegraph companion,* ii, p. 181.

Telegraph lines	Length of line in statute miles
Southern and Great Western Railway	150
Dublin, Drogheda and Belfast Junction; and Ulster Railway companies	160
Belfast and County Down Railway	40
Belfast and Ballymena	40
Ballymena and Coleraine Railway	30
Londonderry and Enniskillen Railway	60
Kilkenny Railway	30
Waterford and Limerick Railway	80
Caledonian Railway	200
East Lancashire Railway	100
Killarney Junction Railway	50
Portarlington and Tullamore Railway	30
Total miles of line	1,190
Total miles of wire	7,200

Fig. 2.7 Extent of the English and Irish Magnetic Telegraph Company's over-head telegraph wires, *c.* 1854
Compiled by A. J. Kirwan from data provided by Charles T. Bright, 'Answers to Mr. Shaffner's questions, in Shaffner', *Shaffner's telegraph companion,* ii, pp 181-2.

The E&I MTC's subterranean wires were placed in a 'trough of creosoted Baltic timber' with a galvanised iron-roof and gutta-percha insulation. In urban areas, such as Dublin, the company used cast-iron piping for the protection of the wires as urban trenches were not of regulation depth. At first, this was done using three-inch (diameter) gas pipes through which the wires were pulled. However, this could lead to damage and the requirement to reopen pavements and roads for repairs. The solution was to use a pipe cut in two horizontally. The wire would then be laid

in the bottom part of the pipe before the top section was attached using gutta-percha

as insulation. Maintenance and repair of the network was carried out by linemen

stationed along the railway. On average the E&I MTC had a lineman for every

seventy miles of pole-hung line. These line-men were well paid with wages ranging

from eighteen to twenty-four shillings per week.[11]

A telegraph operator working for the E&I MTC in the 1850s could transmit

between twenty-seven and a half to thirty-five words in a minute. It required one

clerk to send a message but two to receive: one to read the incoming message and

another to write it down.[12] In 1855 an acoustic telegraph, developed by Charles T.

Bright called 'Bright's Bell', was introduced. This reduce the number of operators

used in receiving messages to one and required only one wire to operate; thus

significantly increasing the volume of messages that could be transmitted using the

E&I MTC's existing wires.[13] Telegraph clerks also made use of cyphers for short

words to increase the speed of transmission. This idea of using cyphers to transmit

messages was taken up by many of the telegraph companies' customers, such as

stock brokers and banks. Cyphers were seen as a method of increasing the security of

what, in many instances, could be valuable and sensitive information.[14]

As with the other telegraph companies, the government reserved the right to

have the E&I MTC lay down lines for its use and the company's stations 'should at

all reasonable times be open[ed] for the transmission of intelligence for Her

Majesty's Service'. It was also required to give priority to any messages from the

Board of Trade, the Board of Admiralty, the Lord High Admiral, Her Majesty's

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[11] Charles T. Bright, 'Answers to Mr. Shaffner's questions', pp 194-7.
[12] Edward B. Bright, 'Answers to Mr. Shaffner's questions', pp 210-16.
[13] Charles Bright, *The life story of Sir Charles Tilston Bright, civil engineer, with which is incorporated the story of the Atlantic cable, and the first telegraph to India and the colonies* (Leicester, 1908), pp 21-4.
[14] Edward B. Bright, 'Answers to Mr. Shaffner's questions', pp 210-16.

lieutenant governor and the governor general of Ireland. In addition, it was an express condition of the company's charter 'that at times thereafter and whenever in the opinion of one of Her Majesty's principal secretaries of state for the time being an emergency should have … the entire control over the operations of the said company and transmission of signals should be vested in Her Majesty's government.' These stipulations would allow the Crown, in Britain or Ireland, to assume control of the telegraph network to prevent 'any communications being made or signal given save such as should be directed and authorised'.[15] Such powers were used in Britain, April 1848, to obstruct Chartist communication.[16]

By 1854 the state was making considerable use of the telegraph. In southern England several telegraph lines had been constructed for governmental communication with naval ports. Regular use was also made of the commercial telegraph network to communicate with the 'army, navy and commissariat' and to transmit information between police forces, as well as the relaying of 'orders, countermands and directions' in relation to troop movements.[17]

The continued development of the telegraphic network in Ireland even though driven by private enterprise would give the state increased power, for both the rapid gathering of information and the control of state forces. These stipulations demonstrate that the British government was well aware of the potential importance of telegraphic communication to its administration but, in contrast to its continental contemporaries, trusted its expansion to the private sector in the knowledge that it could commandeer and co-opt its use as needed.

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[15] Deed of settlement of the English and Irish magnetic telegraph company, 16 Aug. 1852 (BT archive, TCN/1/1/2).
[16] Kieve, *The electric telegraph,* p. 18.
[17] Edward B. Bright, 'Answers to Mr. Shaffner's questions', pp 208-21.

By 1856 the E&I MTC's underground wires had begun to deteriorate and were in need of replacement. In order to acquire supplementary lines the E&I MTC merged with British Telegraph Company in 1857 to form the British and Irish Magnetic Telegraph Company (B&I MTC).[18] By the 1860s the B&I MTC had two submarine cables, each with six wires, for communication between Britain and Ireland.[19] The importance of this link was heightened in 1865 when the cost of communication with Britain was reduced to a maximum of 4*s.*, hence allowing greater access to it. Through these cables Irish telegrams could be sent not only to Britain but also, via the Submarine Telegraph Company's wires, from Dover to over 3,500 European telegraph stations. The company's Irish operations, overseen by its Dublin-based committee, continued to expand through the 1860s. This expansion was driven by two factors: the traditional requirements of the railways and commercial telegraph traffic.[20] The B&I MTC network was to expand to include *c.* 130 telegraph stations throughout the island by 1865, but was still mainly restricted to the railway network (fig 2.7).

Ireland had entered a new information era, where rapid telegraphic communication was essential for an urban area seeking to maintain its place in an increasingly connected world. Athy located on the Great Southern and Western Railway line was a town that could reap the many benefits of telegraphic communication. Alongside the obvious advantages to the railway company, these benefits included increased and rapid communication between merchants and suppliers, manufacturers and markets, and business people and financial information.

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[18] Bright, *The life story of Sir Charles Tilston Bright,* p. 25.

[19] Inventions shown by the British and Irish Magnetic Telegraph Company, international exhibition, 1862, in British and Irish Magnetic Telegraph Company inventions (BT archive, TCF/1/4).

[20] Extracts from the minutes of the managing committee of the British and Irish Magnetic Telegraph Company, 20 Mar., 11 Jan. 1864, in Abstract of minutes (BT archive, TGF/1/1).

By December 1862 the B&I MTC's Athy telegraph office had been closed due to unprofitability. The office had remained opened due to a guarantee of forty pound per annum—meaning that if the annual revenue from the office was below forty pound the town commissioners would pay the difference—, this guarantee appears to have been withdrawn.[21] In response the town commissioners attempted to persuade the Electric & International Telegraph Company (E&I TC) to reopen the office. The E&I TC would only do so with 'a guarantee of £50 per annum'.[22] The town commissioners broached the topic again on 3 October 1864, when they empowered the chairman to make arrangements with the B&I MTC to reinstate its telegraph office.[23] This was reopened, by the B&I MTC, on 19 November 1864, in return for a guarantee of forty pounds per annum.[24] A number of such guarantees were given in order to keep telegraph offices open.[25]

While no record exists to demonstrate if a payment was ever made, the episode is in itself quite elucidating as to the perceived importance of telegraphic communication. In addition, it reveals that the B&I MTC was quite prepared to close financially unrewarding offices. This it itself highlights that the company's approximately 130 Irish telegraph offices were busy enough to justify remaining open and, as such, demonstrates the demand in Ireland for telegraphic communication by the 1860s (fig. 2.8).

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[21] Abstracts of minutes of the Dublin Committee of the B&I MTC, 6 Oct. 1864, in Abstracts of minutes (BT archive, TGF/1/1).

[22] The Electric and International Telegraph Company to Athy Town Commissioners, 30 Dec. 1862, letter copied into Minute book of the Athy Town Commissioners, also correspondence re proposed boundary of Athy, c. 1855-91 (NLI, POS 8127).

[23] Minute book of the Athy Town Commissioners, also correspondence re proposed boundary of Athy, c. 1855-91, 3 Oct. 1864 (NLI, POS 8127).

[24] Extracts from the minutes of the managing committee of the British and Irish Magnetic Telegraph Company, 4 Oct. 1864, in Abstract of minutes (BT archive, TGF/1/1); Minute book of the Athy Town Commissioners, also correspondence re proposed boundary of Athy, c. 1855-91, 7 Nov. 1864 (NLI, POS 8127); British and Irish Magnetic Telegraph Company Limited to Athy Town Commissioners, 27 Oct. 1864, letter copied into Minute book of the Athy Town Commissioners, also correspondence re proposed boundary of Athy, c. 1855-91 (NLI, POS 8127).

[25] Abstracts of minutes of the Dublin Committee of the B&I MTC, 18 Feb. 1864, 29 Mar. 1866, 5 & 12 Mar, 1866, in Abstracts of minutes (BT archive, TGF/1/1).
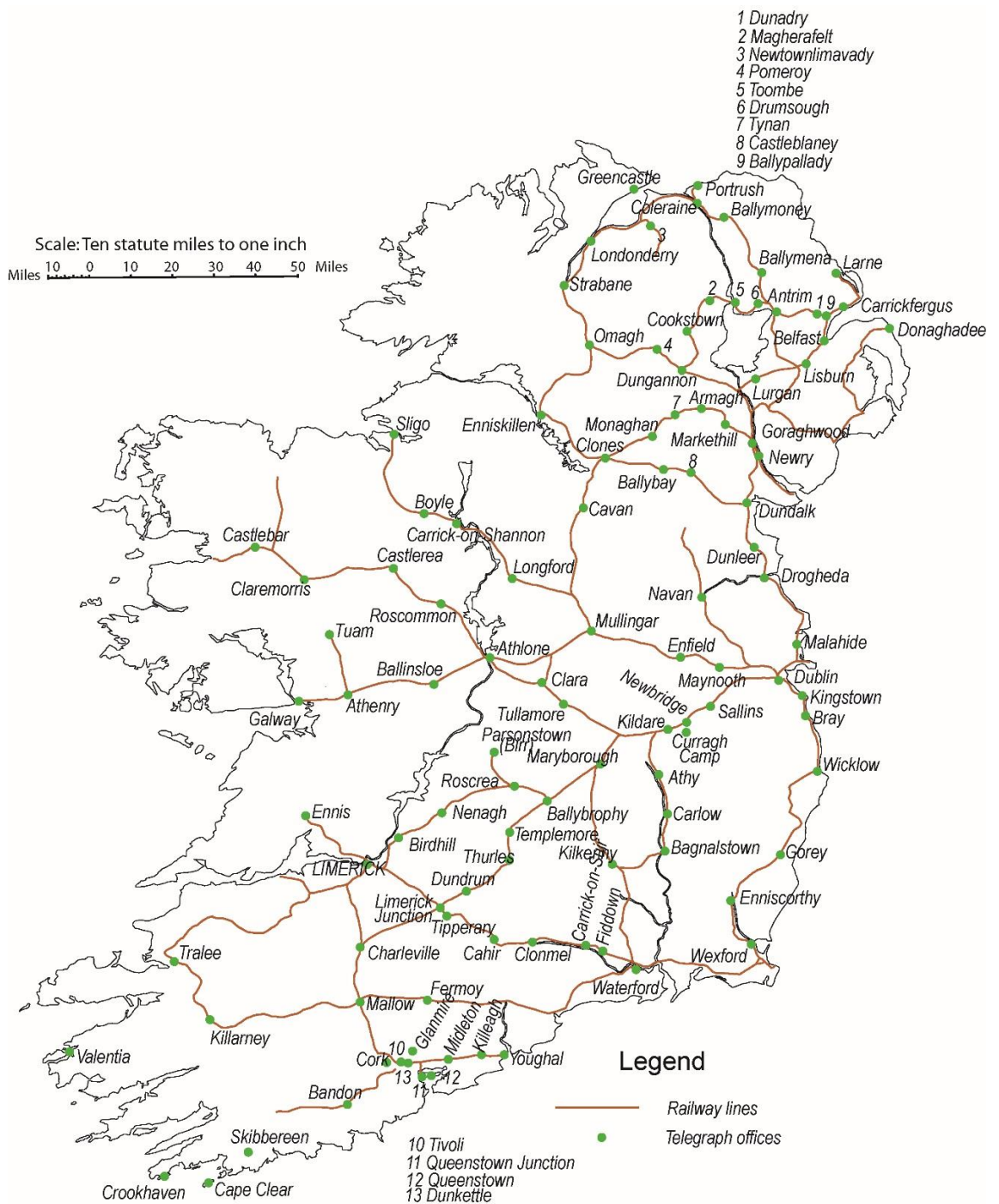
Fig. 2.8 Map showing the position of the British and Irish Telegraph Company's Irish offices in relation to the railway network in 1865
Drawn by A.J. Kirwan from data provided by British and Irish Magnetic Telegraph Company charges (BT archive, TGF/2/1).

While the B&I MTC was the most significant private telegraph company in

Ireland, the Electric and International Telegraph Company (E&I TC), formed in

1855 through a merger of the Electric Telegraph Company and International Telegraph Company, was also active on the island. The E&I TC possessed a submarine cable to communicate between Holyhead, Wales and Dublin, Ireland. Its subsidiary the South-West of Ireland Telegraph Company also had a submarine cable, connecting St. David's Wales to Wexford[26] (with the failure of the Dublin to Holyhead cable in 1860 and again permanently in 1864 the company was reliant on the St. David's to Wexford cable).[27] The E&I TC as a late-comer to Ireland had few railway wayleave rights. Its main telegraph lines in Ireland were one running alongside the Great Northern Railway and another belonging to the South-West of Ireland Telegraph Company running from Wexford to Co. Cork along the roadside.[28] Nevertheless the E&I TC had a number of telegraph offices by 1866 (fig. 2.9).

Due to the uneven coverage of the telegraph companies' networks they often had to rely upon their competitors to transmit messages to their destination. As messages were charged by distance as well as words, a company would use its own lines to transmit a message as far as possible and then rely upon its competitors to complete the journey. The telegraph company's profit would be the difference between the price for the whole distance and the charge of its competitor for the final leg. For example, the cost of a message from Manchester to Cromer was 1*s. 6d.* The E&I TC would transmit the message as far as Norwich, with the B&I MTC transmitting it from there to Cromer for a charge of 1*s.*. Thereby, the E&I TC would

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[26] Kieve, *The electric telegraph*, p. 51.
[27] Wall, 'Some notes towards a history of telecommunications with particular reference to Ireland', p. 133.
[28] The Electric and International Telegraph Company, *Scale of charges* (London, 1866), in Scale of charges (BT archive, TGE/1/7/2), p. 26; *Freeman's Journal*, 23 Jan. 1862

make six-pence profit from the transaction as well as maintaining the goodwill of their customer.[29]

Ireland and transatlantic communication, 1851-1866

Ireland was to become an important node in transatlantic communication long before the successful laying of a transatlantic submarine cable. Ireland with its geographical position as the most westerly part of the British Isles and its telegraphic connection to the Britain and, hence, Europe was to play a major role in the reduction of transatlantic communication times. This would be achieved by fast steamships collecting and delivering messages to the west-coast of Ireland from where they could be rapidly transmitted throughout Britain and Europe using the telegraph. This, given the importance attached to information, had the potential to give commercial advantage to those who used these services.

The introduction of steam power to the seas had alerted government and enterprise to the advantages that this technology gave to the rapid transmission of important information. This was in evidence with the establishment of companies such as the City of Dublin Steam Packet Company to service the link between Ireland and Britain.[30] The opening of such a steamship line between Ireland and North America would represent an enormous advantage to the island's mercantile and business communities.[31]

In 1850, prior to the laying of a successful telegraph cable across the Irish Sea, a parliamentary committee was convened to enquire into the establishment of a transatlantic packet station on the west coast of Ireland as the point of departure for

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[29] The Electric and International Telegraph Company, *Scale of charges* (London, 1866), pp 52, 54, in Scale of charges (BT archive, TGE/1/7/2).
[30] John de Courcy Ireland, *Ireland and the Irish in maritime history* (Dublin, 1986), p. 246.
[31] Galway Transatlantic Steam Packet Company, *Nautical and statistical report, with time and traffic tables* (Dublin, 1851), p. 13.

the United Kingdom's North America mail.[32] Such a proposal was feasible in this

period of feverous rail expansion that was destroying the barriers of space and time.

The government hoped to land mail at an Irish west-coast transatlantic packet

station, transport it by train to Dublin and then by steamer to Britain.[33] The

parliamentary committee estimated that mail could be transported from the west-

coast of Ireland to Kingstown, the Dublin packet port, and on to Holyhead in six

hours. Hence, mail landed at Galway could be transported to Liverpool nearly eleven

and a half hours faster than a direct transatlantic steamer.[34]

While the committee had doubts as to the desirability of establishing a packet

station for a reduction in time in the region of twelve hours, it did see the potential of

such a station if used in conjunction with telegraphic communication:

> The use of the electric telegraph has been much relied upon as rendering such
> a change desirable and there is no doubt that by means of this invention
> combined with the establishment of a packet station on the west coast of
> Ireland, the interchange of intelligence with North America might be
> considerably expedited. Under present circumstances, supposing that an Irish
> port were substituted for Holyhead as the packet station, 20 hours would thus
> be gained in the correspondence of places on the east of St. George's
> Channel, and 25 hours by that of Dublin with North America. If a continuous
> line of electro-telegraphic communication existed between Holyhead and the
> Irish port, the saving for the former place would be 25 hours; but the
> establishment of this mode of correspondence between Holyhead and Dublin
> is a task of great difficulty, and one which has yet to be accomplished.[35]

While a transatlantic packet station would bring many advantages to Ireland,

there was much more at stake. Communication times across the Atlantic were of

extreme importance to Britain in its commercial dealings with the emerging

economic powerhouse that was the United States. The America government was also

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[32] *Report of the commissioners appointed to inquire as to the proposal for an Irish packet station*, 251
[C 1391], H.C. 1851, xxv, 9.
[33] W. A. Purdon, *South-western packet station, Ireland, and communication with America* (Dublin,
London, 1850), p. 4.
[34] *Report of the commissioners appointed to inquire as to the proposal for an Irish packet station*, ,
12.
[35] *Report of the commissioners appointed to inquire as to the proposal for an Irish packet station*, ,
16.

willing, for both jingoistic and commercial reasons, to financially support transatlantic mail steamers.[36] In a deputation to the parliamentary committee in December 1850, John Howe, provincial secretary of Nova Scotia,[37] stated that the government in Nova Scotia and New Brunswick feared attempts at a monopoly over its telegraph lines by the United States. Such a monopoly could be used by America speculators to gain commercial intelligence to use against British interests.[38] It was thus essential to the commercial well-being of Britain that a telegraph/steamship communication link be established between North America and Ireland.

In 1859, a year after the failure of the first transatlantic cable (1858) and six years after the laying of the first successful submarine telegraph cable between Ireland and Britain, a further parliamentary committee published its findings. This again highlighted the importance of telegraphic communication to any proposal for an Irish transatlantic packet station. On the far side of the Atlantic a telegraph network running from New York to Newfoundland had been constructed in preparation for the failed 1858 transatlantic cable. It was now possible to use this defunct telegraph line to transmit messages from New York to Newfoundland and, from there, by steamer to a telegraphically equipped Irish packet station in six days. This was under half the time taken for a steamer to travel from New York to Liverpool.[39]

The Royal Atlantic Steam Navigation Company, popularly known as the Galway Line, was formed in 1859. The company sought a government contract to

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[36] John Kennedy, *The history of steam navigation* (Liverpool, 1903), pp 92-6.
[37] J.M. Beck, 'Howe, John', in *Dictionary of Canadian biography* (Toronto, 1972), available at (http://www.biographi.ca) (11 Oct. 2016).
[38] *Report of the commissioners appointed to inquire as to the proposal for an Irish packet station*, 116-7.
[39] *Instructions, June 1852, from Admiralty to Committee to inquire into Suitability of Ports of Galway and Shannon as Transatlantic Packet Station; Report and Minutes of Evidence of Committee,* H.C. 1859 (257), xvii, 7; H. C. Brookfield, 'Ireland and the Atlantic ferry: a study in changing geographical values' in *Irish Geography,* iii, no. 2 (1955), pp 69-78, at p. 71.

transport mail from Galway to 'Portland, Boston, or New York via St. John's, Newfoundland, or otherwise, for the sum of £3,000'.[40] They also offered to transmit "'telegraphic messages from the United Kingdom to the United States in six days'".[41] Although granted such a contract the company was ultimately unsuccessful due to a number of difficulties, including faulty ships and late delivery of mail.[42] The formation of the Galway Line did nonetheless motivate other shipping companies to include Irish ports-of-call on their transatlantic lines in order to pick up passengers and dispatches.[43]

By 1865 the B&I MTC was advertising that messages from across the United Kingdom, to America:

> may be forwarded at through rates to catch the mails calling at Queenstown and Londonderry, and can be telegraphed on to their destination from the first port at which the vessels touch, on the American side. Telegrams are also received from America at Crookhaven [Cork] and Greencastle [Lough Foyle], where the company have arrangements for intercepting the inward mail streamers.[44]

The company also had arrangements to intercept transatlantic 'intelligence' at Cape Clear and in 1864 it renegotiated its agreement with the *Times*, of London, to supply it with 'intelligence' for 10*s.* for twenty words during publication hours, and 7*s.* 6*d.*

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[40] Kennedy, *The history of steam navigation*, p.112.

[41] Quote from unknown source in Kennedy, *The history of steam navigation*, p. 112; *First report from the Select Committee on packet and telegraphic contracts; together with the proceedings of the committee, minutes of evidence, and appendix*, H.C. 1860 (328), xiv, ix (henceforth cited as *First report on packet and telegraph contracts*).

[42] Kennedy, *The history of steam navigation*, pp 112-3; Timothy Collins, 'The Galway Line in context: a contribution to Galway maritime history (part 1)' in *Journal of the Galway Archaeology and Historical Society*, xvii (1994), pp 1-42, at p. 2; *First report on packet and telegraph contracts*, ix-x.

[43] Brookfield, 'Ireland and the Atlantic ferry: a study in changing geographical values', pp 69-78, at p. 71; *First report on packet and telegraph contracts*, xiv; Collins, 'The Galway Line in context: a contribution to Galway maritime history (part 1)', p. 2.

[44] Poster of charges from Alloa telegraph station, July 1865, Poster of charges from Carlisle telegraph station, July 1865, in B&I MTC charges (BT archive, TGF/2/1).
The B&I MTC had sought permission in 1863 from the Office of Committee of Privy Council for Trade, Marine Department, Whitehall, to lay a submarine cable from across Lough Foyle, from Greencastle to Magilligan Point, to connect the Greencastle station to its existing cable running along the railway in Co. Derry: Source: Lough Foyle: British and Irish Magnetic Telegraph company cable (TNA, CRES 58/1066).

during non-publication hours. At Cape Clear, the company used a whale boat to intercept transatlantic steamers as they passed the coast of Ireland.[45]

In February 1865, the B&I MTC received a 'further letter from the Montreal Steam Ship Company [the Allen Line], asking this company to bear a proportion of the expenses of landing dispatches at Greencastle'. The company agreed that they would pay half the expenses up to fifty pound per annum. The approach in itself is demonstration of the usefulness of an Irish telegraph station to the operations of the Allan Line. Indeed this must have been a lucrative service as in June 1867 the Allan line relieved the B&I MTC of any proportion of the expense of landing messages at Greencastle.[46] These west-coast stations allowed transatlantic telegrams to be sent and received throughout Ireland, Britain and Europe, placing Ireland at the cutting edge of transatlantic communication.

Merchants were not the only ones to avail of this rapid means of communication with North America. The government also used telegraphic communication to transmit messages from London to catch the packet at Cork. The circuitous route provided by the B&I MTC though was deemed to cause delays, due to the need to re-transmit the message several times on-route. In 1861 the London and Queenstown Direct Telegraph Company (a subsidiary of the E&I TC) was established to form a direct line of telegraphic communication between London and Cork. It was felt by state officials that 'if this line should be executed it would, I apprehend be employed by the govt. [sic] for transmitting its messages to

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[45] Abstract of minutes of the Dublin Committee of the B&I MTC, 7 July, 7 Apr. 1864, in Abstracts of minutes (BT archive, TGF/1/1).
[46] Abstract of minutes of the Dublin Committee of the B&I MTC, 23 Feb., 13 April 1865, 24 June 1867, in ibid.

Queenstown'.[47] Thus a letter from undersecretary Thomas Larcom at Dublin Castle was sent to the county surveyors of Wexford, Waterford and Cork instructing them to co-operate with the surveying of the new telegraph line.

This line was completed to Cobh and by 1862 had been extended as the London and South of Ireland Direct Telegraph Company as far as Roche's Point to intercept transatlantic steamers.[48] In Ireland the finished line was constructed along the roads, an expensive undertaking. It had two short submarine cables across Cork Harbour and the Blackwater River[49] and was connected to Britain by a submarine cable running from Wexford to Wales (fig. 2.9). The cost of constructing a road-based telegraph and submarine cable to Britain alongside the intervention of the government in advancing the construction demonstrates the importance of Ireland as a port for the transmission of transatlantic telegrams. The central purpose of the line was to gain access to valuable 'American business'.[50] For messages, of twenty words, from Britain to Ireland the E&I TC had a standard charge of 4*s.* The three exceptions: Cape Clear, charge 10*s.*; Greencastle, charge 5*s.*; and Valentia, charge 5*s.*; all were used for transatlantic communication.[51]

While the ability of an Irish-based, telegraphically equipped transatlantic packet station to reduce communication times between Britain and North America

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[47] G. Lewis to Lord Carlisle, [N.D.], in Letters and cuttings, Peel and Larcom, controversy between Peel, O'Donoghue and Fr Lavelle. telegraph line between London and Cobh, 1862 (NLI, Larcom papers, Ms. 7583).

[48] *Irish Times,* 14 Mar. 1862, extract in Letters and cuttings, Peel and Larcom, controversy between Peel, O'Donoghue and Fr Lavelle. telegraph line between London and Cobh, 1862 (NLI, Larcom papers, Ms. 7583).

[49] Sir James Anderson, *Statistics of Telegraphy, Read before the statistical society, June 18th, 1872* (London, 1872), pp 78-91.

[50] 'Extracts from the periodical reports of the Electric and International Telegraph Company' in Appendix E, extracts from the periodical reports of the English telegraph companies and communications from the companies to the Postmaster General, in *Reports to Postmaster General on proposal for transferring to Post Office control and management of electric telegraphs throughout United Kingdom"* appendix, H.C. 1868-68 (202), xli, 80 (henceforth cited as *Reports control and management of electric telegraphs*).

[51] The Electric and International Telegraph Company, *Scale of charges* (London, 1866), pp 26, 52-4, in Scale of charges (BT archive, TGE/1/7/2); *Freeman's Journal*, 23 Jan. 1862.

was not the only rationale behind the implementation of an Irish packet station it did have a significant impact on this development. In this instance, technological development and geographical position were to have a major influence in wiring Ireland into the emerging international telegraphic web. The telegraph made an Irish packet station feasible as it would service not just the island but the whole of the United Kingdom, in turn bringing major commercial benefits to the island.

The next phase in the development of more rapid transatlantic communication times was the laying of a submarine cable to connect Europe to North America. Again commerce and government would be forced to pay for such a service in order to maintain a parity of intelligence with their competitors. Ireland's geographical position meant that it would remain at the forefront of transatlantic communications. This was due to the physical properties of submarine telegraph cables: 'retardation' or signal distortion increases in proportion to its length.[52] This meant that the longer a cable was, the thicker and more expensive it would need to be. The route between Ireland and Newfoundland, being the shortest, was the cheapest. Added to this, both countries had the advantage of being part of the British Empire and hence reduced fears of outside intrusion, a major imperial concern.[53]

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[52] B. J. Hunt, 'Electrical theory and practice in the nineteenth century' in M. J. Nye (ed.), *Cambridge history of science* (Cambridge, 2003), pp 311-30, at p. 315.
[53] *Third report from the Select Committee on Packet and Telegraphic Contracts; together with the proceedings of the committee, minutes of evidence, and appendix*, H.C. 1860 (431, 431-I), xiv, v (henceforth cited as *Third report on packet and telegraphic contracts*).
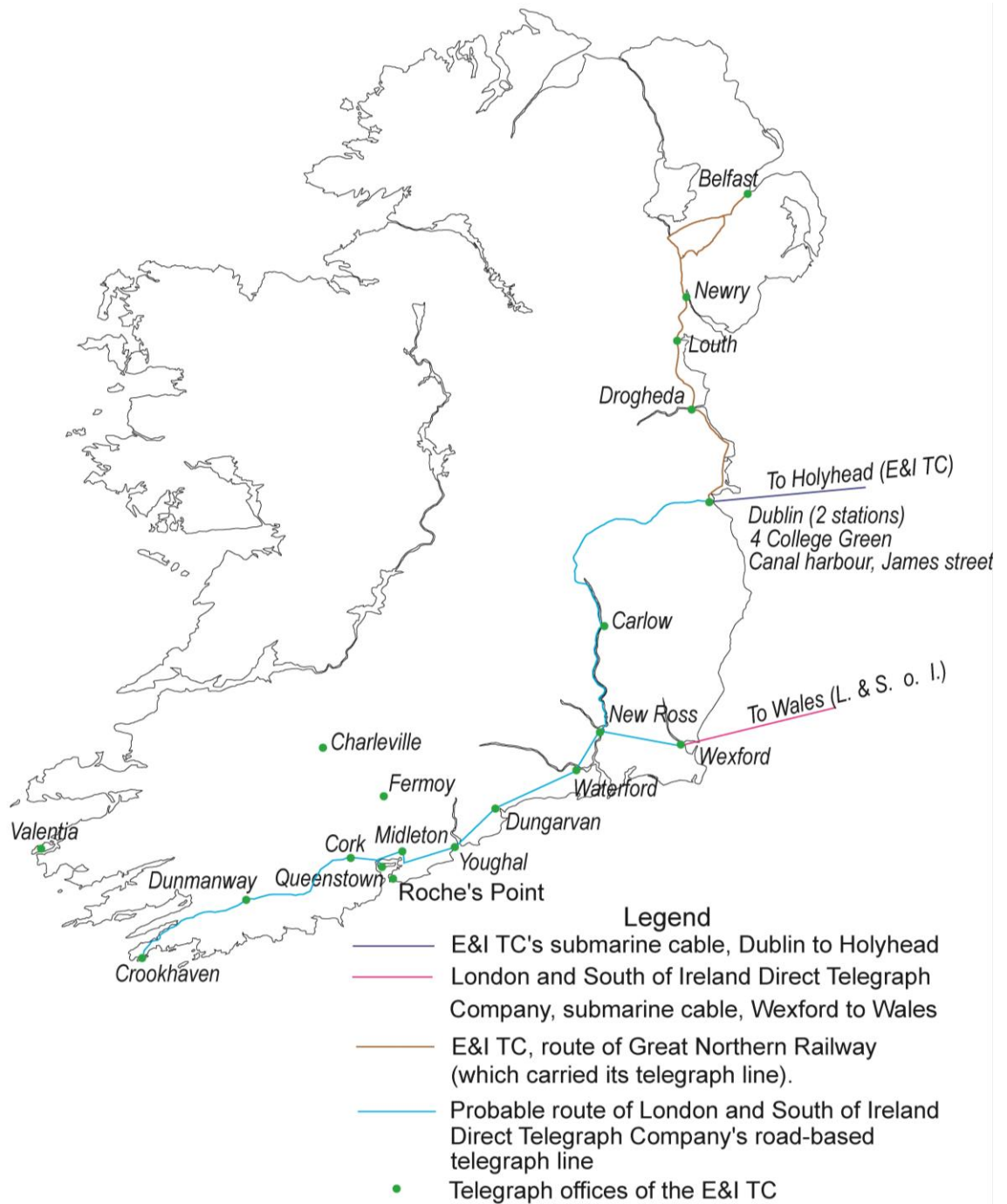
Fig. 2.9 Map of the International and Electrical Telegraph Company's telegraph offices and lines in Ireland, *c.* 1865 (N.B. some of the lines on this map are approximations)
Drawn by A.J. Kirwan from The Electric and International Telegraph Company, Scale of charges (London, 1866), pp 26, 52-4, in Scale of charges (BT archive, TGE/1/7/2); *Freeman's Journal*, 23 Jan. 1862.

The advantages of such a connection were obvious to many of the staff and shareholders of the E&I MTC. These were well represented in the investors of The Atlantic Telegraph Company when it was formed in 1856 by among others Charles T. Bright, the E&I MTC's chief engineer.[54] In 1858, following failure the previous year, a cable was successfully laid across the Atlantic. This success was short-lived: the cable took sixteen hours to transmit the inaugural message of the America President and failed after a few weeks during which it operated poorly.[55]

The British and American governments had both guarantee the Atlantic Telegraph Company £14,000 per annum, reducing to £10,000 when the dividend was more than six percent, for as long as the cable operated. Upon its failure the British government entered into a fresh agreement with its successor company, the Anglo-America Telegraph Company, guaranteeing of eight percent per annum on a capital of £600,000 for twenty years.[56] The Admiralty was also to grant the company the use of ships and crews necessary for surveying the proposed route of the cable.[57] In addition to this most of the private funding for the new enterprise was raised in the United Kingdom.[58] This signals a perception that control of such a cable was paramount to maintaining Britain's dominant position in global affairs. The failure of the cable also led to the establishment of a 'joint committee on submarine telegraph cables', which included members of the Board of Trade and the Atlantic Telegraph Company. This sought the advice of experts in the field of electricity including the future Lord Kelvin, William Thomson.

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[54] Bright, *The life story of Sir Charles Tilston Bright*, pp 39-45.
[55] Daniel R. Headrick and Pascal Griset, 'Submarine telegraph cables: business and politics, 1838-1939' in *The Business History Review*, lxxv, no. 3 (2001), pp 543-78, at pp 548-9.
[56] *Third report on packet and telegraphic contracts*, iii-iv.
[57] *John Bull* (London), Issue 2,164, 31 May 1862 [p. 346]
[58] Kieve, *The electric telegraph,* p. 113.

The outbreak of the American Civil War in 1861 and subsequent Anglo-American tensions delayed a second transatlantic cable attempt. However, once the American Civil War was drawing to a close funding was found for a new attempt at laying a cable between Valentia Island, off the west coast of Ireland, and Heart's Content, Newfoundland. A cable, alongside one lost the previous year (1865), was successfully laid in 1866; the total cost for both expeditions being approximately seven-million-pounds sterling.[59] Ireland's monopoly of transatlantic telegraphic communication was not to last, the French *Société du Cable Transatlantique Francais*, established in 1869, being the first of many rivals. However, the Anglo-America Telegraph Company was slow to lose its dominance of the route and with the shortness of the Ireland to Newfoundland cable it remained the fastest for transmissions.

Ireland's geographical position as the most westerly part of the British Isles, alongside its connection to the British and European telegraph networks played a significant role in the introduction of transatlantic steam shipping to Irish ports. This in turn increased the island's connectivity to an emerging global communication network. In the case of the transatlantic telegraph cable these two factors again played a prominent role in the promotion of an Irish transatlantic telegraph station.

Conclusion

By 1868 the telegraph was well established in Ireland and, most importantly, provided connectivity between the island and Britain. Indeed, it was this connection that spurred the massive growth of telegraphy in Ireland. While the development of the island's telegraph network in this period was rapid, it was still restricted,

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[59] Headrick and Griset, 'Submarine telegraph cables: business and politics, 1838-1939', pp 549-50.

primarily, to the railway network. Only a few offices were built beyond the reach of the railway line primarily to service, the highly profitable, transatlantic steam packets. Roger Barton has argued that the central factors driving the development of the telegraph in Ireland in this period was its potential use in reducing transatlantic communication times and in connecting linen producers in Britain and Ireland.[60] However, this thesis would argue that the rationale behind the construction of an Irish telegraph network was much more nuanced. The telegraph network as it developed was much more concerned with the connection of Irish towns to each other and Britain. This would allow them access to financial information from the rest of the country and Britain and in turn would maximise the profit potential of the network for the telegraph companies

While the use of the telegraph to improve communication times between North America and Britain had been noted prior to the connection of the two islands, it was the laying of the cables between Ireland and Britain that provided the impetus for the introduction of steam packets to the west coast of the island. This in turn further stimulated interest in this aspect of Irish telegraphy; this was particularly evident in the expensive construction undertaken by the E&I TC in the south of the island. However, the nature of the B&I MTC's network, expanding as it did to cover the whole of Ireland's rail infrastructure highlights that telegraphic development was initially more focused on the profits to be gained from Irish towns.

The very lack of substantial telegraph development in Ireland in the period prior to the laying of a submarine cable connecting it to Britain highlights how central this connection was in the growth of Irish telegraphy. Thus, while the use of the telegraph for transatlantic connectivity was to become an important factor, it was

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[60] R.N. Barton, 'Construction of the network society: evolution of the electric telegraph 1837-1869' (Ph.D. thesis, Department of Science and Technology Studies, UCL, 2007), p. 243.

just one of many driving the development of the telegraph network in Ireland in the period covered by this chapter.

For many the progress made in the development of telegraphy in Ireland and across the British Isles and the service that was being offered by the private operators while impressive was still not sufficient for a great industrial power such as the United Kingdom. Many individuals and businesses, such as merchants and the news industry, felt that this important service should become a public utility, under the remit of the state. This was to be the next stage in the development of telegraphy, as state influence moved from regulation to nationalisation.

<div align="center">**Chapter III**</div>

<div align="center">**The nationalisation of the British Isles inland telegraphs, *c*. 1868-1870**</div>

Introduction

By the late 1860s private industry had transformed telegraphy from an untested,
experimental technology into a utility that was essential for the operation of a fast-
changing, industrialised society. Nevertheless, leading up to 1868 there were
growing calls for public ownership of the British Isles' inland telegraphs. This
chapter shall enquire into the perceived difficulties with privately-operated telegraph
networks and the role of the state in a *laissez-faire* economy. Following
nationalisation in 1870, inland telegraphy would undergo major changes as the state
sought to meet increasing demand and to fulfil the promises held out by the
nationalisation debate. Thus, the chapter will seek to understand how social
pressures that had been generated by the nationalisation debate were to reshape the
United Kingdom's inland telegraph network in this period.

The only regulatory guidance that the early telegraph companies experienced
was set out in their charters of incorporation. These placed few restrictions on how
the companies constructed and operated their networks. What they did set out—in
detail—was their financial arrangements and the powers that the state had over them.
This normally extended to a requirement to erect telegraphs for the government if
requested, to give priority to government telegrams, and allowed government to
assume control of telegraph networks in times of emergency.[1]

The first general act to regulate the telegraph sector—passed in
1863—introduced restrictions on the laying of lines and a requirement to notify local

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[1] For example see, Deed of settlement of the English and Irish magnetic telegraph company, 16 Aug.
1852 (BT archive, TCN/1/1/2).

authorities prior to commencing work. The bill sought to protect the rights of householders whose property might be impinged by such work. It also reaffirmed the right of principal secretaries of state to assume control of the telegraph when it was deemed necessary. [2] This power was extended to the lord lieutenant of Ireland under the Telegraph Amendment Bill, 1866.[3]

This minimal regulation was in accordance with the prevailing free-market ideology of the nineteenth-century British state in its dealings with the private sector: the state should not interfere or compete with the operations of private enterprise. Such a policy had served the telegraph industry well and by the 1860s multiple telegraph networks encompassed much of the United Kingdom and it was well connected to Europe and America. By 1866 the two main companies, the Electric and International Telegraph Company (E&I TC), and the British and Irish Magnetic Telegraph Company (B&I MTC), had in total over 14,000 miles of line, 1,745 stations and transmitted over 4.5 million messages.[4] Ireland, an economic backwater compared to industrialised Britain, was well served by these two companies. By the 1860s around 160 telegraph stations were distributed across the island and it was connected by submarine cables to Britain and North America (ch. 2).

In 1851 a challenger to the near cartel exercised by the B&I MTC and E&I TC was registered. This was the United Kingdom Telegraph Company (UKTC) which became operational in 1860 and proposed a revolutionary uniform rate of 1*s.* for a twenty-word message irrespective of distance. This led to opposition from the

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[2] Telegraph Act 1863, 26 Vic. C. 112 (28 July 1863).
[3] Telegraph Amendment Act 1866, 29 & 30 Vic. AP. III (6 March 1866).
[4] *Reports to Postmaster General on proposal for transferring to Post Office control and management of electric telegraphs throughout United Kingdom,* H.C. 1867-68 (202), xli, 158 (henceforth cited as *Reports control and management of electric telegraphs*).

existing telegraph companies who attempted to legally thwart the UKTC by, unsuccessfully, challenging its right to lay lines along highroads.[5]

While the UKTC's reduced rate of transmission was not popular with its rivals, it was warmly received by mercantile interests. As the cost of transmitting telegrams had, up to this point, been based on distance, a 1*s.* transmission rate would be a boon for Britain's peripheral regions. Due to the UKTC's limited network the E&I TC and B&I MTC were able to introduce a 1*s.* rate to any town served by the UKTC, while maintaining their rates to other locations. This in essence stunted the growth of the UKTC by undermining its attractiveness to investors.[6]

The rapid expansion of the private telegraph companies' networks throughout the British Isles during the early and mid-nineteenth century, while impressive, was not without problems. There was a substantial number of telegraph offices, but geographical distribution was biased toward areas that were deemed profitable and that were serviced by railway lines. Therefore, many areas that would benefit from the advantages brought by telegraphy were deprived of this service. In addition, excluding major urban centres, most towns had only one telegraph office that was positioned for proximity to the railway line and not for maximum benefit to users. This meant that much of the town was outside the, one-and-a-half mile, free delivery radius.

In 1865 the three companies—the B&I MTC, E&I TC and UKTC—entered into an agreement to fix charges. The new uniform rates for the transmission of twenty words ranged from 1*s.*, up to 100 miles, to 2*s.*, up to 300 miles. While this episode would seem to be a victory for the existing in-land telegraph companies it

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[5] Jeffrey Kieve, *The electric telegraph: a social and economic history* (Newton Abbot, 1973), pp 59-63.
[6] *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, H.C. 1867-68 (435) (465-I), xi, 108-9.

did have long-term impacts on public perception of the industry. The idea of a 1*s.* rate and its subsequent failure created a crisis of expectation in mercantile circles. Chambers of commerce throughout the British Isles soon followed the lead of Edinburgh's in calling for the transfer of the telegraphs to state ownership.[7]

The rationale behind the calls from trade, mercantile and industrial figures was that competition, the need to pay dividends and the restrictions upon expenditure had inhibited the growth of telegraphy and restricted its usefulness as a tool of enterprise. The chambers of commerce complained 'that the existing charges for the transmission of messages are too high; that many places and districts are unprovided with facilities for telegraphic communication; that, in the great majority of places which are provided with facilities for telegraphic communication, the telegraph office is inconveniently remote from the centre of business and population, and open for too small a portion of the day.' It was argued that only through government ownership could the perceived problems be remedied, and the telegraph become a properly operated public utility.[8]

The three telegraph companies also entered into agreement in 1865 to combine their news and intelligence departments. These supplied 'intelligence' by telegraph to newspapers throughout the United Kingdom. Thus, this agreement monopolised the supply of telegraphic intelligence. Provincial newspapers, in order to compete with London papers, were reliant upon these intelligence reports. According to F. D. Finlay, proprietor of Belfast's *Northern Whig,* telegraphic reports of speeches of parliament were the most highly read of all this intelligence.[9] While transmission of this information was charged at a rate considerably lower than that charged to the public, provincial newspapers complained of poor, biased,

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[7] Ibid, 32, 75, 95.
[8] Ibid, 2.
[9] Ibid, 102, 104.

inconsistent intelligence, with some openly calling for nationalisation.[10] The shoddy

service provided by the telegraph companies' intelligence department manifested

itself in numerous ways, including the late relaying of information such as stock

market prices and important parliamentary debates. This poor service came as a

surprise to the news industry in light of the 'very large price obtained by the

Telegraph Company from newspapers for the transmission of their summaries'.[11] To

supplement the poor service offered by the telegraph companies some newspapers

had resorted to hiring private wires for the transmission of their own intelligence.[12]

The quality of intelligence being supplied was so deplorable that some

newspapers had given up on it completely and cancelled their subscriptions.

Operating under such conditions it was little wonder that provincial newspapers

would be at the forefront of the campaign for telegraph nationalisation. Numerous

Irish newspapers, such as the *Belfast Northern Whig*, *Cork Examiner*, *Cork Daily

Herald*, *Freeman's Journal*, *Dublin Daily Mail*, (Dublin) *Sanders Newsletter* and

Dublin Evening Mail, were active in this campaign.[13]

The very fact that many in the United Kingdom desired nationalisation

demonstrates how deeply the telegraph had inserted itself into the fabric of the

nation's industrial, economic, mercantile, and social life. While the period leading up

to nationalisation saw increasing calls for public ownership of the United Kingdom's

telegraph networks, paradoxically, beside the news industry, there was little criticism

of the private operators. Rather, the nationalisation debate was couched in terms of a

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[10] *Belfast Newsletter,* 22 Feb. 1868; *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, 12.
[11] *Irish Times and Daily Advertiser,* 3 July, 20 Mar. 1867; *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, 102.
[12] *Freeman's Journal,* 4 June 1868.
[13] *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, 94, 99-100.

successful era of private ownership, with public ownership now being necessary to enhance what had become an important public utility.

This perception of successful private ownership was demonstrated in 1870 when a committee was established for the 'purpose of presenting a testimonial' to T. H. Sanger, who had been the manager of the B&I MTC's Irish operations for the previous fifteen years. The exalted membership of this committee permits an insight into the pervasive role that the telegraph had come to play in the Irish economy: Sir Arthur Guinness, brewing industry; Sir John Grey, *Freeman's Journal*; Valentine O'B. O'Connor, railways; J. W. Switzer, department store; H. Mannsell, medical doctor; Frederick Stokes; J. P.[14] In the case of the Guinness brewery as an agri-industrial exporter—which by 1870 accounted for seventy percent of all Irish beer exports—,[15] the telegraph was so important that the E&I TC had a minor office at James's Gate, Dublin (the entrance to the Guinness brewery).[16] The committee's formation demonstrates that despite criticism there were significant figures that considered private proprietorship of the telegraphs to have been successful and reveals the importance of telegraphy to the city's and nation's economy.

As C.R. Perry has demonstrated, in the first half of the nineteenth century there was an awakening within the Post Office to the advantages that could be brought by branching out into areas of the private economy. While the Post Office would still be required to generate enough income to meet its operational costs, its function had changed from being a revenue-generating department to the provider of a public service. It was now geared toward aiding the economic development and modernisation of the state. This new role was aptly demonstrated in 1840 with the

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[14] *Irish Times and Daily Advertiser,* 24 Jan. 1870.
[15] Cormac Ó Gráda, *Ireland: a new economic history, 1780-1939* (Oxford, 1995), p. 304.
[16] *Irish Times and Daily Advertiser,* 28 Sept. 1868.

introduction of the 'penny post'. Although this led to a significant reduction in revenue, it produced a massive increase in the volume of mail, which was deemed to bring social and economic benefits. [17]

In the 1860s this new-found interest in expanding the services of the Post Office was exhibited with the founding of a Post Office savings bank. Its establishment—to service the needs of the working class—was carried by an appeal to the Victorian values of self-help and thrift. While restrictions on the size of deposits meant that the new savings institution would not be attractive to the middle or upper-classes, thus removing fears of competition with existing, private sector financial institutions.[18]

Much of the discourse in relation to the nationalisation of the telegraph network has revolved around the issue of state intervention in a *lassize-faire* economy.[19] While industry and trade had been strong advocates of free-market economics, the reality of economic planning was not as strictly doctrinal as it might appear. Throughout the nineteenth century, the state had played a growing role in regulating the economy and industry. [20] This was seen in the abolition of the slave trade, the protection of factory workers and Post Office expansion.[21] State subsidies to transport companies and to submarine telegraph companies (ch. II) also demonstrate that it was often quick to give a helping hand to the 'invisible hand'. Thus, public ownership of important utilities was not as anathema to nineteenth-

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[17] See C. R. Perry, *The Victorian Post Office: the growth of a bureaucracy* (London, 1992); *Reports control and management of electric telegraphs*, 46-7.
[18] Perry, *The Victorian Post Office*, pp 53, 63-65.
[19] For example see Perry, *The Victorian Post Office*; Kieve, *The electric telegraph*.
[20] Mark Hennessy, 'Administration' in H.B. Clark and Sarah Gearty (eds), *Maps and texts: exploring the Irish Historic Towns Atlas* (Dublin, 2013), pp 152-64, at p. 154.
[21] J. Bartlet Brebner, '*Laissez Faire* and state intervention in nineteenth-century Britain' in *The Journal of Economic History*, Supplement: the tasks of economic history, viii (1948), pp 59-73, at p. 71.

century thinking as we might think, for example Manchester had a publicly owned gas utility since the 1820s.[22]

Industrialisation and the increased need for the regulation of society also had an impact on perceptions regarding state intervention. Networked systems, such as railways and telegraph systems, even without state ownership, required regulation in order to operate efficiently. In such industries the state played a vital role in promoting the public good, as seen by the eventual regulation of railway gauge in 1892.[23]

The notion of a *lassize-faire* British nineteenth-century is helpful in understanding the ideological processes at work in forming public opinion and state action. However, like any ideology, it can be seen as dominant in this period without being dogmatic. Indeed many *lassize-faire* economists promoted the idea of government interference where individual interest could not provide public services. For example, Adam Smith was a strong believer in the need for the state to provide defence against foreign invasion.[24]

A gradual shift in the interventionist leanings of economists was evident throughout the nineteenth century but this was not due to an abhorrence of free-market principles. Rather, it is possible to view the politics of nineteenth-century Britain as having a *lassize-faire* ideological basis without negating the role of state inference for the regulation of the economy. Under these conditions nationalisation of the inland telegraphs should not be seen as a dramatic change to the operation of the free-market but rather another phase in the evolution of political economy. In this

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[22] Duncan Campbell-Smith, *Master of the Post: the authorised history of the Royal Mail* (London, 2011), p. 177.
[23] Peter Mathias, *The first industrial nation: an economic history of Britain, 1700-1914* (London, 1969), p. 285.
[24] A.J. Taylor, *Laissez-faire and state invention in nineteenth-century Britain* (London, 1972), pp 19-22.

instance the perception that public control of the telegraphs would produce a greater service to the bulk of society meant that nationalisation was a natural outcome of Utilitarian thought. In addition, the fact that such theories were interpreted by politicians who had concerns beyond the purely economic meant that *lassize-faire* ideology, no matter how attractive, would never completely destroy the urge or perceived need for government intervention in the private economy.[25]

In light of the ongoing reinterpretations of state economic intervention throughout the nineteenth century, it is more appropriate to view the nationalisation of inland telegraphs not as an aberration of *lassize-faire* norms but rather a point in time where the ongoing struggle between these two ideological positions tilted in favour of intervention.

In 1861 John Lewis Ricardo—who as MP for Stoke-upon-Trent advocated the repeal of the corn laws and the navigation laws—,[26] a former chairman E&I TC, published his *Memorandum in support of the expediency of the Telegraphic communication of the Kingdom being placed in the hands of Her Majesty's Government*. In this Ricardo expressed his desire that the government assume control of the inland telegraphs. In his call for nationalisation Ricardo was following in the footsteps of Thomas Allan, founder of the UKTC. In 1856 F. E. (Fredrick Ebenezer) Baines, a Post Office clerk who had started his career working in the Electric Telegraph Company's office based at St Martin's-le-Grand (the General Post Office, London), had submitted a plan for a postal telegraph system. This proposed the purchase of the telegraph companies and the introduction of a reduced uniform rate for transmission. The Post Office was deemed to be the natural body to control a

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[25] Ibid, pp 21-6.
[26] W.A.S. Hewins, 'Ricardo, John Lewis (1812–1862)', in H. C. G. Matthew, *Oxford dictionary of national biography* (Oxford, 2004), available at (http://www.oxforddnb.com) (11 Oct. 2016).

nationalised telegraph service, as its infrastructural possessions and workforce would allow it to minimise costs. [27]

A prominent figure pushing for telegraph nationalisation was F.I. (Frank Ives) Scudamore—an assistant secretary at the Post Office. In 1865 he was directed by the postmaster general, Henry Stanley third Baron Stanley of Alderley, to enquire into the impact and cost of a Post Office takeover of the inland telegraphs. Scudamore's report reiterated much that had already been said about the telegraphs: that many areas were ill-served; that removing duplicate lines and offices would lead to a more cost effective service; that the use of the Post Office's existing infrastructure would greatly increase the public's access to telegraphic communication; and that the Post Office, without bondholders to satisfy, would be able to significantly reduce the cost of telegrams while improving the service to the public.[28]

There was growing realisation of the importance of the telegraph to the economic well-being of the country and its usefulness as an administrative tool of the state.[29] It was obvious to the government that 'communication by electric telegraph within the United Kingdom' was 'insufficient, and many important districts' had no telegraphic provision at all.[30] A proposed 1*s.* rate for transmission regardless of distance would increase the use of the telegraph and 'stimulate trade, economise capital, and facilitate every operation of commerce.'[31]

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[27] *Reports control and management of electric telegraphs,* 7-8, 42-7; S.E. Fryer, 'Baines, Frederick Ebenezer (1832-1911), in rev. Anita McConnell, *Oxford dictionary of national biography* (Oxford, 2004), available at (http://www.oxforddnb.com/view/article/30538) (11 Oct. 2016).
[28] Kieve, *The electric telegraph,* pp 128-36.
[29] *Freeman's Journal,* 21 May 1868.
[30] The Telegraph Act, 1868, 31 and 32 Vic. C. 110 31 (31 July 1868).
[31] *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, 7-8, 102, 105.

A significant majority of the existing telegraph offices were located outside of the towns that they serviced. At these locations the Post Office proposed to extend the telegraph line to the town centre. In addition, it would provide a telegraph office at every money-order office; this would dramatically increase access to telegraphy. For example, in Ireland there were 509 towns and villages with such offices. Of these 109 were deemed by F. I. Scudamore to have 'perfect accommodation' while a further ninety-two would require the extension—averaging three-quarters of a mile—of the existing telegraph line. Hence, he envisaged at least another 367 Irish telegraph offices. Therefore, while the bulk of the telegraph's infrastructure would remain railway based, extensive additional lines would be constructed along the roadside in order to connect urban centres. Scudamore also proposed to lengthen telegraph office opening hours to provide greater service to the public.[32]

By 1868, despite the resistance of the telegraph companies,[33] the government was ready to authorise public ownership of the in-land telegraphs. The Electric Telegraph Bill was brought to the house giving the postmaster-general the right to purchase in-land telegraph companies—while allowing continued private ownership of international telegraph cables. Purchase was not compulsory; the private telegraph companies had the choice to either submit to government purchase or continue in competition with the Post Office.

The established companies were to receive twenty years' profits, while the newer companies, which had not yet produced regular profits, were to be valued based on their stock prices. These prices were well in excess of the estimated values of the companies in terms of plant. The valuations were deemed valid in recognition

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[32] Ibid, 5-9; Thomas Wall, 'Some notes towards a history of telecommunications with particular reference to Ireland' Unpublished paper, 2005 (NLI, call no. 5B 180), p. 36.
[33] For example see the E&I TC's *Government and the telegraphs; statement of the case of the Electric and International Telegraph Company against the government bill for acquiring the telegraphs* (London, 1868).

of the 'goodwill' that the Post Office was buying. The private telegraph companies

argued that their businesses consisted of more than just plant and that the good

relations that they had built with customers was a significant part of their true value.

In order to placate the companies the government was to agree to include 'goodwill'

in their valuation. This 'goodwill' payment can be construed as the cost of

government interference in the private economy.[34] The act also provided

compensation to railway and canal companies for loss of earnings from the

transmission of messages and provided them with telegraphic facilities for use in

regulating their lines. In addition, the Post Office would transmit for free all

messages from the railway companies to points beyond their own networks.[35]

The 1868 act introduced a uniform 1*s.* rate for the transmission of a twenty-

word message over any distance.[36] It was felt that this would not hamper the Post

Office in recouping the cost of purchasing and operating the telegraph networks.

Instead, as with the introduction of the 'penny post', a 1*s.* telegram rate would

significantly increase the number of telegrams transmitted and thereby maintain

profits. The bill, and the reduced rate, was heavily endorsed by numerous chambers

of commerce.[37]

Following the passing of the 1868 Electric Telegraph Bill many in

government felt that the lack of a monopoly would hinder the financial well-being of

a nationalised telegraph system. Private companies could operate in high-usage areas

and charge less than the Post Office. In London, for example, the rate of

transmission within the metropolitan area was half that proposed by government.

This could lead to difficulties in recouping the capital expended on purchasing and

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[34] *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, 152, 157.
[35] Telegraph Act 1868, 31 and 32 Vic. C. 110 31 (31 July 1868).
[36] Ibid.
[37] *Freeman's Journal,* 21 May 1868.

upgrading the telegraphs. Due these worries, it was decided to pass a second bill authorising compulsory purchase of all inland telegraph companies.[38]

The Telegraph Act, 1869, was passed 'in order to protect the public revenue' and invested in the postmaster general a monopoly over the transmission of inland telegrams; this did not affect telegraph lines used purely for private purposes or overseas telegraph cables. The bill allocated over £5,700,000 for the purchase of the telegraph companies. In addition, a sum not in excess of £700,000 was allocated for dealing with the rights of the railways and a further sum not in excess of £300,000 was allocated for other costs.[39] These sums were significantly higher than the original figure, of £2,400,000 sterling, mooted for the limited purchases envisaged at the start of the nationalisation debate.[40]

Rationalisation of the existing telegraph networks was a pressing concern in order to remove duplicate lines and offices, and thus reduce costs. In addition, telegraph wires would be run to post offices and the telegraph network expanded. New telegraph offices would be opened each month and a large number of telegraph offices belonging to railways had agreed to transmit messages on behalf of the Post Office.[41] Critically, aware of the expectations that the nationalisation debate had produced, the Post Office was unwilling to assume control of the inland telegraph network until the rationalisation and upgrading of its infrastructure was completed. This would allow the postal telegraph system to meet the demands of its customers and single it out from its predecessors.[42]

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[38] Anon, *The Post Office, an historical summary* (London, 1911), p. 68; For a full account of this episode please consult C. R. Perry, *The Victorian Post Office.*
[39] Telegraph Act 1869, 32 & 33 Vic. C. 73 (9 August 1869); Anon, *The Post Office,* p. 68.
[40] *Reports control and management of electric telegraphs*, 37.
[41] *Freeman's Journal,* 2 Feb. 1870; *Report on reorganisation of telegraph system of United Kingdom*, 703 [C 304], H.C. 1871, xxxvii, 44.
[42] Letter from Post Office to to H. Weaver Esq., E&I TC, 30th August 1869, Letter from H. Weaver to F.I. Scudamore, 1 Sept. 1869, in Extensions to the telegraph system on the acquisition by the Post Office of telegraph Companies (BT archive, POST 30/193D).

A number of difficulties faced the Post Office upon the passing of the Telegraph Acts, 1869-70. Firstly, it had none of the experience or expertise required to operate a telegraph network. It would rely heavily upon the clerk F.E. Baines—one of its few employees with telegraph experience. It would also seek to recruit much of the management and staff of the private telegraph companies; for example, R. S. Culley, the E&I TC's chief engineer assumed the same role in the postal telegraph service.[43]

The Post Office planned to carry out significant infrastructural work prior to nationalisation by utilising the private companies. This plan was thwarted, to a degree, for two reasons: firstly, the delay between the passing of the first and second telegraph act, in 1869, meant that the Post Office was not in a position to engage the private companies until late that year.[44] Secondly, upon nationalisation in 1870, many telegraph operators and linesmen, working railway telegraphs, were required to remain at their posts in order to ensure safety, meaning that the Post Office could not make use of this trained workforce.[45]

The Post Office had inherited four large and distinct telegraph networks, as well as a number of minor telegraph systems.[46] The minor networks mostly consisted of single lines, either laid for use by a railway companies or private individuals. Significantly, there was no connectivity between the main telegraph networks (ch. II). The Post Office would carry out significant structural work to these networks, removing duplications and providing interconnectivity, in order to build a unified telegraph network.

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[43] Letter Treasury to F.I. Scudamore, 16 Sept. 1869, Letter R.S. Culley to F.I. Scudamore, 24 Sept. 1869, in Ibid.
[44] Kieve, *The electric telegraph,* pp 176-8.
[45] *Report on reorganisation of telegraph system of United Kingdom*, 54.
[46] The four main networks were those of the Electric and International Telegraph Company, the British and Irish Magnetic Telegraph Company, the United Kingdom Telegraph Company and the London District Telegraph Company.

In addition to the tasks of structural rationalisation and recruitment of staff, pressure was also brought to bear on the Post Office to fulfil the expectations of the public that had been raised during the nationalisation debate. This included: increased geographical distribution of telegraphic service, the transfer of telegraph offices from outlying railway stations to urban centres, increased efficiency and an improvement in the service offered to the news industry. Alongside this, the Post Office was soon to discover that the private companies had been reluctant to extend their networks in the period leading up to nationalisation. Given the Post Office's promise of increased public access this meant that there was an even greater demand for telegraph lines to be expanded to areas that had been neglected due to the nationalisation debate.[47]

The central task facing the Post Office, in constructing a nation-wide unified telegraph network, was the need to incorporate multiple levels of telegraph offices handling varying volumes of traffic. The private telegraph companies had laid long lines with limited numbers of offices on each, as such offices had to be profitable. The new postal telegraph service planned to open numerous offices in comparison to what existed under the private companies. It would be impossible to operate such a network using the existing linear model of telegraphic infrastructure, as a single telegraph line would have to carry messages from multiple offices which would cause delays. All the offices on a circuit would also have to operate similar telegraph apparatus that could communicate with each. This would mean that all the offices would have to operate either expensive high-speed apparatus or all use slow instruments. In addition, telegraphs located in small postal sub-offices would be operated by postmasters instead of experienced clerks. These postal workers would

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[47] *Report on reorganisation of telegraph system of United Kingdom*, 16-7.

be unable to operate the more complex high-speed telegraph apparatus with any degree of dexterity and would cause delays if connected to direct telegraph lines (these were lines connecting major urban centres).[48]

In order to incorporate the large increase in telegraph offices the postal telegraph service would need to implement a nodal system of telegraphic infrastructure. In the new postal telegraph network, as envisaged by F. E. Baines,[49] the 'head office at postal towns' would be put in contact with each other using telegraph trunk-lines. To handle the volume of telegrams between these offices a Morse printer would be used and the busiest offices would require a Wheatstone Automatic (both high-speed apparatus). These trunk lines would be used purely for communication between 'great towns and centres of business, without any intermediate stations'.[50] The primary concern of the new system would be to ensure rapid communications between these head post offices.[51] It was R.S. Culley's opinion that 'the principle of <u>direct</u> [sic] transmission is a true one and should be acted on in every case in which it will not interfere with rapidity of transmission.' Accordingly, these first-class circuits would ensure that communication between 'large centres of business'[52] was as rapid and accurate as possible.

At a secondary level wires would be 'kept as clear as possible from local work' to allow smaller postal towns to have direct communication with each other and with larger urban centres. Finally, at the tertiary level sub-post offices would be connected to each other and to the central postal telegraph-exchange on their own

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[48] F.E. Baines, Post Office Telegraph (works), principles of redistribution (22 Feb. 1869), in Adaption of the wires of telegraph companies to the Post Office system, p. 85 (BT archive, POST 30/191c); Extensions to the telegraph system on the acquisition of the Post Office of telegraph Companies (BT archive, POST 30/193D).
[49] Report of Mr Culley, 15 Mar. 1869, p. 1, in Adaption of the wires of telegraph companies to the Post Office system (BT archive, POST 30/191c), p. 47.
[50] *Report on reorganisation of telegraph system of United Kingdom*, 44.
[51] F.E. Baines, Post Office Telegraph (works), principles of redistribution (22 Feb. 1869), in Adaption of the wires of telegraph companies to the Post Office system, p. 64 (BT archive, POST 30/191c).
[52] Report of Mr Culley, in Ibid, p. 1.

circuits, thus allowing for telegrams to be sent outside the district. As these offices would have a relatively insignificant volume of telegraphic traffic the Post Office could place a large number of these offices on a single line without reducing the speed of communication on the overall telegraphic system.[53]

Using a switching station a clerk would be able to control the connection of these sub-offices to direct lines, thus allowing them temporary direct communication with large towns outside their own districts.[54] In 1869, prior to nationalisation, such a system was already in place in Manchester and York, allowing surrounding towns to communicate directly with London. At Manchester this service would be provided to the surrounding towns during off-peak hours when there was spare capacity on direct lines. This direct connection would be the exception rather than the rule, as it could lead to delays between head offices, and would only be in operation when direct lines were not busy fulfilling their central purpose of providing communication between head offices. This nodal system would be in operation across the British Isles, including Ireland.[55]

A significant part of the upgrading work was the separation of telegraph lines that had hitherto been used for transmitting both commercial and railway messages. These lines were normally operated by clerks in the employment of the railways and the messages were often concerned with the safe operation of the railway and, as such, were given priority over commercial telegrams. The Telegraph Act, 1869 enforced a strict separation of commercial and railway telegraph lines.[56] This would

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[53] *Report on reorganisation of telegraph system of United Kingdom*, 44-5; F.E. Baines, Post Office Telegraph (works), principles of redistribution (22 Feb. 1869), in Adaption of the wires of telegraph companies to the Post Office system, p. 85 (BT archive, POST 30/191c).

[54] Report of Mr Culley, 15 Mar. 1869, p. 2, in Adaption of the wires of telegraph companies to the Post Office system, p. 48 (BT archive, POST 30/191c); F.E. Baines, Post Office Telegraph (works), principles of redistribution (22 Feb. 1869), in ibid, p. 86.

[55] Report of Mr Culley, 15 Mar. 1869, p. 4, in Adaption of the wires of telegraph companies to the Post Office system, p. 50 (BT archive, POST 30/191c).

[56] Telegraph Act 1869, 32 & 33 Vic. C. 73 (9 August 1869).

enable the rapid transmission of commercial messages which had, on those telegraph lines devoted to dual use, been open to unknown and unquantifiable delays. These upgrades would require the laying of 5-6,000 miles of new wire across the British Isles and the provision of new instruments to replace those that would now be devoted exclusively to railway use. In Britain these upgrades were completed—mainly by the private telegraph companies—prior to nationalisation in January 1870.[57]

In urban areas the Post Office would relocate telegraph offices from outlying railway stations to urban centres or, in large urban areas, redistribute telegraph offices to allow for greater access by the populace, particularly in suburbs. In large urban centres rival telegraph companies had formed clusters of telegraph offices in the most lucrative areas where there was high demand. This reorganisation would bring a larger part of the city into the—one-and-a-half-mile—free delivery radius of each telegraph office, thereby increasing the utility of the service. An example of this latter policy was Liverpool. The telegraph offices upon nationalisation were clustered in the centre of the city with little coverage of outlying suburbs. Following restructuring, the city's offices were dispersed across the city and its suburbs (see the example of Liverpool, fig. 3.1-3.2). In contrast to such large-scale reconstruction, in small urban centres the telegraph line was extended to the town centre, on average three quarters-of-a mile.[58]

On 5 February 1870 the Post Office assumed control of the United Kingdom's inland telegraphs, with 1,007 postal telegraph offices in operation. This number had risen to nearly 2,000 by January of the following year. In addition,

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[57] *Report on reorganisation of telegraph system of United Kingdom*, 18-9, 20; *Account of Receipts and Payments by Postmaster General in respect of Telegraph Undertakings, to March 1873,* H.C. 1874 (90), xxxv, 27.
[58] *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill,* 9.

nearly 2,000 railway offices were opened to the public for the transmission of

messages on behalf of the Post Office. However, only 9% of telegraph messages

were relayed by railway telegraph offices, demonstrating the popular appeal of the

new central location of urban offices.[59]

By July 1871 the rationalisation and enlarging of the telegraph network was

nearing completion. This work had been significantly costlier than was envisaged in

1869. A number of factors had contributed to this: circuits between major towns had

been laid or enlarged and older lines had been reconstructed. In addition, the

extension of the telegraph to Jersey, Guernsey, Alderney and the Isle of Man, which

had not originally been envisaged, added to costs. Another significant cost was the

construction of a new seven-wire cable from Britain to Ireland, connecting Dublin to

Holyhead, and the replacement of the shore end of the Abermawr, Wales to Wexford

cable.[60]

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[59] *Report on reorganisation of telegraph system of United Kingdom*, 25, 31.
[60] *Reports received by Chancellor of Exchequer respecting financial results of transfer of telegraphs to government,* H.C. 1871 (378), xxxvii, 1-3.
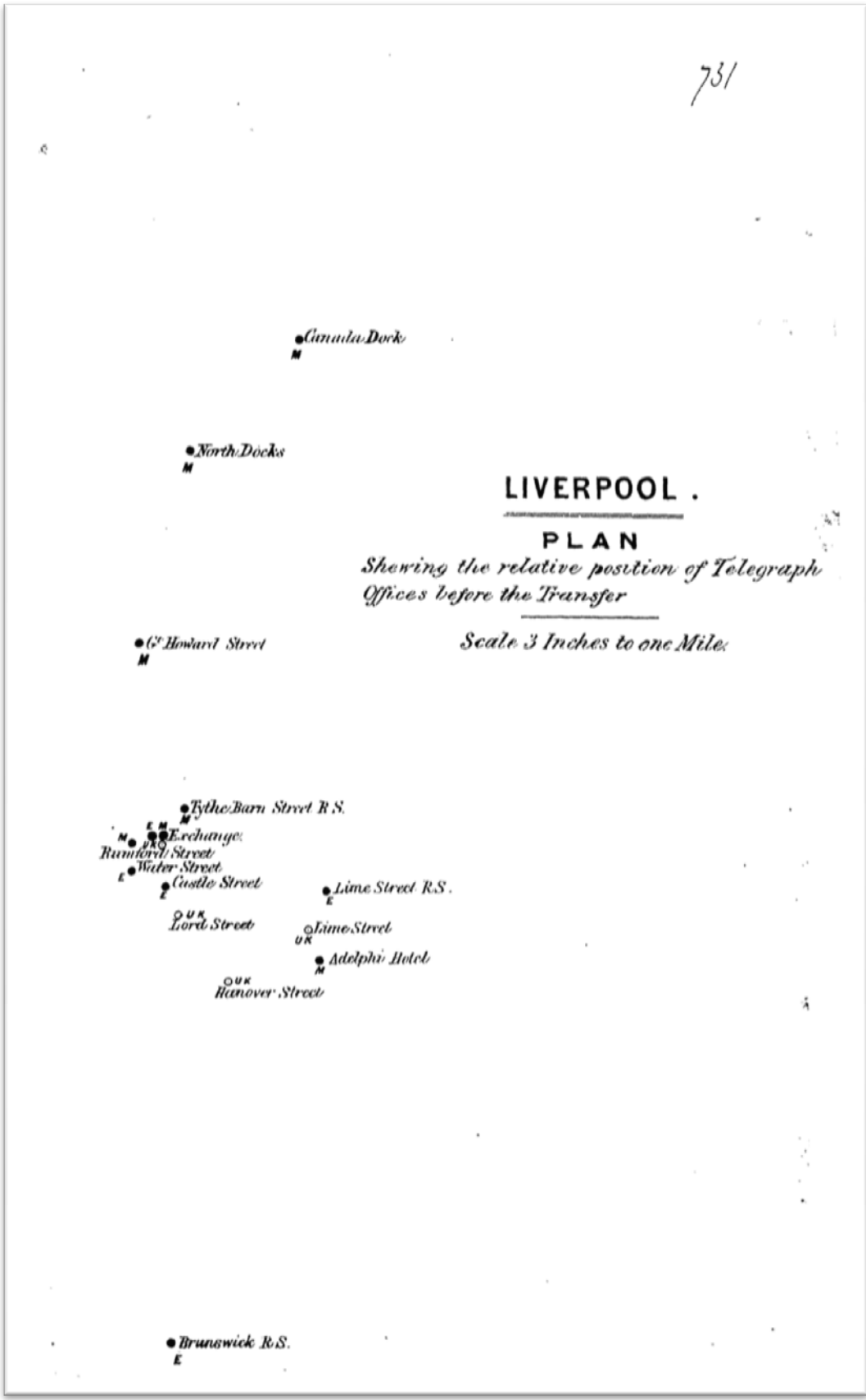
Fig. 3.1 Map showing the location of telegraph offices in Liverpool prior to nationalisation
Source: *Report on reorganisation of telegraph system of United Kingdom*, 22-3.

LIVERPOOL.

PLAN

Shewing the relative positions of the present
Postal Telegraph Offices

Scale 3 inches to a mile.

Fig. 3.2 Map showing the location of telegraph offices in Liverpool after postal reorganisation
Source: *Report on reorganisation of telegraph system of United Kingdom*, 22-3.

The reduced transmission rate led to a large increase in the volume of telegrams which greatly increased delays, particularly as a significant proportion of telegrams were dispatched from a relatively small number of telegraph offices and towns. This inhibited the operations of those who had traditionally used the telegraph, including 'stockbrokers, mining agents, shipbrokers, colonial brokers, racing and betting men, fish mongers, fruit merchants and others engaged in business of a speculative character, or who deal in articles of a perishable nature'. The disruption to their activities was such that they proposed the introduction of a higher 5*s.* rate for a special message that would be given priority for dispatch and delivery. While this proposal was not taken up by the Post Office, F. I. Scudamore, the undersecretary in charge of postal telegraphs, readily admitted that these delays were created by the sluggishness of the Post Office's construction and rationalisation works in light of the vastly increased demand for telegraphic services.[61]

The reconstruction and extension works undertaken by the Post Office led to a substantial increase in the size and complexity of the telegraph network. Upon nationalisation the total length of telegraphic wire, across the British Isles, was 51,311 miles; by 1871 this had increased to 63,319 miles. In the same period, the number of telegraph offices, in the United Kingdom, increased from 2,159 to 3,907, while the average number of weekly messages was up from 130,756 to 214,028.[62]

To meet the rise in demand the number of telegraph apparatus in service increased substantially in the period between nationalisation and 1871, from 1,869 to 4,104. There were multiple factors influencing this increase, the most obvious being the additional 1,748 stations. The types of machines brought into service are also

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[61] *Report on reorganisation of telegraph system of United Kingdom*, 17-8.
[62] *Telegraph clerks, & c, returns showing the number of clerks and messengers, with mileage of wire, and number of instruments, employed; the number of offices open, and average number of messages transmitted,* H.C. 1870 (442), xli, 1 (henceforth cited as *Telegraph clerks, returns*).

indicative of the nature of the new telegraph network. The number of Printer and Bright's Bell telegraphic apparatus in use increased, between nationalisation in 1870 and January 1871, by 489. Both of these operated using Morse code, transmitted information much faster than the Single Needle and A.B.C. telegraph apparatus and required experienced telegraph clerks to operate. The use of Hughes and Automatic apparatus increased from a lowly six to sixty-two in 1870. These machines needed highly-skilled operators and were used for transmitting substantial numbers of telegrams in a short time (fig. 3.3).

In contrast, the number of A.B.C. and Single Needle apparatus in service increased by 1,809, from 936 to 2,745 (fig. 3.3). Operating these machines required little instruction: the Single Needle apparatus used Morse code, the needle moving left to right to signal dots and dashes. This was the slowest telegraph apparatus that used Morse code and under Post Office ownership it was developed to allow for use in connection with a Bright's Bell apparatus. The A.B.C., also a very slow device, relayed messages using the alphabet—visible on the apparatus face—and was installed on rural circuits where its ease of use and bell, to alert users engaged in other activities, was ideal for the low volume of traffic—it did not need a trained clerk to operate.[63] It can be deduced from the increase in high-speed apparatus that there was an increase in the volume of messages on existing or new high-volume telegraphic routes. However, the main growth area, in terms of infrastructure, was in simple, slow machines that could be operated by those not dedicated exclusively to telegraphic work. This demonstrates that a significant proportion of telegraph

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[63] *Report on reorganisation of telegraph system of United Kingdom*, 75; Report of Mr Culley, 15 Mar. 1869, p. 12, in Adaption of the wires of telegraph companies to the Post Office system, p. 58 (BT archive, POST 30/191c).

extensions and new offices were in areas that did not have enough work to engage a full-time telegraph clerk.

Name of instrument	Number upon transfer in 1871	Number in 1871
A.B.C.	39	106
Single Needle	644	2,267
Bright's Bell	292	478
Printer	888	1,191
Hughes	Hughes and Automatic 6 machines in total	29
Automatic	See above	33
Total	1,869	4,104

Fig. 3.3 Amount and type of telegraphic apparatus in use upon nationalisation and on 5 Feb.1871
Source: Compiled by A. J. Kirwan from *Telegraph clerks, returns,* 1.

In addition to the provision of a public telegraph service the Post Office also operated numerous private wires throughout the United Kingdom. While the legislation had not given the Post Office a monopoly over private telegraphs, companies constructing and operating such wires could request that the government purchase them.[64] Responsibility for most private telegraph wires passed to the Post Office when it assumed control of the Universal Private Telegraph Company and the Economic Company's wires, 1 July 1870. The operation of these private wires was largely restricted to major urban areas, such as Dublin.[65]

In order to meet the increased demands of its new telegraph business, the Post Office was to vastly increase its workforce. Much of the staff belonging to the private telegraph companies were retained by various railway companies thereby putting even more pressure on the Post Office. While these staff losses had to be made good, the increasing number of telegraph offices would require numbers beyond those hitherto employed by the private companies.

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[64] *Report from the Select Committee on Post Office (telegraph department); together with the proceedings of the committee, minutes of evidence, and appendix*, H.C. 1876 (357), xiii, 61 (henceforth cited as *Report on telegraph department*).
[65] *Report on reorganisation of telegraph system of United Kingdom*, 37.

The Post Office also had difficulties with those experienced telegraph clerks that it did recruit. As each of the private companies had operated different telegraph apparatus most clerks could only work a limited number of devices. To address these difficulties the Post Office used experienced clerks to act as instructors, it also incentivised potential clerks by offering a £1 sterling reward for 'any postmaster, sub-postmaster, or receiver, or to any members of their families, or to any clerk, or sorter, or letter carrier who could to the satisfaction of an examiner display a certain proficiency in the manipulation of telegraph instruments.'[66] The broad range of learners is indicative of the wide range of postal telegraph offices that would be in operation, ranging in scope from the offices where the more rapid Morse or Bright's Bell instruments would be needed, to smaller sub-offices where the slower Single Needle would be adequate.

Trained in	No. of learners		Nature of proficiency				Total Number
	Male	Female	Two or more instruments	Single Needle	Morse	Bell	
London	139	196	_____	335	_____	_____	335
The Provinces	743	419	40	932	166	24	1,162
Scotland	114	93	3	140	58	6	207
Total	996	708	43	1,407	224	30	1,704

Figure 3.4 Table of telegraph learners awarded one pound sterling for demonstration of proficiency on telegraph apparatus
Source: *Report on reorganisation of telegraph system of United Kingdom*, 55.

While this method of training provided much needed staff (fig. 3.4), it proved to be insufficient to meet the needs of the Post Office which was to introduce telegraphy training schools. In Ireland the three main schools operated by the Post Office where in Dublin, Belfast and Cork. In Dublin the departmental school was located on College Green, presumably in or near the head-telegraph office, while

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[66] *Report on reorganisation of telegraph system of United Kingdom*, 54.

additional students undertook instruction at the Queen's Institution, which had

trained clerks for the B&I MTC. This arrangement allowed for an average of fifty-

eight pupils to undertake training in Dublin, eighteen at the departmental school and

forty at the Queen's Institution. In addition, Belfast and Cork had, on average, ten

and nine learners, respectively. The need for training and retraining in Ireland was

particularly strong as the vast majority of staff there had worked for the B&I MTC

which had its own telegraph code—Morse was to be adopted as the standard code by

the Post Office.[67]

The Post Office from the outset sought to train both male and female clerks

for telegraphic work. By 1871 this policy was already proving quite successful, with

42% of successful trainees under its £1 bonus scheme being women (fig. 3.4). In

addition, it brought back employees who had left telegraph work for other

occupations, borrowed staff from the railway companies, and re-employed female

staff who had been dismissed from their positions upon marriage.[68] Using these

methods, by August 1870 the Post Office was employing 4,913 telegraph clerks,

nearly double that employed by the private companies (fig. 3.5). Of these 2,418 had

been employees of the private telegraph companies; by 1876, 1,898 of these were

still employed by the Post Office. By this time the Post Office had reinstated the

policy of dismissing female employees upon marriage. In general female clerks

worked in the same conditions as their male counterparts. Both worked an eight-hour

day, with women's working hours restricted to daytime, that is, 8am to 8pm.[69]

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[67] *Report on reorganisation of telegraph system of United Kingdom*, 55, 57, 66.
[68] Ibid, p. 58.
[69] *Report on telegraph department*, 21-2.

	Clerks and assistants employed on telegraph work				
	Clerks of the Department		Assistants employed by the Postmasters		Total no. of clerks and assistants
	Male	Female	Male	Female	
England (excluding London)	1,610	48	452	457	2,567
Scotland	291	14	104	66	475
Ireland	255	84	60	7	406
London	482	728	124	131	1,465
Total	2,638	874	740	661	4,913*
Clerks employed by the telegraph companies prior to nationalisation					
	Clerks				
	Male	Female	Total		
United Kingdom	2,035	479	2,514		

* 768 Postmasters' assistants, only partially employed on telegraph duties, are included in this number.

Figure 3.5 Table showing number of telegraph operatives employed prior to nationalisation and by the Post Office, 31 Aug. 1870

Source: *Report on reorganisation of telegraph system of United Kingdom*, 58.

By 30 August 1870 the number of telegraph messengers was to double (fig. 3.6) due to the greater workload brought by increasing telegram volume and the relocation of telegraph offices to urban centres and suburbs. These messengers prior to nationalisation were not salaried employees but rather paid per delivery, at a variable rate depending on the office they worked in.[70]

Messenger boys were subjected to military-style discipline. Prior to beginning service they were required to take an oath before a magistrate and provide the Post Office with their address. They were also required, for training purposes, to attend four drills, which would include instruction on cleaning clothes. Once they commenced employment, strict rules were in place regarding uniforms and appearance which were enforced by daily inspections at the head Post Office in each district. Punctuality was expected and there was a strong hierarchical command structure. Indeed, the Post Office took pleasure in confirming that the messengers,

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[70] *Report on reorganisation of telegraph system of United Kingdom*, 80.

who had been 'irreclaimable scamps' when working for the private companies, had

under Post Office supervision been 'on the whole…well conducted.' While

discipline had improved, some of the boys managed to find time to play various

tricks, such as putting blacking into the tea of other boys and placing mice in the

pneumatic tubes. [71]

Post Office, 31 August 1870			Telegraph companies prior to transfer
Messengers			
Paid by the Department (regular messengers)	Employed by the Postmasters (some are only occasionally employed)	Total number of messengers employed on telegraph work	Messengers employed
2,802	314	3,116	1,471

Figure 3.6 Table showing number of messengers employed by the Post Office for telegraph work, 30 Aug. 1870 and the number prior to nationalisation
Source: *Report on reorganisation of telegraph system of United Kingdom*, 80.

The newspaper industry would also benefit from the new disposition. It

would see a dramatic change in the quality of intelligence delivered. Responsibility

for supplying intelligence was to be the concern of the newspapers themselves. A

group of provincial newspapers throughout the British Isles had formed a co-

operative in 1868 to collect and distribute intelligence: the Press Association. It

would distribute Reuters international telegraphic intelligence throughout the United

Kingdom and it was envisaged that it would not only improve 'intelligence' but also

reduce cost.[72] The Post Office would transmit intelligence to every newspaper on the

Press Association's list of subscribers.[73]

Following nationalisation a substantial part of the telegraph service's

operations was taken up in the relaying of increasing volumes of information for

various newspapers and business interests. The tariff for the news industry's

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[71] *Report on reorganisation of telegraph system of United Kingdom*, 81-2.
[72] *Belfast Newsletter,* 22 Nov. 1869.
[73] *Report on reorganisation of telegraph system of United Kingdom*, 82.

transmissions was reduced to 1*s.* for 100 words transmitted at night and seventy-five

words transmitted during the day, with the same intelligence delivered to additional

addresses at a rate of 2*d.* per address. The rate for rental of a private wire was also

reduced to £500 per annum which would be of considerable benefit to Irish

newspapers.[74]

The reduced price for newspaper transmissions was to have serious

consequences for the Post Office. By 1876 the cost of transmitting news

'intelligence' in Dublin was £2,363, while the cost of transmitting non-news related

telegrams was £716. A similar situation existed across the United Kingdom (fig.

3.7). Thus, with massively subsidised rates of transmission, the news industry was a

significant burden on the postal telegraph service and seriously undermined its

financial viability.[75]

Office	London	Edinburgh	Dublin	Belfast	Cork
No. Clerks, learners, &c.	1,629	307	394	153	112
Cost of wages	£94,063. 6*s.* 0*d.*	£13,202. 1*s.* 7*d.*	£19,416. 11*s.* 5*d.*	£7,755. 8*s.* 5*d.*	£5,307. 0*s.* 0*d.*
Cost of clerks e.t.c. employed exclusively on news work	£9,026. 3*s.* 8*d.*	£1,137. 3*s.* 0*d.*	£2,363. 6*s.* 11*d.*	£1,097. 4*s.* 0*d.*	- - -
Cost of clerks e.t.c. not employed exclusively on news work	£3,014. 8*s.* 0*d.*	£411. 11*s.* 0*d.*	£716. 10*s.* 0*d.*	£147. 8*s.* 11*d.*	£900. 0*s.* 0*d.*

Fig. 3.7 Table showing cost of news and non-news related messages in Dublin, Belfast and Cork, with London and Edinburgh for comparative purposes, 1876
Source: *Report on telegraph department,* 252.

Scientific and technological innovation

The rapid increase in workforce numbers and wages, bringing them in-line with

other civil servants, alongside the losses in transmitting news intelligence and free

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[74] Kieve, *The electric telegraph*, pp 216-7; Telegraph Act, 1868, 31 and 32 Vic. C. 110 31 (31 July 1868); Anon, *The Post Office*, p. 69.
[75] Kieve, *The electric telegraph*, pp 217-29.

messages for railway and canal companies brought pressure on the Post Office to reduce its workforce. Increased use of newer technologies such as the Bain printer telegraph apparatus—which was faster than the Morse and less prone to interruption due to bad weather—held out the hope of reducing staff numbers. The period following nationalisation saw increased use of automatic, high-volume telegraph apparatus. In addition, the Post Office introduced duplex telegraphy in 1871. This allowed a telegraph apparatus to simultaneously send and receive using the same telegraph wire, hence doubling the capacity of such lines. This was followed by the introduction of quadruplex working in 1878 and multiplex working in 1885. These, as their names suggest, allowed for a single wire to firstly receive and send two telegrams at once and later, with the introduction of multiplex, to transmit and receive multiple messages. While prone to atmospheric interference these technologies greatly increased the capacity of a telegraph lines.[76]

By 1876 the United Kingdom had a minimum of 100 circuits worked by duplex, a figure that represented about half the trunk lines between major cities. However, great difficulty had been encountered in attempts to implement quadruplex working due to atmospheric interference.[77] By 1906 duplex was used on automatic apparatus and working speeds of up to 400 words per minute were obtained on wires worked by such devices. Adaptations of telegraphic apparatus also reduced the number of wires require for transmission of high speed machines such as the Wheatstone Automatic (the main automatic apparatus used by the Post Office).[78]

The use of repeaters was another technical innovation that improved the efficiency of high-volume telegraph lines. A repeater was an automatic device that

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[76] *Report on telegraph department,* 21-2, 37; Anon, *The Post Office,* p. 71.
[77] *Report on telegraph department,* 54-5.
[78] Anon, *The Post Office*, p. 71; T.E. Herbert, *Telegraphy: a detailed exposition of the telegraph system of the British Post Office* (London, 1906), pp 291, 323.

physically repeated telegraph signals. The speed of transmission on underground and submarine lines was reduced by 'retardation' which increased the longer a telegraph wire was (ch. 2). A repeater would be introduced to the wire breaking it in two and thereby reducing retardation. If the transmission speed on a wire was 100 words a minute the introduction of a repeater would increase the speed by 2^2, thus the new speed would be 400 words per minute. This device was particularly useful on submarine cables, such as those between Ireland and Britain. These numerous improvements meant that a considerably larger number of telegrams could be sent over fewer lines on busy trunk routes.[79]

While new technology could increase capacity, these innovations were only important on high-volume telegraph lines. With two-thirds of traffic restricted to a few main trunk lines high-speed telegraph equipment could vastly improve the efficiency of such lines. On these main circuits, even with the improvements brought about with high-speed apparatus and duplexing, 'there were scarcely any wires that are [sic] not fully occupied'. However, despite these advances the majority of telegraph offices had low volumes of traffic and, as such, the system was heavily reliant on machines, such as the ABC telegraph apparatus, that were labour intensive and had added costs associated with maintenance. F.E. Baines felt 'that our subsidiary lines could, in many cases, carry a large amount of additional traffic.' Due to the expansion of these low-volume offices, technological advances would have only limited effect. [80]

The increase in employees, combined with pay rises and their placement on a civil service pay scale, led to a significantly enlarged wage bill. The cost of wages rose from £313,591 or 39% of revenue, in 1871, to £2,701,490 or 85% of revenue,

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[79] Anon, *The Post Office*, p. 71; Herbert, *Telegraphy,* p. 517.
[80] *Report on telegraph department,* 37, 64, 90.

by 1911.[81] This was a significant factor in the difficulties the telegraph service faced in maintaining its financial viability. In 1871, parliament authorised £1 million in capital for the postal telegraph service, bringing the total borrowed for the service to £8 million. Probably the biggest scandal surrounding expenditure arose in 1873, when it emerged that Scudamore had used £812,000 belonging to the postal Savings Banks and other Post Office sources to fund the telegraph service without permission. This episode marked the end of Scudamore's career and the introduction of the notion of ministerial responsibility.[82]

The telegraph network was to continue to expand throughout the nineteenth century. In the year 1879-80 the Post Office transmitted approximately twenty-six-and-a-half million telegrams. In 1874, however the rate of expansion slowed, with the number of telegraph offices increasing from 3,692 to 3,924. Revenue was never able to cover both operational costs and interest payments on the capital borrowed to purchase and upgrade the network. The ability of the service to pay its way was further reduced with the introduction of a 6*d.* transmission rate on 1 October 1885—this, unlike the prior rate, included the address in the word count.[83]

The years following 1885 demonstrated the conflict between the ideal of a cheap, reliable and widespread public utility and the reality of paying for it. While the volume of telegrams increased, to a peak of over 90 million per annum by the end of the century, the service became a loss-making enterprise. The extra revenue brought by increased telegram volume never covered the cost of the extra staff and equipment required to facilitate this increase. The privilege of free messages given to

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[81] C. R. Perry, 'The rise and fall of government telegraphy in Britain' in *Business and Economic History*, xxvi, no. 2 (1997), pp 416-25, at p. 424.
[82] Kieve, *The electric telegraph*, p. 179; Perry, *The Victorian Post Office*, pp 126-23.
[83] Kieve, *The electric telegraph*, pp 185, 195; *Post Office telegraphs, copy of Treasury minute with regard to the reduction of the minimum charge for Post Office telegrams*, H.C. 1883 (214), xxxviii, 1; *Telegraph Acts amendment, a bill to amend the Telegraph Acts, 1863 to 1878*, H.C. 1884-85 (121), vi, 1.

the railway companies in addition to the considerable losses made in the transmission of news intelligence added to these problems. In the 1890s the cost of these free telegrams was to be addressed by the Post Office. In 1891, 1.6 million free telegrams had been sent at a cost of over £80,000. The Post Office reached an agreement to limit the number of these messages, making significant savings in the process.[84]

Conclusion

The calls for nationalisation emanating from both commerce and the news industry demonstrate the importance attached to rapid communication. However, in order to secure the necessary support for nationalisation, expectations were raised of a more efficient service, with a wider spatial distribution and a reduced charge. These expectations were to have a serious impact on the development of telegraphy on the British Isles. The telegraph service would also be burdened with significant debt following the nationalisation process. Not only had the cost of purchasing the various telegraph companies, and their 'goodwill', far exceeded the original estimates but the need to meet the demands of the public was to place additional capital requirements on the embryonic service.

Nationalisation was to become more than simply the assumption of telegraphic operations by the state. Post Office control was deemed to be the panacea to the ills of the telegraph system. Postal officials and the newspaper industry had contributed to this with their evidence of the inferior service that was being provided by private industry in comparison to what a nationalised telegraph service could and should provide.[85] Therefore, while the government had expended much more on the

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[84] Kieve, *The electric telegraph*, pp 191, 195; Anon, *The Post Office*, p. 70.
[85] For examples see *Irish Times and Daily Advertiser,* 31 July 1869, 4 Feb. 1870.

acquisition of the telegraphs than it intended to, it would be difficult to resist further spending to meet the public's expectations.

In order to provide this, the Post Office would not only rationalise and expand the existing telegraph network but also significantly change the manner in which it operated. The introduction of a new nodal network—with more central urban offices, greater distribution of such offices in large urban centres and much wider spatial distribution of the network—would not only address many of the demands of the public but also enable the enlarged network to operate efficiently.

The Post Office seeking to reduce costs introduced a number of technological innovations—such as high-speed telegraph apparatus and duplexing. However, any labour saving or efficiency innovations introduced would have a limited impact on overall staff levels for a number of reasons: the spatial extent and nodal design of the telegraph network; increasing wages, in-line with public servants; and the losses made on transmitting intelligence. Consequently, the, administrative and physical, telegraph system constructed by the Post Office in response to the pledges and expectations made to the public and press during the nationalisation debate was responsible for the high staff levels. This shows that the technology and its application were shaped by public and political considerations which merged with the technological realities of a point-to-point telecommunications system, such as the telegraph, to produce a high-cost service.

The nationalisation debate framed the nature of the future postal telegraph service, which would be operated to provide maximum service at minimum cost to the public. In turn these operational criteria had a significant impact on the infrastructural and human organisation of the postal telegraph service in Britain, leading to significant financial losses by the late nineteenth and early twentieth

century. This was particularly true of the postal telegraph service's relationship with the newspaper industry. Here low transmission rates, particularly the 2*d.* rate for transmitting the same intelligence to additional address, seriously hampered the Post Office's ability to cover expenditure from revenue. While these generalisations of the course and impact of nationalisation hold true for Britain, Ireland's telegraphic infrastructure was less developed than Britain's upon nationalisation. There were also considerably fewer of the service's traditional customers, such as large merchants and industrialists. However, the expectations of an improved, cheap and comprehensive telegraph network were as widespread there as the rest of the United Kingdom. Consequently, an in-depth analysis of the Irish experience is needed to chart the development and impact of telegraphy on the island following nationalisation.

<center>**Chapter IV**</center>

<center>**The nationalised telegraphs in Ireland, 1870-1912**</center>

> The electric telegraph, the extension of railways, and the wonderful
> improvements that have been made in steam navigation, have done more to
> further the amalgamation of England and Ireland, than all the legislative
> enactments of the last half century
>
> <center>Anon., 'The day after the storm'.[1]</center>

Introduction

Upon nationalisation the Post Office had a number of goals for its new telegraph

service in Ireland. Firstly, it aimed to provide a service that would be more efficient,

cheaper and accessible, particularly in areas that hitherto had no telegraph provision

at all. Secondly, the new service aimed to generate sufficient revenue to cover its

expenses. As the Irish telegraph network would be part of a larger British entity, its

development would be shaped by expectations placed on it by a more urbanised and

industrialised English core. This chapter will ask if the upgrades that were envisaged

were required. What was the impact of this transfer of expectations and standards

from the English core to the Irish periphery? And what would be the impact of the

new standardised 1*s.* for the transmission of a twenty-word telegram anywhere

within the United Kingdom?

This chapter will trace the construction of a new unified telegraph network

across Ireland. The Post Office would carry out a number of infrastructural upgrades

which would allow it to unify the various networks of the private telegraph

companies, improve access to telegraphy and meet the extra demands which the new

standardised charge would bring. In order to achieve its aims extensive

infrastructural construction work would have to be undertaken. The new system

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[1] Anon., 'The day after the storm' in *Dublin University Magazine*, xxxviii, no. 223 (July 1851), pp 107-126, at p. 108.

would need additional rail-side telegraph lines, to increase capacity, and a significant number of lines along roadways, to provide telegraphy to areas hitherto denied the service. The Post Office would open a large number of telegraph offices throughout the country to provide greater access to this new national utility. These would need not only additional apparatus to meet demand but also more staff.

The chapter will then turn to the impacts of this process and enquire into how the promises of nationalisation would affect the provision of telegraphy in Ireland. It will trace the impact of nationalisation on the use of the service and seek to understand how wider economic factors were to influence the manner and extent to which the system was used. The chapter will finish by establishing if the nationalised telegraph network provided greater efficiency and improved access. Finally, it will ponder whether the enlarged telegraph network that emerged following nationalisation could be justified on the bases of cost, particularly as 'the Post Office would be bound in the interest of the nation to make its system self-supporting'.[2]

Upgrading the Irish telegraph network

The near hegemonic position of the British and Irish Magnetic Telegraph Company (B&I MTC) in Ireland meant that the new Post Office network would be based on the 'Magnetic' system.[3] Irish telegraphy upon nationalisation, 5 February 1870, was very underdeveloped in comparison to Britain. The island had considerably less commercial telegram traffic[4] and, as such, made greater use of dual-purpose wires to transmit both railway and commercial telegrams. Under the terms of the Telegraph

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[2] F.I. Scudamore evidence, in *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, H.C. 1867-68 (435) (465-I), xi, 8.

[3] Adaption of the wires of telegraph companies to the Post Office system, pp 18-20, 59, 94, 101-3 (BT archive, POST 30/191c); Letter F.I. Scudamore to E.B. Bright, [n.d.], in Extensions to the telegraph system on the acquisition by the Post Office of telegraph Companies (BT archive, POST 30/193D).

[4] British and Irish Magnetic Telegraph Co (formerly the English Telegraph Company) circuit returns `N' to `Z' and Scotland and Ireland (BT archive, POST 81/13). This source is indicative of the volume of Irish telegrams but is not comprehensive enough to allow for a statistical comparison.

Act, 1868, separate wires had to be laid for railway and commercial use. This would require substantial amounts of new rail-side wires, even if there was to be some reliance on dual-purpose wires as 'relief' wires.[5]

Much telegraph wire was in need of repair and additional lines were required to enable the relocation of telegraph offices from outlying railway stations to urban centres.[6] Finally, as Ireland's rail network was nowhere near as widespread as Britain's, substantially more roadside lines would be required to provide the wide geographical access to telegraphy that was envisaged. Indeed, Ireland's roadside network would require nearly as many new lines as that of England and Wales (fig. 4.1).

| | New work on Railways | | | | New local Road Work | | | |
| | Pole Work | | Wirework | | Pole Work | | Wire Work | |
	Miles	furlong	Miles	furlong	Miles	furlong	Miles	furlong
England and Wales	254	1	5587	5	2968	1	4639	5
Scotland	95	2	1157	5	1023	1	1383	1
Ireland	162	5	1981	4	2019	1	2508	4
Total	572	0	8720	6	6010	3	8530	2

Fig. 4.1 Table of new lines proposed to be laid in order to upgrade the Post Office telegraph network
Source: Adaption of the wires of telegraph companies to the Post Office system, p. 25 (BT archive, POST 30/191c).

Nationalisation was to have a significant impact on the provision of telegraphy in Ireland. Private enterprise would never invest the sums of money required to develop a system similar to that envisaged by the Post Office due to poor prospective returns. The Post Office, however, had established different criteria to judge the performance of its telegraph service. While private enterprise was solely concerned with producing a profit, the Post Office saw its role as providing a social

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[5] Adaption of the wires of telegraph companies to the Post Office system, p. 100.
[6] *Report on reorganisation of telegraph system of United Kingdom*, 703 [C 304], H.C. 1871, xxxvii, 25-6.

utility. This justified the massive expenditure in Ireland, to provide a similar service to that available in Britain.

To commence its operations in Ireland the Post Office had to come to terms with the railway companies in order to secure wayleave rights to operate telegraph lines along their routes. In addition, Irish railways companies, like their British counterparts, would charge the Post Office 3d. for every telegram despatched from a railway telegraph office. By 1876, with increasing numbers of Post Office telegraph offices, it was seeking to close as many railway offices as possible.[7] The telegraph continued to play an important role in the management of Ireland's railways. By 1873 of the 1,509 miles of single and double track railways in operation over 504 miles were controlled by some means of telegraphy, of this just over eleven miles by way of block signalling.[8]

Ireland had 2,400 miles of existing telegraph wire upon nationalisation. By 1871 significant infrastructural work was underway: 595 miles of existing wire had required replacement. In addition, 2,042 miles of new wire had been placed on existing railway-based telegraph poles; another 842 miles of telegraph wire still required erection in order to complete the separation of commercial and railway telegraph lines and add additional capacity to existing lines. The Post Office had also been busy in transferring telegraph offices from outlying railway stations to urban centres: 234 miles of telegraph lines had been erected along roadways in loops in order to provide for this. Thomas H. Sanger (ex-manager of B&I MTC's Irish

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[7] *Report from the Select Committee on Post Office (telegraph separtment); together with the proceedings of the committee, minutes of evidence, and appendix*, H.C. 1876 (357), xiii, 7 (henceforth cited as *Report on telegraph department).*
[8] *Return by railway companies in United Kingdom with respect to connections or crossings on level on lines of railway; railways in United Kingdom worked by telegraph block-systems*, H.C. 1873 (418), lvii, 46.
The majority of Irish railways being single track were operated using different versions of what was known as the staff or token system. A physical token was needed for entry into a section of single track. Therefore, once a train had entered a section of track no other train would enter it until it came into possession of the token from the other train.

operations and, now, the Post Office's divisional engineer in Ireland) stated, in 1871, that an additional 2,000 miles of roadside telegraph wire would be required to complete the Irish inland telegraph network. This would expand the telegraph network beyond the railway and allow for a wider geographical spread of the technology and its benefits.[9]

It was estimated that '3773 new instruments … vis 862 printers, 2357 single needles and 554 Bright's Bells' would be required to equip the new expansive telegraph network across the British Isles.[10] By 1871 engineers in Ireland had received, in addition to the telegraph apparatus that were already in use by the private companies, '327 single needle instruments, 68 inkers, 272 sets of acoustic instruments (i.e. Bright's Bell's), 24,636 battery cells and 496 descriptions of other apparatus.'[11] These apparatus would be operated using Morse Code, which had been used by the B&I TC and was to become the standard code of the Post Office telegraph service.

The upgrading of Ireland's telegraph network, while significant, would leave the island with nowhere near the amount of telegraph infrastructure that mainland Britain possessed (fig. 4.2). This is not surprising considering the vast differences between the two islands in terms of population, urbanisation and industrial development, three of the central criteria for telegraph demand. Britain (excluding London), in addition to a substantially larger amount of telegraph apparatus, had nine Wheatstone Automatic and six Hughes Type telegraph apparatus, both used for high-volume transmission. However, in Ireland only the Dublin to London circuit was fitted with a high-speed apparatus. This demonstrates that the volume of telegraphic

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[9] *Report on reorganisation of telegraph system of United Kingdom*, 26.

[10] Adaption of the wires of telegraph companies to the Post Office system, pp 25-9.

[11] Sanger's report, in *Report on reorganisation of telegraph system of United Kingdom*, 26.

traffic in pre-nationalisation Britain was significantly greater than in Ireland (fig. 4.3).
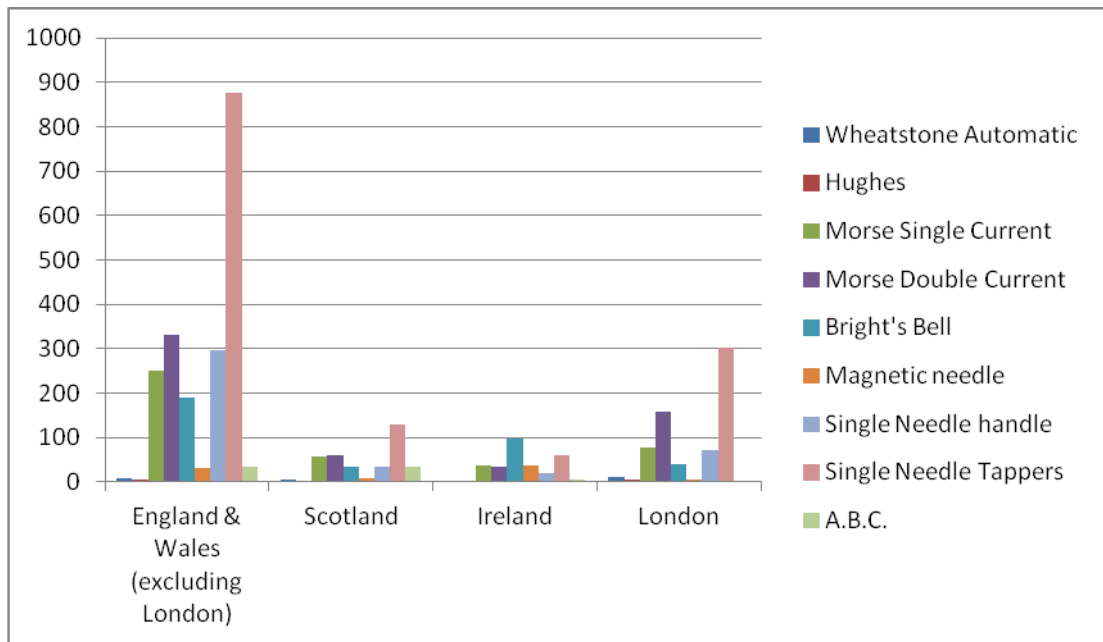
Fig. 4.2 Number of instruments in use on 31 August 1871 following nationalisation (N.B. one high-speed telegraph apparatus (i.e. Wheatstone of Hughes) was installed in Ireland by the Post Office which is too small to show on this chart)
Source: *Report on reorganisation of telegraph system of United Kingdom*, 84.
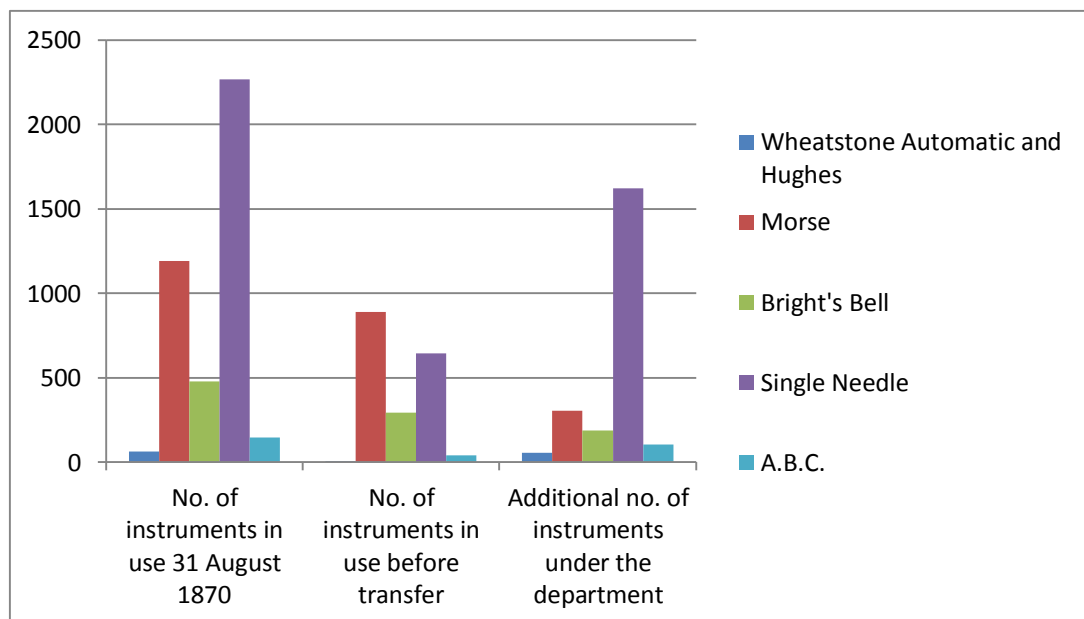
Fig. 4.3 Increase in instruments across the United Kingdom following nationalisation (There were six high-speed telegraph apparatus (i.e. Wheatstone and Hughes) in use by the private companies a number too small to show on this chart)
Source: *Report on reorganisation of telegraph system of United Kingdom*, 84.

Most of this upgrading work was based on a report by Sanger and F.E.

Baines carried out in 1870. This report demonstrated the impact of nationalisation;

telegraph lines were under pressure 'due to the reduced and uniform tariff, as well as the transmission of news'.[12] The central feature of Baines' and Sanger's report was the belief of Post Office employees that enlarging and improving Ireland's telegraph network would in turn increase the use of the service.

Ireland was to form a division of the new postal telegraph service and T.H. Sanger was placed in overall charge.[13] Sanger had been superintendent of the B&I MTC's operations in Ireland and in petitioning for his job stated that his 'appointment would meet with the approval of the mercantile community of Ireland and the Irish Press'.[14] While a centralised financial administration in London appealed to officials as preferable for the proper and efficient management of the Post Office, attempts at such a centralisation had provoked opposition. In a demonstration of national and civic pride 'the government were almost eaten up for it by the people of Dublin' and a separate financial administration remained in the Irish capital.[15]

Ireland's telegraph wires, in contrast to Britain's, were wholly maintained by the Post Office.[16] This situation was deemed superior to the dual maintenance —where the railways companies maintained rail-side lines—that existed in Britain.[17] By 1876 the Irish network was maintained by thirty-seven permanent linesmen; with an additional thirty employed as temporary labour. This brought the total engineering

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[12] Post Office telegraphs, report No. 3, Irish division, southern sub-division, in *Ireland, reports on circuit arrangements, Dublin,* 1870 (London, 1871), p. 12 in Circuits revision in the United Kingdom 1870-1871 (BT archive, TCB 604/1, formerly POST 82/80).

[13] *Report on telegraph department,* 1, 36; *Correspondence between Treasury and Postmaster General on charges in telegraph dept. in consequence of recommendations of Select Committee on telegraphs, 1876*, H.C. 1877 (236), xlix, 3.

[14] T.H. Sanger to Lord Mayo, Lord Lieutenant of Ireland, 20 Sept. 1867, in Larcom papers: Letters and cuttings, Peel and Larcom, controversy between Peel, O'Donoghue and Fr Lavelle, telegraph line between London and Cobh, 1862 (NLI, Ms. 7583).

[15] *Report on telegraph department*, 5.

[16] Report from the Surveyor General for Telegraphs to the secretary, p. 24 (1875), in Telegraphs, acquisition by the State, various reports and papers from 1855 (BT archive, POST 30/306).

[17] *Letter from Postmaster General to Treasury, on report of committee to investigate causes of increased cost of telegraph service*, H.C. 1876 (34), xlii, 7 (henceforth cited as *Letter to Treasury ... increased cost of telegraph service*); *Report on telegraph department,* iii-iv.

force to 102 and put the relative cost of maintaining the Irish telegraph network on a par with the rest of the United Kingdom. [18]

Developments in submarine telegraphy

The introduction of a 1*s.* rate to transmit a telegram to anywhere in the British Isles led to substantial increases in the volume of Irish telegams (fig. 4.4). However, continued delays in transmitting messages to Britain were deemed to be the cause of the lacklustre increase in cross-channel telegrams (fig. 4.5). By 1873, Dublin's stockbrokers had actual decreased their use of the telegraph service to Britain due to delays caused by the increased telegram volume. To rectify these delays senior engineers in the Post Office were already proposing a new submarine cable, in addtion to the one constructed between Dublin and Holyhead in 1870.[19]

As in the era of private ownership, telegraphic connectivity between the two islands was a central concern to the Post Office (ch. II).[20] Upon nationalisation there were three cables connecting Ireland to Britain. Of these, the two owned by the B&I MTC, laid between Scotland and the Antrim coast, were over sixteen years old. The first of these, known as the 'Magnetic', had been laid by the English and Irish Magnetic Telegraph Company (E&I MTC) in 1853, while the second, known as the 'British', had been laid by the British Telegraph Company in 1854.

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[18] *Report on telegraph department*, 29, 61.

[19] Memorandum on the improved communication between London and the west of England and the South of Ireland; also between the western and midland counties of England (London, 1871), pp 13, 24, in Circuits revision in the United Kingdom 1870-1871 (BT archive, TCB 604/1, formerly POST 82/80).

[20] *Ireland, reports on circuit arrangements*, p. 45.
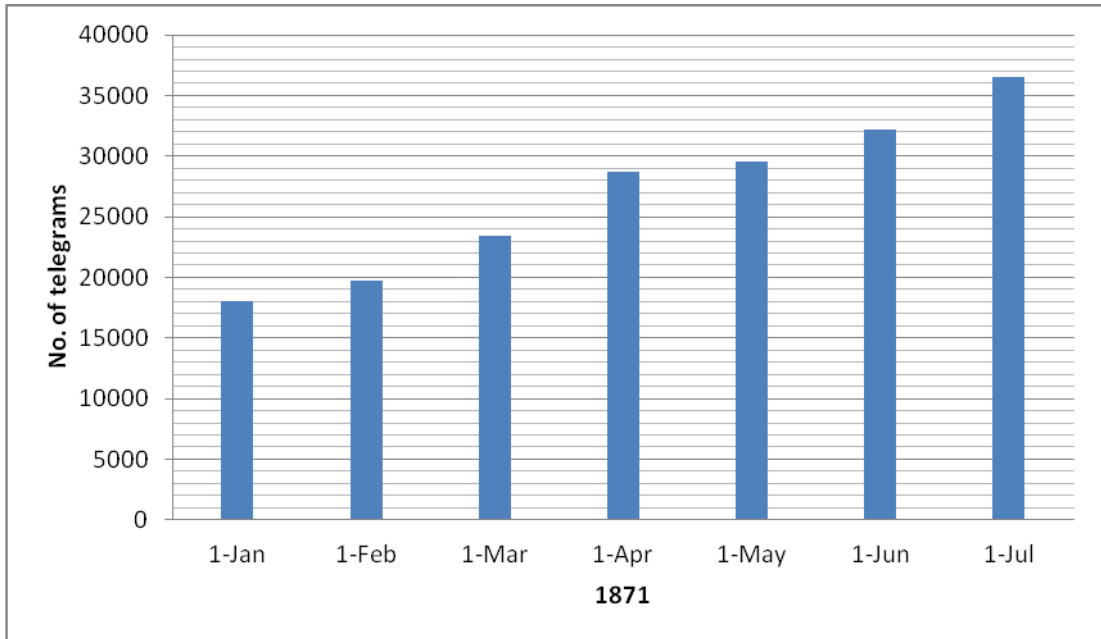
Fig. 4.4 Number of inland telegrams transmitted in Ireland over a four-week period leading up to the dates shown in 1871
Source: Memorandum on the improved communication between London and the west of England and the South of Ireland; also between the western and midland counties of England (London, 1871), p. 12, in Circuits revision in the United Kingdom 1870-1871 (BT archive, TCB 604/1, formerly POST 82/80).
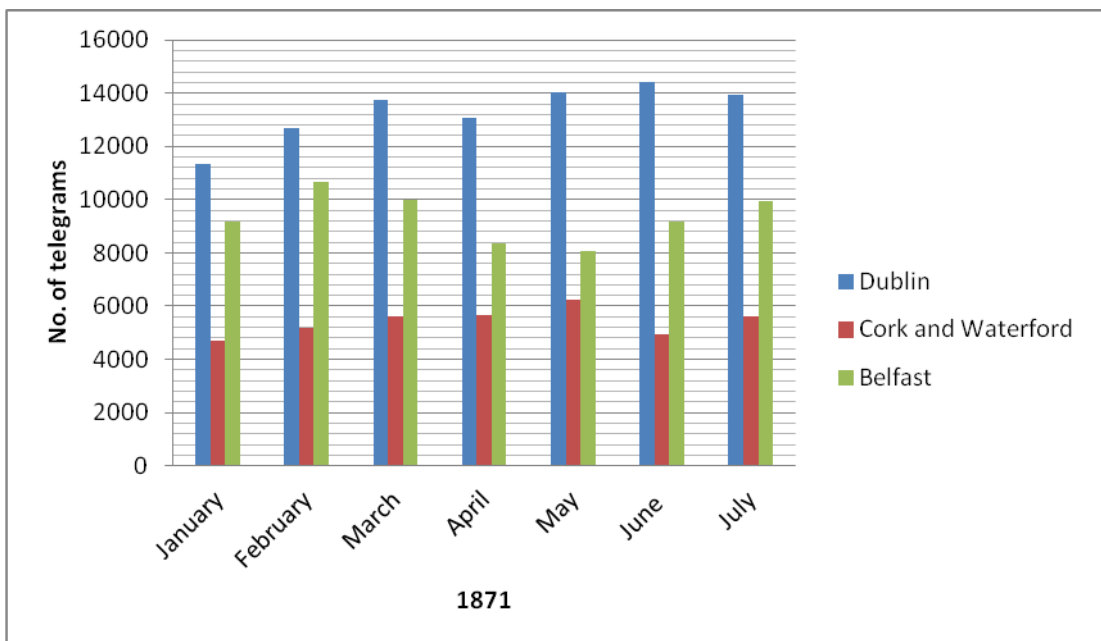
Fig. 4.5 Number of telegrams transmitted from various cities in Ireland to Britain over a four-week period leading up to the dates shown in 1871
Source: Memorandum on the improved communication between London and the west of England and the South of Ireland; also between the western and midland counties of England (London, 1871), p. 13 in Circuits revision in the United Kingdom 1870-1871 (BT archive, TCB 604/1, formerly POST 82/80).

By 1870 both of these cables were deemed to have sub-standard insulation. While they would remain operational due to their relative shortness—which reduced induction and increased transmission speeds—, they had become outdated owing to technological advances in submarine telegraphy. The cables had become so dilapidated that there were serious difficulties locating faults, as a working wire was needed to aid in this process. The considerable work done to both cables by the B&I MTC in the years preceding nationalisation had little effect on their efficiency. While considered heavy cables when laid, the Post Office's engineer's report stated that heavier cables would now be required, as this would increase their effectiveness. Of the twelve wires contained in the two cables only one was operating at anything approaching sufficient efficiency. Nonetheless, it was felt that 'with judicious management several wires can from time to time be selected through which correspondence can be fairly well maintained.'[21] However, by May 1870 delays of two to three hours were not uncommon on this northern route.[22]

The poor quality of the submarine cables was to cause numerous delays. In addition to those from Dublin and Belfast to Britain, transmission between Cork and London could take up to five hours. This meant that messages transmitted after twelve noon would not reach their destinations in London until after many businesses had closed at five o'clock.[23] Some customers were to suggest the introduction of a 5*s.* charge for priority telegrams but this was not acted upon.[24] To rectify these inefficiencies a new, four-wire, cable was laid between Port Patrick and

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[21] Report on the British and Irish Magnetic Telegraph Company's Cables to the secretary of the General Post Office, 9 Dec. 1868, in Transfer of telegraphs, classification in Provincial Offices (BT archive, POST 30/224C).
[22] *Ireland, reports on circuit arrangements,* p. 45.
[23] Ibid, p. 46; also in F.J. Cullen, 'Local government and the management of urban space: a comparative study of Belfast and Dublin, 1830-1922' (NUI Maynooth, 2005), pp 187-8; Cullen, 'Harbour, rail and telegraph: the Post Office and communication in nineteenth-century Dublin', p. 183.
[24] *Report on reorganisation of telegraph system of United Kingdom*, 18.

Donaghadee and a new seven-wire cable was ordered from the India Rubber and Gutta Percha and Telegraph Works Company, at a cost of over £45,000, to connect Dublin to Holyhead (the Dublin to Holyhead cable of the E&I TC had failed prior to nationalisation and the company had been reliant on their Wexford to Wales cable for the transmission of telegrams to Britain (ch. II)). In addition, the shore end of the submarine cable at Wexford was replaced, at a cost of £9,988.[25] Sanger reported that upon completion Ireland would have ample capacity for present and future demand.[26] Despite Sanger's enthusiasm for an enlarged network his predictions were to be proved wrong and these cross-island cables quickly reached capacity.

Ireland's role in transatlantic communication was also given due consideration in the reconstruction of the island's telegraph network. The Post Office had paid £10,133 to Lord Fermoy for the purchase of the Roche's Point Telegraph. This was an extension to the London and South of Ireland Telegraph Company's[27] line which allowed for the interception of messages from transatlantic steamers.[28] This 170-mile landline had been extended to connect with the Anglo-America transatlantic cable at Valentia. The whole of this line, from Valentia to the submarine cable at Waterford, was completely replaced and a new four-line submarine cable between Valentia Island and the mainland was laid.[29] In the year ending 31 March 1875 the Anglo-American Telegraph Company had used this line to transmit over 200,000 messages from its terminus at Valentia to London. For providing this

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[25] *Account of receipts and payments by Postmaster General in respect of telegraph undertakings, to March 1873,* H.C. 1874 (90), xxxv, 10 (henceforth cited as *Account in respect of telegraph undertakings*).
[26] *Report on reorganisation of telegraph system of United Kingdom*, 26.
[27] This was a subsidiary of the Electric and International Telegraph Company.
[28] *Account in respect of telegraph undertakings,* 7.
[29] *Report on reorganisation of telegraph system of United Kingdom*, 26.

service the Post Office earned £6,074 with the Anglo-American company providing the telegraph clerks.[30]

The focus of these upgrades was on improving communication between Ireland's main cities and Britain. This construction would give Dublin, Belfast and Cork additional circuits to a number of British cities. This included seven direct telegraph circuits to London, signifying a considerable increase in connectivity to the city (fig. 4.6). By August 1874 the additional Dublin to Holyhead cable had been completed. At this point there were twenty-two operational wires for communication between Britain and Ireland. These were allocated as follows: Dublin, nine wires; Belfast, eight wires, Cork, one wire; Waterford, one wire; Londonderry, one wire; finally, two wires of the Wexford to Wales telegraph line were allocated to traffic from the Atlantic submarine cables. These wires put London, Manchester, Liverpool, Newcastle, Glasgow and Stranraer in direct communication with Ireland.[31]

Significant progress was also made on improving those telegraph lines in Britain that acted as conduits between London and Ireland. Large parts of the existing land-lines connected to the Irish submarine cables in Scotland were replaced. In addition, Wheatstone Automatic apparatus were installed at each end of the London to Dublin line to increase the capacity.[32] This instrument could transmit telegraphs at a rate of up to 400 words per minute but it seems unlikely that anything approaching this speed was reached on this line.[33]

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[30] Observations by the Receiver and Accountant General of the Post Office upon the Report of the committee appointed by the Lords Commissioners of Her Majesty's Treasury to investigate the causes of the increased cost of the telegraph service since the acquisition of the telegraphs by the state, p. 12, in Telegraphs, acquisition by the state, various reports and papers from 1855 (BT archive, POST 30/306).

[31] Thomas Wall, 'Some notes towards a history of telecommunications with particular reference to Ireland' Unpublished paper, 2005 (NLI, call no. 5B 180), pp 47-8.

[32] *Report on reorganisation of telegraph system of United Kingdom*, 26-30.

[33] This assumption is based on the later introduction of a Hughes printer, which was introduced to this route increasing its transmission speed yet it operated at a considerably slower rate than 400 words per minute, see Memorandum on the improved communication between London and the west of
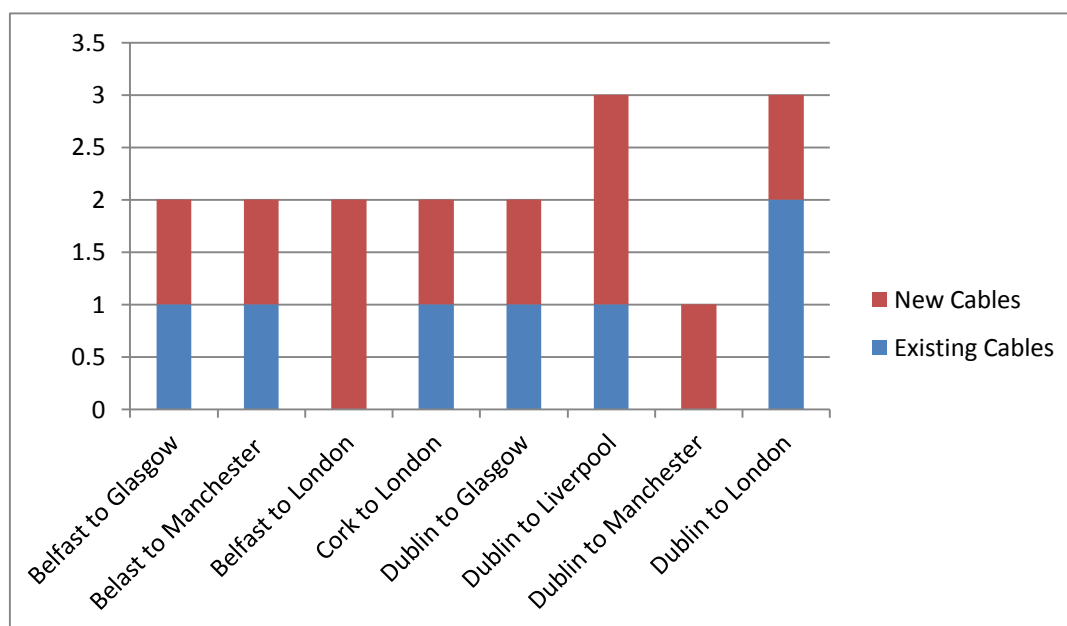
Fig. 4.6 New and existing telegraphic submarine cables between Irish and British cities, 1870
Source: *Report on reorganisation of telegraph system of United Kingdom*, 85.

The impact of nationalisation

The expectation of increased access to telegraphy that was raised during the
nationalisation debate was met. By 1876, the number of telegraph offices in Ireland
had reached approximately 600.[34] This provided improved access to many, but the
problem of low usage that had restricted the growth of the technology in the period
of private ownership continued. As in Britain many of the new offices did not
initially cover their costs. However, while the number of offices in Ireland that fell
into this category numbered 261 in 1872, it had fallen to seventy-two by 1875. This
reduction shows that the provision of telegraph offices, even if not profitable
initially, could induce greater use of the service over time, particularly when
combined with the new 1*s.* rate for transmission. In fact, Ireland witnessed a more
substantial decrease in the number of uneconomic telegraph offices compared to
England, excluding London (fig. 4.7).

England and the south of Ireland; also between the western and midland counties of England
(London, 1871), p. 12.
[34] *Report on telegraph department,* 247.

Year	London	Rest of England	Scotland	Ireland	Total uneconomic offices	Total Offices
1872	10	417	40	261	728	3,444
1874	7	303	28	111	449	3,692
1875	0	150	6	72	228	?

Fig. 4.7 Telegraph offices in the United Kingdom not covering their operational costs, 1872, 1874, 1875
Source: Redrawn by A.J. Kirwan from *Report of Treasury Committee to investigate causes of increased cost of telegraph service since acquisition of telegraphs by state; correspondence*, H.C. 1875 (1309), xx, 8; *Letter from Postmaster General to Treasury, on report of committee to investigate causes of increased cost of telegraph service, H.C. 1876 (34), xlii, 7* (henceforth cited as *Letter to Treasury ... increased cost of telegraph service*, 6.

While uneconomic telegraph offices would never have been retained by private companies, the Post Office was in a difficult position. It was answerable to the public and as such 'the closing of an office which does little business would in most cases be attended with great discontent and agitation on the part of those who never use it.'[35] Hence, the telegraph service's new position as a publically-owned utility meant that many uneconomical offices that would never have even been opened under private ownership were retained.

Substantial work was undertaken to boost the interconnection between Britain and Ireland. Probably the most important development was the introduction of the standard 1*s.* transmission rate between any two points within the United Kingdom to replace existing charges of 3-4*s*. While there had been 4,791 inter-island telegrams over a six-day period just prior to nationalisation, this number had risen to 12,375 in the week ending the 23 April 1870.[36] By July 1871 this number reached 16,083, with Belfast transmitting 4,938; Dublin, 8,283; and Cork 2,862. The increase was such that by July 1871 the newly-laid submarine cables were at times operating

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[35] *Report of Treasury Committee to investigate causes of increased cost of telegraph service since acquisition of telegraphs by state; correspondence*, H.C. 1875 (1309), xx, 8.
[36] *Ireland, reports on circuit arrangements,* p. 44.

at full capacity and talk of an additional cable was taking place.[37] By 1875 there

were nearly 1,400,000 telegrams per annum passing through the telegraphic cables

connecting Ireland and Britain.[38]

The, newly-promoted, Surveyor General of the Telegraphs, F. E. Baines, felt

that this service was a considerable financial drain as these telegrams passed through

not only the telegraphic submarine cables but 'also over great lengths of inland wire

ranging from 100 to 300 or 400 miles, and therefore in strictness only a fraction of

the initial shilling is earned by the cables'. Thus, the 1*s.* rate did not cover the cost of

transmitting these messages never mind the maintenance of the submarine cables and

landlines. This is another example of the benefits that Ireland gained from the

nationalisation of the inland telegraphs and, due, as demonstrated by Kieve and

Perry, to the Post Office's view of the telegraphs as a public service rather than a

revenue source (ch. III).[39]

For the provinces telegraphy allow more rapid access to time-sensitive

information, such as stock prices. The private telegraph companies had operated with

multiple centres of business; for example, the E&I MTC's network had been centred

on Manchester and the industrial north of England. The reconstruction and

unification of the telegraph networks by the Post Office made connectivity to

London a central feature of the new network.[40]

By the turn of the century many cities in Ireland had direct access to British

cities, while others could transmit telegrams to Britain through Dublin, Cork,

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[37] Memorandum on the improved communication between London and the west of England and the
South of Ireland; also between the western and midland counties of England (London, 1871), pp 11-2.
[38] Report of the Surveyor for Telegraphs, 7 Sept. 1875, in Telegraphs, acquisition by the state, various
reports and papers from 1855 (BT archive, POST 30/306), p. 30.
[39] Report of the Surveyor for Telegraphs, 7 Sept. 1875, in Telegraphs, acquisition by the state, various
reports and papers from 1855 (BT archive, POST 30/306), p. 30; see Kieve, *The electric telegraph*
and Perry, *The Victorian Post Office*.
[40] Roland Wenzlhuemer, *Connecting the Nineteenth-Century World: The Telegraph and
Globalization* (Cambridge, 2013), pp 163-99.

Waterford, Londonderry, Limerick and Belfast (fig. 4.8). The demand for telegraphic communication was to increase throughout the late-nineteenth century. In 1899 a further cable was laid across the Irish Sea; however by 1902 the Post Office was reporting that 'Irish Cross Channel traffic shows a considerable increase'.[41] As a new wire had been promised to the Anglo-American Telegraph Company, Post Office officials felt that a new submarine cable, with four wires should be constructed. This would give a wire to the Anglo-American Telegraph company and one to Cork. The final two wires, it was felt, would be of most service if dedicated to Belfast as the bulk of the increase in traffic between the two islands originated here. Thus, even after the laying of the first telephone cable between the islands in 1893 telegraphic communication was still growing.

This increase in cross-channel connectivity again underlines the importance of the link to Britain for Irish telegraphy. It also emphasises that Dublin was never to have the same central position in the Irish telegraph network that London held in Britain. While other cities in Britain were important telegraphic nodes, London was to remain by far the biggest which in turn led to a centralisation of the telegraph network on that city. In a demonstration of technological agency this centralisation was not to be repeated in Ireland. While Dublin was still the central administrative centre and had a considerable amount of telegraphic connectivity to the rest of the island, the fact that the majority of submarine cables to Britain were located in counties Antrim and Waterford meant that alternative routes to Britain, by-passing Dublin, were quicker and more efficient (fig. 4.8). The interconnectivity demonstrated in figure 4.8 and the demand of additional interconnectivity between

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[41] Letter to Treasury, 28 June 1902, in Additional Irish cable from Trescastell to Howth, 1898-1902 (BT archive, POST 30/979C).

provincial Irish and British cities demonstrates the role of the telegraph in integrating the economies of the two islands. [42]

	Dublin	Belfast	Cork	Waterford	Londonderry	Limerick
London	5	3	2	1		1
Manchester	2	2	1			
Liverpool	3	2	1			
Birmingham	2					
Glasgow	2	3			1	
Leeds		1				
Bristol			1			

Fig. 4.8 Cross-channel wires between Irish and British cities, 1901
Source: Average traffic on each of the Dublin cross-channel circuits, taken from six tablet returns; Average traffic on Belfast cross-channel circuits, six tablet returns; Average traffic on Cork principal circuits, taking an average from the last six tablets; Waterford average traffic on principal circuits taking on average from the last six tablets; Average traffic on Londonderry circuits Belfast, Glasgow and Dublin, taking six tablets; average traffic on Limerick principle circuits (average taken from six tablets ending 19 Oct. 01); in Additional Irish cable from Trescastell to Howth, 1898-1902 (BT archive, POST 30/979C).

The impact of nationalisation in Ireland's urban centres

Across the British Isles the Post Office was to engage in significant restructuring and expansion of the telegraph infrastructure of large towns. The telegraph offices of the various private companies had clustered in important financial districts denying much of the city access to the free delivery of telegrams, which was restricted to a one-and-a-half mile radius of the telegraph office. The Post Office planned to amalgamate the offices of the various private companies and extend urban networks to provide telegraphic access to merchant, trade and suburban districts (ch. III). Substantial improvements were to take place in Ireland's three main urban centres of Dublin, Belfast and Cork. These cities—reflecting the nodal nature of the telegraph network (ch. III)—would also be responsible for the transmission of telegrams from their respective hinterlands to Britain.[43]

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[42] Letter to the Secretary J. Newlands, 2 Dec. 1901; A return of telegrams passing between Cardiff and Cork and places for which those offices transmit, in Additional Irish cable from Trescastell to Howth, 1898-1902 (BT archive, POST 30/979C).
[43] *Ireland, reports on circuit arrangements,* pp 45-8.

For Cork, with its 'foreign trade, its corn and butter markets, and its general prosperity',[44] important improvements in its telegraph infrastructure and connectivity were planned. During the nineteenth century the Cork butter exchange was the largest in the world. In 1835 nearly one-third of the volume of Irish exports consisted of butter from Cork. In the second half of the century Cork merchants controlled around fifty percent of butter exports to Britain and approximately thirty percent of the Irish butter market. While Cork's merchants exported the majority of their butter to Britain, a substantial amount was re-exported throughout the world, normally through other European ports.[45]

Given the prominence of British markets for agricultural goods, speedy communication was of the utmost importance. Irish butter during the nineteenth century was under increasing pressure to compete with superior butter from Denmark, as well as the cheap substitute margarine. This challenge was intensified by lack of winter milk in Ireland and the low transportation rates that the introduction of steamships had brought; these innovations meant that it was cheaper for consumers in Dublin to buy Dutch butterine (a mix of oleomargine and butter) than Cork butter.[46] The growth in Dutch imports meant that Cork's exporters had to deal directly with provincial retailers rather than with middlemen in the main British ports.[47] Hence any advantage that the telegraph could bring, such as access to markets and the rapid relaying of butter prices from Cork to the rest of the British Isles, would be welcomed by Irish agricultural, and industrial, exporters.

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[44] *Ibid,* pp 45-8.

[45] J.S. Donnelly, Jr, 'Cork market: its role in the nineteenth century Irish butter trade' in *Studia Hibernica,* xi (1971), pp 130-163, at pp 130-131.

[46] E.R.R. Green, 'Industrial decline in the nineteenth century' in L.M. Cullen (ed.), *The formation of the Irish economy* (Cork, 1976), pp 89-100, at p. 98; L.M. Cullen, *An economic history of Ireland since 1660* (2nd ed., London, 1987), pp 154-5; Cormac Ó Gráda, *Ireland: a new economic history 1780-1939* (Oxford, 1995), p. 259.

[47] Donnelly, 'Cork market: its role in the nineteenth century Irish butter trade', pp 144-5.
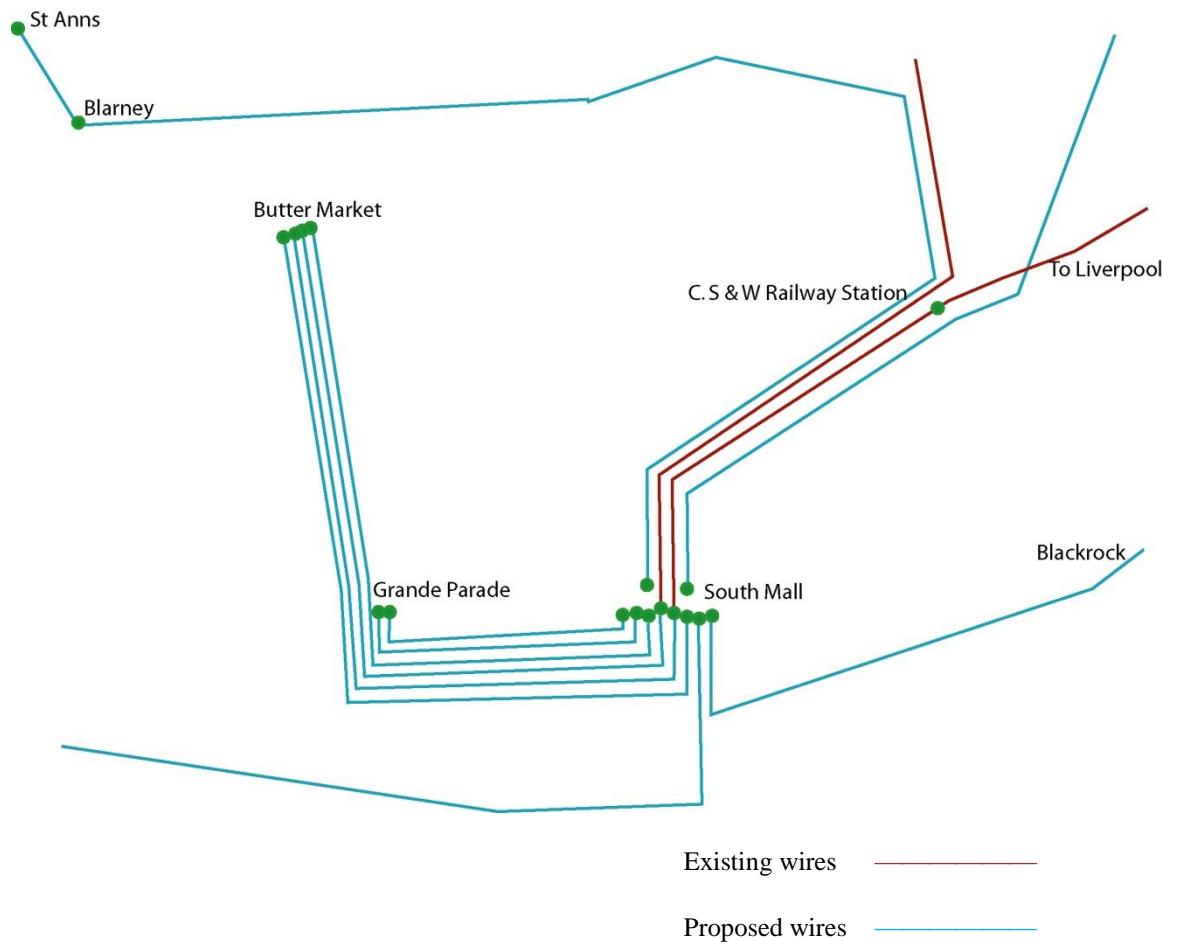
Fig. 4.9 Existing and proposed telegraph lines in Cork city, 1870
Source: *Ireland, reports on circuit arrangements,* pp 45-8.

Indeed exports were becoming much more important to the country as a whole; for example, in 1815 the value of Irish exports was near that of the rent roll of Irish landlords yet by the 1890s it had risen to five times the rent-rolls' value.[48] The importance of exports to the Irish economy was to continue and by 1913 it was around half of the national income, which was high by international standards.[49] Added to the concerns of Irish butter merchants; the high volumes of Cork butter exported to Britain and abroad combined with the fluctuations in butter prices meant that many would be interested in the price of butter.[50]

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[48] Cullen, *An economic history of Ireland since 1660*, p. 170.
[49] Ó Gráda, *Ireland: a new economic history, 1780-1939*, p. 270.
[50] Donnelly, 'Cork market: its role in the nineteenth century Irish butter trade', pp 138-9.

In August 1870 Cork had only two telegraph offices: one, at the outskirts of the town, at the Glanmire railway station, and the other at the postal telegraph office on the South Mall. This office was well located to service the merchant class of the town but was away from the central shopping areas and the town's tradesmen. It was felt that the telegraphic service to the general public was 'very limited' and, accordingly, it was proposed to increase the number of offices serving the city (fig. 4.9). An office would also connect the 'centre of the butter trade' to the telegraph network. This connection was deemed important not just for Irish markets but also British, the Post Office attempting to devise 'some means of accelerating the transmission of various parts of England to the butter exchange at Cork'.[51]

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[51] *Ireland, reports on circuit arrangements*, pp 45-8; Memorandum on the improved communication between London and the west of England and the South of Ireland; also between the western and midland counties of England (London, 1871), p. 15.
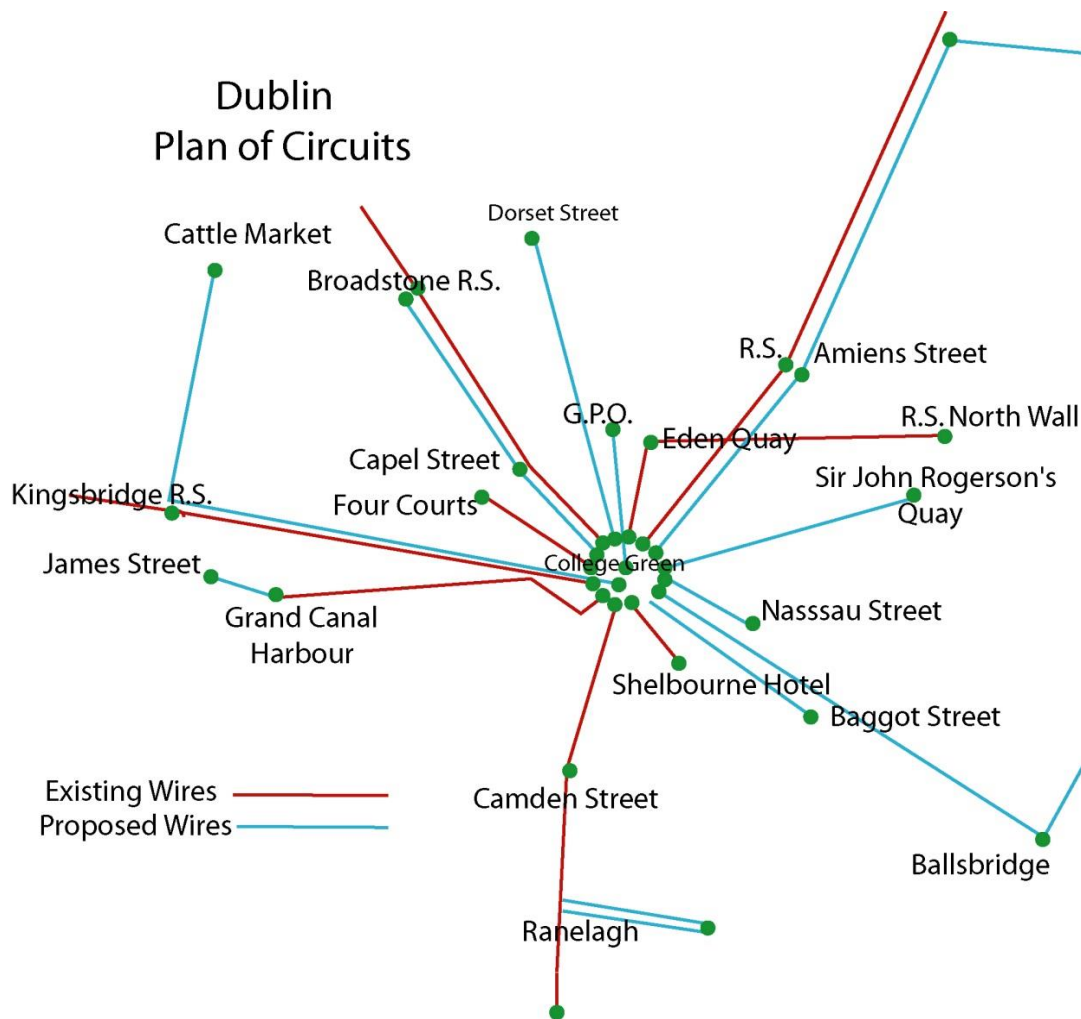
Fig. 4.10 Existing and proposed telegraph lines in Dublin city
Source: *Ireland, reports on circuit arrangements,* pp 45-8.

Dublin as the capital and one of the two major cities, alongside Belfast, on the island was destined to undergo similar infrastructural changes to those that had been witnessed in major British cities. The city's above-ground wires were replaced with underground wiring[52] and to facilitate the rapid distribution of telegrams throughout the city, five pneumatic tube systems were installed.[53] By 1880 there were 2,700 yards of pneumatic tube in Dublin. This was on par with other cities, such as Manchester, 2,026 and Liverpool, 3,021, but was dwarfed by London,

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[52] Sanger's report, in *Report on reorganisation of telegraph system of United Kingdom*, 26.
[53] *Report on telegraph department*, 252.

37,144.[54] These tubes, costing between 12*s.* 8*d.* to 18*s.* per mile, consisted of a lead tube encased in iron for protection. The tubes powered by a stationary engine used a vacuum to transport gutta-percha carriers covered in felt, inside which were placed the messages.[55] It was planned to run three of these tubes from the head telegraph office at College Green to the GPO, Sackville Street; the Four Courts and the Customs House.[56] It was also proposed to open a number of new telegraph offices in the city (fig. 4.10).

Following nationalisation, Dublin was to have the largest telegraphic workforce in Ireland. There were 206 telegraph clerks of various grades employed in Dublin by 1872. Of these 156 were employed in Dublin city, while other fifty were assigned to various tasks throughout the country. By then increased usage of the telegraph system was putting pressure on the Dublin workforce; it was felt that Dublin would require 258 staff in order to operate efficiently.[57] The high cost of staffing the Dublin telegraphic network was to become a recurring abnormality in the years following nationalisation. It was to gain over twenty female staff that had been hired upon nationalisation to work on postal and railway telegraphs. As the railway companies became able to undertake their own work these women were transferred to Dublin.[58] By 1876, 394 telegraph clerks were employed in Dublin; this was 87 more than Edinburgh despite the fact that Edinburgh transmitted more messages (fig. 4.11).

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[54] *Twenty-sixth annual report of the postmaster general, on the Post Office*, 1 [C. 2670], H.C. 1880, xix, 14.
[55] *Report on telegraph department*, 35.
[56] Sanger's report, in *Report on reorganisation of telegraph system of United Kingdom*, 26; Cullen, 'Local government and the management of urban space', p. 198.
[57] Letter, no date, in Transfer of telegraphs, classification of staff., Dublin, 30 Aug. 1872, in Transfer of telegraphs, classification in provincial offices (BT archive, POST 30/224C).
[58] *Report on telegraph department,* 235, 252.

A significant contribution to the high staffing levels in Dublin was the need to man fifteen telegraph offices spread outcross the city.[59] While some offices, such as the G.P.O. and the head telegraph office on College Green, transmitted a lot of telegrams, other uneconomical offices were either politically important, for example the Vice regal Lodge, or important sources of news, for example the Cattle Market (fig. 4.12). The city was also a central telegraph node, responsible for the retransmission of telegrams from a wide hinterland.

The large number of offices was due to a combination of historical agreements from the period of private ownership and the Post Office's desire to provide an extensive service throughout the city. The Grand Canal Harbour which by 1870 was 'in a wretched state' and was 'not a profitable office' is an example of this. The E&I TC had a wayleave agreement allowing it to use the Grand Canal to connect its Dublin telegraph offices to its submarine cable in Wexford. Part of this agreement, which the Post Office inherited, was to operate a telegraph office at the Grand Canal Harbour. In addition, the lack of a central railway station meant that Dublin had a multitude of outlying stations where telegraph offices had to be retained.[60]

[59] Ibid, p. 236.
[60] Report No. 1, Irish division, local system of ; telegraphs for Dublin, 26 May 1870, in *Ireland, reports on circuit arrangements*, pp 4-5; Cullen, 'Local government and the management of urban space', pp 190-3.

Office	London	Edinburgh	Dublin	Belfast	Cork
No. clerks, learners, & c.	1,629	307	394	153	112
No. messages forwarded	2,576,874	257,372	270,291	155,919	103,266
No. messages received	2,412,005	312,567	348,278	220,288	70,422
No. of messages transmitted (i.e. for retransmission)	11,830,320	1,180,800	1,083,458	1,256,200	378,322
Total messages	16,819,199	1,750,739	1,702,027	1,632,407	552,010
No. of circuits in office	529 & 25 tubes	76	74 & 5 tubes	43	49
No. of offices	5	6	15	6	6
Total cost of office	£94,063	£13,202	£19,416	£7,755	£5,307
Annual cost of wages, exclusively employed on news word	9,026	1,137	2,363	1,007	-
Portion of wages not exclusively employed on news work	3,014	411	716	147	900
Cost per message exclusive of news	1.17*d.*	1.59*d.*	2.30*d.*	.96*d*	1.91*d*

Fig. 4.11 Table showing cost of ordinary, non-news related, messages in Dublin, Belfast and Cork, with London and Edinburgh for comparative purposes, 1876
Source: *Report on telegraph department*, 252.

Therefore, Dublin's position as a telecommunication node, historic agreements with various transport companies, the use of staff to cover vacancies and temporary assignments throughout the country, and the accumulation of superfluous workers led to high staffing levels.

	Forwarded		Transmitted		Received		Total	
Office	1872	1875	1872	1875	1872	1875	1872	1875
G.P.O.	894	2,064	5,398	11,990	4,601	2,114	10,893	16,168
Cattle Market	4	11	0	0	1	0	5	11
College Green	1,747	2,087	0	0	2,104	2,970	3,851	5,057
Corn Exchange	26	42	0	0	1	0	27	42
Custom House	106	153	0	0	51	140	157	293
Four Courts	284	351	0	0	271	352	555	703
Grand Canal	27	56	0	0	4	4	31	60
Shelbourne Hotel	68	154	0	0	44	93	112	247
Viceregal Lodge	0	8	0	0	0	1	0	9
Amiens Street railway station (R.S.)	53	113	2	4	15	6	70	123
Broadstone (R.S.)	40	0	0	0	29	0	69	0
Harcourt Street (R.S.)	26	148	0	0	63	237	89	385
Kingsbridge (R.S.)	71	244	38	4	53	180	162	428
North Wall (R.S.)	141	232	0	0	142	200	283	432
Westland Row (R.S.)	64	0	0	0	0	0	64	0
Total	3,551	5,663	5,438	11,998	7,379	6,297	16,368	23,958

(R.S.) Railway station

Fig. 4.12 Volume of telegraphic traffic in Dublin's telegraph offices in 1872 and 1875
Source: *Report on telegraph department*, 262.
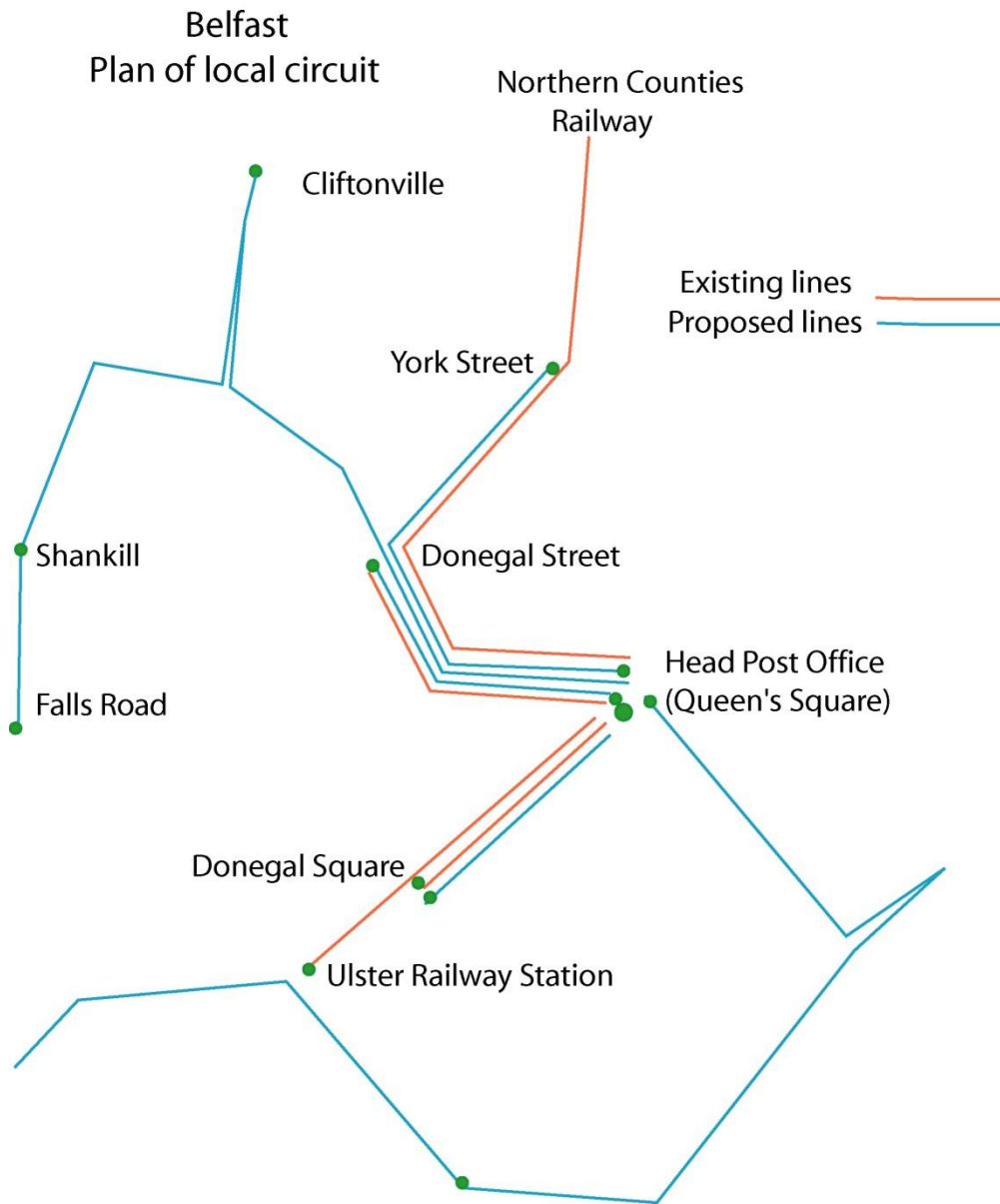
Fig. 4.13 Plan of revised telegraph offices and lines in Belfast, 1870
Source: *Ireland, reports on circuit arrangements*, p. 27.

By 1870, Belfast was the central telegraph node in the north of the island. For example, upon nationalisation large towns such as Derry transmitted telegrams destined for Britain through there. Additional wires were planned to allow more direct communication between north-western towns and Dublin. This meant that Belfast would be responsible for transmitting telegrams for the north-east of the country; in May of 1870 over half of all telegrams transmitted between Ireland and

Britain were relayed through Belfast. Despite plans for the opening of a large number of telegraph offices in the city many of these were never built (fig. 4.13).

A comparison of the volume of telegrams transmitted in the north and south of Ireland demonstrates that while Dublin dealt with slightly more telegrams than Belfast it did so with nearly twice as many telegraph circuits and five pneumatic tubes. Thus, as each circuit had to be manned and maintained, the cost, to the Post Office, of each individual telegram was substantially lower in Belfast. In fact, the operating cost of the Dublin telegraph service, in comparison to other cities in Britain, was quite high. By 1876 Dublin was sending over 1,700,000 telegrams per annum, 14,000 messages fewer than Birmingham yet costing £9,184 more to run. This difference could not be justified on the bases of Dublin's position as a capital city, as Edinburgh's telegraph service, which sent 50,000 more messages, cost just over £7,000 less than Dublin's. In 1876 the cost to the Post Office of transmitting a 1s. message in Dublin was $2^1/_3d$., in comparison to 1.9d. in Cork and 0.9d. in Belfast, which was more in line with the United Kingdom average.[61]

The industrialisation of the north-east of the country,[62] providing more potential customers for each telegraph line, and the central position that Dublin played in the island's telegraphic infrastructure, accentuated these differences. The relative lack of potential customers in the south of Ireland can also been seen in the returns for Cork. It handled under a third of the messages of Belfast yet had the same number of offices (six) and six more circuits (forty-nine) than Belfast. While Cork employed 112 clerks, Belfast the considerably busier office was able to manage with 153. The high transmission to telegraph-circuit ratio that existed in the industrialised

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[61] *Report on telegraph department*, 135.
[62] J.M. Goldstrom, 'The industrialisation of the north-east' in Cullen (ed.), *The formation of the Irish economy*, pp101-12, at p. 101; Cullen, *An economic history of Ireland since 1660*, pp 158-60; Ó Gráda, *Ireland: a new economic history, 1780-1939*, p. 273.

north-east of the country demonstrates that there was much great demand for telegraphy there in comparison to the rest of the island (fig. 4.11).

Revenue and loss in the postal telegraph service

Following nationalisation the revenue of the postal telegraph service across the British Isles increased significantly but it was quickly outpaced by expenditure. Total revenue, including the estimated value of free telegrams provided to government departments, in the year 1870-1 was just over £800,000. This was to increase every year reaching over £3,250,000 by 1898-9. However, by 1883-4 expenditure had overtaken income and from this point onward revenue rarely covered costs, the best financial year being 1888-9 when expenditure came to just under ninety-five percent of revenue. With the addition of interest on stock created for the purchase and upgrade of the telegraphs this meant that the service was, undeniably, loss making.[63]

A number of factors contributed to the poor financial performance of the telegraph service. In the initial years repairs and the expansion of the network were covered by funds allocated to the upgrading works, but by 1873-4 such undertakings began to creep into expenditure. Constant pressure to extend the network saw continued construction of new telegraph lines. The cost of these was to rise to over £240,000 in the year 1898-9, with additional sums, totalling over £75,000, allocated for the purchase and construction of sites and buildings. These extensions alongside those undertaken during the nationalisation process contributed to the high cost of maintenance which was over eighteen percent of revenue by 1898-9.[64]

Another significant contribution to increasing costs was staff. The private companies had maintained their networks with the minimum of staff; for example,

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[63] *Return for each year since purchase of telegraphs of revenue and expenditure of Post Office Telegraphs,* H.C. 1899 (319), li, 2-4 (henceforth *Return of telegraphs revenue and expenditure*).
[64] Ibid, 2-4.

the engineering staff for the whole of Ireland was fifty-four employees: eleven

supervisors, and forty-three linesmen and mechanics.[65] A number of clerks operating

telegraphs during this period were employed either wholly or partly by the railway.

In addition, offices were restricted by the ability to make a profit and were located

mainly on railway lines—construction of telegraph lines alongside the railway being

cheaper (ch. II). This meant that there were only 233 telegraph clerks and 111

messenger boys employed in Ireland prior to nationalisation (appendix 5), a total

workforce of 398—although a significant number of the messenger boys were paid

per delivery and hence were not salaried employees.[66]

Upon nationalisation in 1870 the postal telegraph service in Ireland was

directly employing 339 clerks, with an additional sixty-seven telegraph assistants

being employed by various postmasters. This represented a seventy percent increase

in the number of telegraph clerks on the island. [67] In addition, reconstruction work in

Ireland was only beginning and staff levels upon nationalisation would be under

considerable pressure to operate the upgraded and enlarged system that was planned.

By October 1872 pressure was mounting on the Post Office in Dublin due to its large

workload. This problem was endemic across the telegraph service. With continued

pressure to expand and maintain its network, combined with a price reduction to 6*d*.

per telegram in 1885, the telegraph service was hard pushed to cover its operating

costs never mind pay back the treasury its purchase price as had been originally

envisaged.[68] In Ireland there was a steady increase in the volume of telegrams

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[65] Arrangements for engineering staff from the telegraph companies acquired by the Post Office (BT archive, Post 30/200C).
[66] *Report on reorganisation of telegraph system of United Kingdom*, 703 [C 304], H.C. 1871, xxxvii, 80.
[67] Ibid, 58.
[68] Kieve, *The electric telegraph*, pp 191, 195; Anon, *The Post Office, an historical summary* (London, 1911), p. 70.

transmitted from nationalisation until 1915.[69] This combined with the enlargement of

Ireland's telegraph network led to considerable increases in the service's workforce.

By the year 1879-80 there would be 615 telegraphists and 339 messengers and

porters employed in Ireland. When the wages for these employees were added to the

salaries of various others, such as assistants and medical officers, the total wage bill

for that year was over £65,000. Additional expenses, such as insurance, brought the

total bill for the operation of the telegraph service in Ireland to nearly £68,000.[70]

Figures such as these would have made the private telegraph companies shudder.

Wages were to remain the most significant cost throughout the postal

telegraph service's existence. The wage bill from across the British Isles was to

increase steadily throughout the nineteenth century from a lowly thirty-nine percent

of revenue in the year 1870-1 to over sixty-six percent by 1898-9. The large increase

in the percentage of income needed to cover the wage bill contributed to the inability

of revenue to cover expenses for the last decade of the nineteenth century.[71] A

number of factors influenced the increased percentage of revenue devoted to wages.

These included the integration of the workforce into the civil service which led to a

substantial increase in wages in July 1872.[72] Additionally, the substantial increase in

newspaper intelligence that was a feature of the nationalised telegraph service added

considerably to costs.

The surge in the volume of newspaper intelligence did not have a correlating

growth in revenue due to the favourable transmission rates afforded to the news

industry. For a telegram of 100 words at night, or seventy-five words during the day,

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[69] B. R. Mitchell, *British historical statistics* (Cambridge, New York, 1988), p. 566.
[70] *Civil Service estimates, Post Office telegraphs, 1879-80*, H.C. 1878-9 (0.1-viii), xlix.
[71] *Return of telegraphs revenue and expenditure*, 2-4.
[72] Report from the Surveyor General for Telegraph to the secretary, 7 Sept. 1875, pp 3, 5, in
Telegraphs, acquisition by the state, various reports and papers for 1855 (BT. archive, POST 30/306).

the charge was 1*s.*; importantly the delivery of the telegram to an additional address in the same would cost only 2*d.* (ch. III).

This reduced transmission rate took place in the context of rising literacy in Ireland; by 1911 nearly nine-tenths of the Irish population claimed to be able to read. In line with this rise in literacy was a large growth in newspaper readership, with the numbers of editors and writers employed by newspapers quadrupling between 1861 and 1911.[73] Thus demand for telegraphic 'intelligence' would only intensify following nationalisation, this in turn adding to pressure on staffing levels. Indeed, Dublin was to dedicate a significant proportion of its workforce to the transmission of news intelligence. The city's position as a capital city with a thriving newspaper industry meant that like London the transmission of this information would be a burdensome and large part of the postal telegraph service's duties in the city (fig. 4.11).

Thus, due to substantial increases in uneconomic 'intelligence' for the news industry, improved wages and higher staffing requirements the postal telegraph service was a financial drain on the exchequer. Despite the expectations of Post Office officials, such as F.I. Scudamore, the service was never to repay the substantial sums of money that were expended on its purchase and upgrade (ch. III). While it had at least been able to meet the interest repayments, on its debts, even this was not possible following the introduction of the 6*d.* rate in 1885. The price reduction combined with competition from the telephone was to erode the telegraph network's revenue-making ability.[74] The postal telegraph service at the end of the

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[73] Ó Gráda, *Ireland: a new economic history, 1780-1939*, p. 240.
[74] Anon, *The Post Office*, pp 76-8; J.C. Hemmeon, *The history of the British Post Office* (Cambridge, Harvard, 1912), p. 210.

nineteenth century had cumulative debts of over £7 million from its years of public ownership.[75]

Progress of the telegraphs, 1880s-1912

Despite the difficulties that the Post Office faced in making the service profitable it was nevertheless highly successful from a public service perspective. For Ireland the reduction of transmission rates, from, up to, 4*s.* to 1*s.* upon nationalisation, and to 6*d.* in 1885, had been a boon to Irish telegraph-users as was seen in the increase of telegrams between 1870 and 1912 from approximately half a million to around six million. The reduction to 6*d.* had also greatly benefited the Irish and British provision trades.[76] The expansion of the service had greatly enhanced access, giving areas outside the reach of the railways use of the telegraph for the first time. Given the rise of Irish agricultural and industrial exports, and the increasing rise in imports, the telegraph, particularly the link it provided to Britain, had become an important tool of trade. In addition, given that Irish investments aboard were to grow substantially—estimates put Irish foreign investment in 1914 at *c.* £150 million—[77]access to financial and political information was essential.

While use of the postal telegraph system across the British Isles was to increase so was the cost of its operation. The number of uneconomic offices became a difficulty and the Post Office was forced to introduce a scheme whereby the local community would guarantee the telegraph office. In 1882 this burden was reduced with the guarantee restricted to the annual expenses of the service. In 1891 British rural sanitary authorities were given the power to provide such guarantees and to pay

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[75] *Account of gross amount received and expended on telegraph service, 1897-98,* H.C. 1899 (40), li, 3.
[76] Kieve, *The electric telegraph*, p. 237.
[77] Cullen, *An economic history of Ireland since 1660*, pp 169-70.

for this from local rates; this was extended to Ireland under the Local Government (Ireland) Act, 1898.[78] Finally, in 1906, the guarantee for extensions was reduced to one-third the annual costs.[79] These reductions again demonstrate the Post Office's view of the telegraph as a public service rather than a business. This attitude was in many ways responsible for the massive expansion of the telegraph network in the years following nationalisation. In assessing the cost of telegraph services in Ireland it must also be remembered that the Irish postal system had, in general, been heavy subsidized since its re-amalgamation into the British Post Office in 1831.[80]

The postal telegraph system across the British Isles was to reach a peak in the period 1899-1900 when over 90 million telegrams were transmitted. In the years 1900-7 this figure was to remain virtually stagnant, with a fall in transmission levels experienced from 1907-9. This was mainly due to competition from the telephone for use in local communication (however changes in the manner of compilation of statistics was a contributing factor). There was to be a slight rise in telegram transmissions in 1910, to 87,000,000 but the telephone was to restrict further growth.[81] In Ireland the number of telegrams was to continue to rise throughout this period. Transmission rates were not to peak until 1915 when they reached 6.1 million.[82] This later date for peak usage was probably due to the lack of telephone penetration and telephone trunk-lines in comparison to Britain.

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[78] Local Government (Ireland) Act, 1898, 61 & 62 Vic. Ch. 37.
[79] Anon, *The Post Office*, p. 70.
[80] Duncan Campbell-Smith, *Masters of the Post: The authorized history of the Royal Mail* (London, 2011), p. 259.
[81] Anon, *The Post Office*, pp 70-1.
[82] Mitchell, *British historical statistics*, p. 566.

Conclusion

The nationalisation of the United Kingdom's inland telegraphs was to raise expectations across the British Isles. It was expected that the new postal telegraph service would open offices in areas hitherto denied service, reduce prices, and offer a better level of service to the public, the news industry and merchants. These improvements were directed toward the English core of the United Kingdom, where factors such as urbanisation, industrialisation and population would fund such as service. However, this new standardised service would be made available across the British Isles.

In Ireland nationalisation of the inland telegraphs would lead to a major expansion of the telegraph network's size and reach. The introduction of a 1*s.* charge—reduced in 1885 to 6*d.*—for the transmission of telegrams to any point on the British Isles would be a boon for Ireland. The Post Office would construct additional submarine cables to Britain; expand the geographic reach of the telegraph service, both on the island as a whole and within urban centres; and nearly quadruple the number of telegraph offices on the island. In terms of its success as a public utility, the service vastly improved upon what had been available under the private telegraph companies. Nevertheless, some traditional customers such as Dublin's stockbrokers and businesses in Cork did suffer. The popularity of the service and the substantial delays on cross-island submarine cables led to difficulties.

However, in terms of value for money, Ireland did not have the population, industrialisation or urbanisation to support a telegraph service of the quality, complexity or size of Britain's. The one area that did have these pre-requisites was the north-east of the island. Belfast, the central node for the north-east, transmitted nearly as many telegrams as Dublin with smaller staff levels and half the number of

telegraph lines. Dublin, with much less traffic and considerably more lines, was a lot less productive in absolute terms. It also had a high number of received and forwarded messages which had to be delivered or retransmitted adding to costs (fig. 4.11). The cost of wages in proportion to revenue was therefore much higher in Dublin than Belfast, or for that matter in other cities across the United Kingdom. This is further evidence that Ireland greatly benefitted from the process of nationalisation and from state ownership of the inland telegraphs. This is particularly so as, with the exception of the industrialised north-east, demand for telegraphic communication on the island could not justify the nature and extent of the upgrades and extensions.

In essence the transfer to Ireland of the new 'British' telegraph service standards and the focus of the postal telegraph service on providing an important public utility rather than on profit greatly enhanced Ireland's telegraph network. The fact that most telegraph offices, if not the service as a whole, quickly covered their operational costs is demonstration that the Post Office's policy of pre-empting demand with infrastructure and reducing charges to encourage use was successful and made a major contribution to the popularity of telegraphy as a means of communication in Ireland.

By 1900 the telegraph's role was being challenged by another technology that had been spreading across the United Kingdom: the telephone. However, in Ireland the transmission of telegrams was not to peak until 1915. While the telegraph service in Ireland was to experience competition from the telephone, this was not of the same intensity as Britain due to the lack of telephone trunk-lines. The next chapter shall explore the introduction of this technology to Britain and Ireland, the

development of Irish telephony and seek to understand the role it played, alongside

the telegraph, in providing communication in Ireland.

Chapter V

The Telephone Company of Ireland, 1878-1893

> The telegraphs already, in fine, very much of a discredited old worldish arrangement, and the Telephone asserts instead its new and mysterious superiority. In remains to be seen to what numerous uses in can be applied, and evidently very little time will now be lost in bringing it into play for every purpose of business between country and country, in spite of all obstacles of language or any physical or artificial barrier.
>
> *Irish Times,* 18 July 1882

Introduction

A new technology, developed in the 1870s, was to challenge the electric telegraph's dominance of rapid communication: the telephone. This device invented and developed in the US rapidly spread throughout Britain, from where it was introduced to Ireland. While initially the distribution of the telephone was carried out by small firms, the profit potential, and networked nature of this technology, meant that these were quickly replaced by companies licenced to operate the patent rights of the main telephone inventors. This chapter shall trace the early diffusion of the telephone in Ireland and the establishment and development of the Telephone Company of Ireland (TCI). This was formed in 1882 to promote and supply telephony in Ireland's three southern provinces: Leinster, Connaught and Munster. The northern province of Ulster was to be operated by the National Telephone Company (NTC) which was established in 1881 and was also responsible for parts of northern Britain.

By investigating the early development of Ireland's telephone network, this chapter shall seek to understand the impact that private, as opposed to state, ownership had on the technology's diffusion and use. As well as tracing the initial development of telephony and its arrival in Ireland, it shall seek to understand the factors that influenced the development of the telephone as a networked technology. As technological development is shaped by a wide range of social factors, one

cannot presume that telephony's progress in Ireland took the same shape or trajectory as the rest of the United Kingdom.

Development of the technology

Alexander Graham Bell is credited with inventing the telephone, transmitting the first voice electronically in 1876. Various attempts to transmit sound had been made throughout the 1860s and 1870s, with the telephone initially considered a 'talking telegraph'. Some of these experiments had transmitted sound but could not replicate timbre or amplitude and were, therefore, of no use in the transmission of speech.[1] These early experimental apparatus operated in a similar manner to the telegraph with a membrane connecting and disconnecting a circuit to transmit electrical pulses to a sounder.[2] Such an apparatus had been constructed by a Mr. Yeates of Dublin in the 1860s when he modified an earlier transmitter invented by Philip Reis. Yeates inserted water between the contact-breaker of the transmitter, hence enabling, to an extent, continuous contact. The device was display at the Philosophical Society, Dublin, in 1865, were several words were transmitted and heard.[3] However, these early attempts were not of practical use.

Bell's telephone used a soft-iron diaphragm; this vibrated to soundwaves causing disturbances in the magnetic field of a bar magnet but, crucially, did not break the circuit as early apparatus had done. These disturbances created a fluctuating electric current in the copper wire wrapped around the magnet, which

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[1] J.L. Heilbron, 'Telephone' in *The Oxford companion to the history of modern* science (Oxford, 2003), available at Oxford Reference (http://www.oxfordreference.com) (11 Oct. 2016).
[2] Christopher Beauchamp, 'Who invented the telephone?: Layers, patents, and the judgements of history' in *Technology and Culture*, li, no. 4 (2010), pp 854-78, at p. 858.
[3] W.F. Barrett, 'On the electric telephone' in *The Scientific Proceedings of the Royal Dublin Society*, i (1878), pp 73-82, at p. 76.

was then transmitted to a receiver which transformed it back into soundwaves.[4] Bell's telephone was to be quite useless until the development of the electromagnetic microphone by David Edward (D.E.) Hughes in 1878. This device amplified the weak signals produced by Bell's telephone, allowing for its commercial use.[5] In the United States the telephone was to quickly emerge as a tool of urban business.[6]

The telephone was introduced into the United Kingdom in 1876 but the public was slow to embrace the new technology for a number of reasons. Technological restrictions meant that early telephones could only operate over short distances. In addition, the Post Office—in order to protect telegraph revenue—was to use its monopoly on inland electric communication to restrict the laying of trunk lines between telephone exchanges. Due to these restrictions, the telephone was initially used as a replacement for private telegraphs.[7]

Private telegraph circuits had been installed by various businesses for internal communication between offices, buildings, workshops and so on. The relatively small number of transmissions on such circuits meant that it was not practicable to employ a telegraph clerk. The Wheatstone ABC apparatus, which did not use a code, while slow was ideal for these circuits. The operator would simply press the correct letter on the communicator and crank the handle attached to the 'generator'

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[4] 'Telephone' in *Philip's World Encyclopaedia* (Oxford, 2014), available at Oxford Reference Reference (http://www.oxfordreference.com) (11 Oct. 2016).
[5] R.A. Buchanan, 'Telegraph and telephone services', in Ian McNeil (ed.), *An encyclopaedia of the history of technology* (London, New York, 1990), p. 965
[6] Beauchamp, 'Who invented the telephone?', p. 872; The National Telephone Company, *Reprint of special articles on the telephone service which appeared in 'The Times', Dated 20th, 23th and 24th January, 1899* (London, 1899) (British Library, General Reference Collection, 8761.a.70), p. 3.
[7] See Jeffrey Kieve, *The electric telegraph: a social and economic history* (Newton Abbot, 1973); C.R. Perry, *The Victorian Post Office: the growth of a bureaucracy* (London, 1992); F.G.C. Baldwin, *The history of the telephone in the United Kingdom* (London, 1925); R.J. Feuerstein, 'The early history of the telephone in England 1877-1911' (D.Phil. thesis, University of Sussex, 1989), pp 16, 75.

—creating positive and negative currents—to transmit the letter. This was then received by another Wheatstone ABC which pointed a needle to the correct letter on an 'indicator' (fig. 5.1).

Fig. 5.1 Wheatstone ABC apparatus, with integrated generator, communicator and indictor, 1858 ©
Science Museum, London/ Science & Society Picture Library.
Source: Wheatstone's portable ABC telegraph, 1858, available at Science Museum
(http://www.sciencemuseum.org.uk/images/i042/10310078.aspx) (23 April 2015).

The introduction of telephone exchanges also contributed to the appeal of the telephone: they allowed for conversations using any 'telephone stations'[8] connected to the exchange.[9] As early as 1864 the Universal Private Telegraph Company had established an exchange in Newcastle-on-Tyne to connect private telegraph circuits.[10] Following the nationalisation of the operations of this company, along with the rest of the inland telegraph companies in 1870, the Post Office extended this

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[8] 'Telephone station' was interchangeable with telephone apparatus in the early literature describing the technology.
[9] An exchange was an exterior communication node which allowed for the interconnection of individual telephones.
[10] Feuerstein, 'The early history of the telephone in England 1877-1911', p. 86.

system to several cities.[11] By 1880 this included Newcastle-on-Tyne, Hull, Middlesbrough and Stockton.[12]

The telephone was much easier to use and provided more rapid communication than the Wheatstone ABC apparatus, which it quickly began to replace. Thus, the telephone not only supplanted the private telegraph but also surpassed it in terms of utility. Irish cities did not have a significant number of private telegraph wires, with only thirty-one private renters in 1872.[13] Thus, as the primary customers for these early telephones were those who had switched from ABC telegraphs, the technology was deigned this early foothold on the island.

Bell's telephone was introduced to the United Kingdom in 1876 when William Thomson, the future Lord Kelvin, demonstrated it at a meeting of the British Association.[14] The following year Bell was in Britain attempting to sell his device to the Post Office. The Post Office's chief engineers, William Preece and Henry Fischer, had viewed the telephone whilst in America in 1877. They were impressed by the device and Bell, always alert to a business opportunity, had presented them with a pair of telephones.[15] The following year, 1878, the Post Office sought Treasury sanction to hire telephones out to those customers who had private telegraph apparatus.[16] In the same year the newly-invented telephone was being displayed in Ireland.[17]

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[11] *Report from the Select Committee on the telephone service; together with the proceedings of the committee, minutes of evidence, appendix and index 1894*, H.C. 1895 (350), xiii, 1 (henceforth cited as *Report on telephone service*).
[12] *Irish Times*, 22 Dec. 1880; Extract from the *Electrician*, 25 Dec. 1880, in Baldwin, *The history of the telephone in the United Kingdom*, pp 48–9.
[13] Thomas Wall, 'Some notes towards a history of telecommunications with particular reference to Ireland' Unpublished paper, 2005 (NLI, call no. 5B 180).
[14] Perry, *The Victorian Post Office*, p. 145.
[15] *Report on telephone service*, 1.
[16] A.J. Litton, 'The growth and development of the Irish telephone system' in *Journal of the Statistical and Social Inquiry Society of Ireland*, session 115 (1961), pp 79-115, p. 79.
[17] *Irish Times*, 7 Dec. 1877.

From its invention the feasibility of submarine communication by telephone was being investigated. The *Irish Times* carried an article in December 1877 which claimed that 'a number of experiments of a private nature were made between Dublin and Holyhead, a distance of 47 mile, through a marine cable embracing seven wires.'[18] As the only (telegraph) cables available were those belonging to the Post Office these early experiments demonstrate its interest in this new technology. One of the central arguments against the feasibility of the telephone replacing the telegraph was the restricted distances over which it could operate. Such experiments were of real significance; if the technology was able to transmit over long-distances, particularly via submarine cables, it would mean that the telephone could become a serious rival to the well-established, and state-owned, telegraph.

After a six-month delay the Treasury approved Preece's 1878 application for the Post Office to hire out telephones. However, in the same year, The Telephone Company was formed to operate Bell's patent. This company opened the first British telephone exchange in August 1879, connecting seven or eight subscribers in the city of London.[19] This effectively established the company as a rival to any potential Post Office telephone service.

In 1879 a challenger to the Bell telephone emerged when a telephone designed by Thomas Edison was brought to Britain and demonstrated in London by Professor William Fletcher (W.F.) Barrett, of Dublin's College of Science. In the same year the Edison Telephone Company of London was formed with a capital of £100,000.[20] The introduction of the Edison telephone, with separate patents, brought significant challenges for the (Bell) Telephone Company. Up until this point, due to its patents, it had been the only company in the United Kingdom able to offer

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[18] *Irish Times*, 22 Dec. 1877.
[19] Feuerstein, 'The early history of the telephone in England 1877, p. 64.
[20] Litton, 'The growth and development of the Irish telephone system', p. 80.

telephonic communication. Indeed the company was very protective of the rights provided by its patents, this being essential for attracting capital investment.[21]

Following the decision of the Post Office to pursue a monopoly over telephonic communication in May 1880 both companies merged to form the United Telephone Company (UTC).[22] In December 1880 the courts ruled that the *telephone* was to be considered a *telegraph* under the criteria of the 1868 Electric Telegraph Act. This gave that the postmaster general a monopoly over all *telephonic* as well as *telegraphic* communication within the United Kingdom. Henceforth, even if the Post Office allowed the private telephone companies to continue to transmit they would 'be compelled to pay tribute to the State' which was fixed at ten percent of their revenue. With the Post Office's monopoly secured it decided to establish telephone exchanges 'in order to meet the convenience of the public'.[23] The UTC's enraged directors stated that while the court's ruling 'may be technically right, [it] was pretty universally condemned … as being very questionable on the grounds of morality and expediency.'[24]

For the Post Office the opening of telephone exchanges was a natural continuation and expansion of its private telegraph business. Renting a Post Office telephone would cost £14 10*s.* within half a mile, and £18 within one mile, of the telephone exchange, with proportionate charges for distances exceeding this. Users

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[21] Stathis Arapostathis and Graeme Gooday, *Patently Contestable: electrical technologies and inventor identities on trial in Britain* (Cambridge, MA., 2013), pp 89, 90-1, 94.

[22] 'Telephone' in Daniel Chandler and Rod Munday, *A dictionary of media and communication* (Oxford, 2011), available at Oxford Reference (http://www.oxfordreference.com) (11 Oct. 2016); Litton, 'The growth and development of the Irish telephone system', p. 80; Roddy Flynn, 'The development of universal telephone service in Ireland 1880-1993' (Ph.D. thesis, School of Communications, DCU, 1998), p. 101; *Irish Times*, 10 July 1880.

[23] *Irish Times,* 21 Dec. 1880; Anon, *The Post Office, an historical summary* (London, 1911), p. 90, Arapostathis and Gooday, *Patently Contestable,* 92-94; for more detail on the early relationship between the Post Office and the telephone see: Feuerstein, 'The early history of the telephone in England 1877-1911', pp 101-28.

[24] Extract of United Telephone Company's director's report for the year ending 30 April 1881, in Baldwin, *The history of the telephone in the United Kingdom*, pp 46–7.

of the postal telephone system could also 'send messages by wire to the telegraph office to be thence transmitted at the ordinary charge to other towns.' In addition, the Post Office was 'ready to make arrangements for the establishment or continuance of systems of intercommunication by existing private companies.'[25]

The Post Office's offer to provide telephonic communication led to direct confrontation with the United Telephone Company which quickly published its response in national newspapers. This stated that the 'patent rights in this country of Professor Grahame Bell and Mr Thomas Alva Edison are the exclusive property of the United Telephone Company (Limited)'. The advertisement was also quick to threaten legal action against anybody who used 'any form of carbon transmitter, or any form of magneto or electro chemical receiver' which it had not authorised, even if this was supplied by the Post Office.[26] The Post Office had overcome its patent difficulties by purchasing telephones from the Gower Bell Company, which had been licenced to sell telephones in the United Kingdom.[27]

This opposition—and the inability of the Post Office to secure a sufficient number of Gower-Bell telephones—combined with memories of the financially disastrous inland telegraph nationalisation, 1870, meant that the Treasury was reluctant to sanction serious expenditure on a postal telephone system. Added to this a carefully orchestrated press campaign was initiated by the UTC, which sought to remove Post Office restrictions on its activities. Edmund (E.D.) Gray, owner of the *Freeman's Journal*, M.P. for County Carlow and a future chairman of the Telephone Company of Ireland (TCI), contributed to this campaign by raising the telephone companies' concerns in parliament. He argued that the Post Office's restrictions

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[25] *Irish Times*, 21, 22 Dec. 1880.
[26] *Irish Times*, 23 Dec. 1880.
[27] Baldwin, *The history of the telephone in the United Kingdom*, p. 29.

were not only harming the profitability of the telephone companies but also hindering the development of an important service for the public.[28]

The call for a free-market approach to telephone development suited the *laissez-faire* thinking of the postmaster general, Henry Fawcett, who liberalised the telephone licence system in 1882.[29] The Post Office had previously refused to issue new licences. This had the dual effect of ensuring that new companies were not formed and restricted the activities of existing ones to named urban areas. However, the issuing of 'Fawcett Licences' reversed this policy, allowing existing companies to operate across the whole of the United Kingdom.[30] The new licences would expire on 31 December 1911, with the option of state purchase in 1890, 1897 and 1904.[31]

The telephone in Ireland

In 1879, the same year that Britain's first telephone exchange was opened in London, Bell telephones appeared for sale in Dublin and Belfast.[32] Its promotors were quick to display this astonishing new technology to the public. Maguire and Son, of Dublin, fitted a telephone system between their premises on Dawson Street and the Gresham Hotel, Sackville Street. On 4 February 1878, the *Irish Times* was able to report that 'one of our representatives had the pleasure of conversing' between these locations. Such exhibitions not only generated publicity but locations such as the Gresham Hotel attracted just the kind of wealthy individuals who would be interested in the practical applications of the telephone. In the same year telephones were being installed in premises across Dublin. For example, the Midland

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[28] Feuerstein, 'The early history of the telephone in England 1877-1911', p. 125.
[29] Duncan Campbell-Smith, *Masters of the Post: The authorized history of the Royal Mail* (London, 2011), p. 193.
[30] J.C. Hemmeon, *The history of the British Post Office* (Cambridge, Harvard, 1912), p. 222.
[31] The National Telephone Company, *Reprint of special articles on the telephone service*, p. 6.
[32] *Irish Times*, 19, 24 Jan., 4 Feb. 1878.

Great Western Railway installed a telephone line between the chairman's and manager's offices, at Broadstone station Dublin. This is demonstration that this new technology was viewed not only as marvel of science and engineering, but also as a practical tool of business.[33]

By September 1879, the Edison Telephone Company of London was proposing to establish a telephone exchange in Dublin.[34] However, it would be the (Bell) Telephone Company which would open Dublin's first exchange in March 1880. At this point the Dublin company was owned and managed from London.[35] In addition to the exchange, located at 8 Grafton Street Dublin, the company also offered to erect 'private lines between residences, offices, mills, mansions, stables &c, &c'. The company's had a variety of customers, including railways, theatres and fabric manufacturers. The *Freeman's Journal* was also an early convert, installing a number of telephones in 1880;[36] it was followed by the *Irish Times* in 1882.[37]

The company's decision to locate its office at the Commercial Buildings, Dame Street, Dublin, highlights the type of business and financial customers attracted to this new technology. The Commercial Buildings, an important financial institution, was opened in 1799. It was a centre for wholesale merchant transactions and was located close to two other important financial buildings: the Royal Exchange, Dame Street, and the Bank of Ireland, College Green.[38] Thus, from this location the telephone company would attempt to attract the city's financiers and

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[33] Wall, 'Some notes towards a history of telecommunications', p. 63; *Irish Times*, 4 Feb. 1878.
[34] *Irish Times*, 15 Sept. 1879.
[35] *Irish Times*, 2 Apr. 1880.; Peter Collins, 'Telephone', in S. J. Connolly (ed.) *The Oxford Companion to Irish History* (Oxford, 2002), p. 255; Litton, 'The growth and development of the Irish telephone system'; List of exchange subscribers issued by the United Telephone Company 1880 (B.T. archive, TPC 1/1), also referenced as United Telephone Company, list of subscribers (BT archive, POST 84/136), in Francis F. Cullen, 'Local government and the management of urban space: a comparative study of Belfast and Dublin, 1830-1922' (Ph.D. thesis, Department of History, NUI Maynooth, 2005), p. 212.
[36] *Irish Times*, 20 Feb. 1880; Wall, 'Some notes towards a history of telecommunications', pp 62-4.
[37] Cullen, 'Local government and the management of urban space', p. 219.
[38] Frank Cullen, *Dublin 1847: city of the ordnance survey* (Dublin, 2015), p. 75.

merchants. These were the types of business people who had made the telephone a success in other countries.[39]

By 1880 the newly formed UTC's Dublin exchange had thirty-two telephone subscribers. Most of these belonged to either the company or its shareholders—such as E.D. Gray, and his *Freeman's Journal* newspaper, and alderman Valentine Blake (V.B.) Dillon[40], both of whom would later become directors of the Telephone Company of Ireland. The UTC was anxious to expand its network and in August 1880 offered Dublin Corporation a twenty-five percent reduction in the price of telephone rental in exchange for 'permission to carry their wires over the houses and streets of the city'.[41] Such a wayleave would remove a significant barrier to the company's expansion, allowing it to erect wires on an ad-hoc basis rather than seeking permission from the corporation for each line.

Negotiations with Dublin Corporation were still ongoing in November 1880. It's Paving, Cleansing and Lighting Committee had recommended granting permission but on the request of Mr. Brooke, M.P., it was decided to delay approval until a decision on whether the right to lay wires was to be granted in perpetuity.[42] While permission was eventually given, the episode highlights the impact that non-users could have on the development of networked systems such as the telephone.[43]

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[39] Angel Calvo, 'The shaping of urban telephone networks in Europe, 1877-1926' in *Urban History*, xxxiii, no. 3 (2006), pp 411-34, at pp 414, 429.

[40] This is spelt Dillion in some sources.

[41] *Irish Times*, 24 Aug. 1880; Report of the General Purposes Committee recommending that permission be given to the Telephone Company to carry their wires over the city, in RPDCD, vol. 1, 1881, p. 101 (DCLA), and UTC list of subscribers 1880, in Cullen, 'Local government and the management of urban space', pp 201-8.

[42] *Irish Times*, 9 Nov. 1880.

[43] Cullen, 'Local government and the management of urban space', pp 215-8; for an in-depth study of the impact of users and non-users in the shaping of early telephone networks see M.A. Kay, 'Inventing telephone usage: debating ownership, entitlement and purpose in early British telephony' (Ph.D. thesis, School of Philosophy, Religion and History of Science, University of Leeds, 2014); see also Baldwin, *The history of the telephone in the United Kingdom*, pp 151–2.

The UTC was quick to offer its services throughout the south of Ireland. While the establishment of telephone exchanges was sluggish, businesses throughout the country adopted the new technology. In Drogheda, Messrs Benjamin Whitworth Brothers had telephones installed between their mills in December 1880. The *Irish Times* reported that 'this speedy and efficient means of communication will in all probability be followed by other firms in Drogheda, and it is believed a telephonic centre [exchange] will soon be established there.'[44] Thus, firms would install telephones for internal communication but once the number of such company's reached a certain point it became financially viable to install an exchange.

Drogheda's mercantile and industrial base meant that the town was well suited for the development of telephony. At the beginning of the nineteenth century it was one of the most important textile producing towns outside of Ulster and by 1881 it had a population of 14,622. As well as a number of municipal buildings, the importance of linen production was recognised in the built landscape by the inclusion of a linen hall. However, by the later part of the nineteenth century, linen had given way to cotton and flax production which were 'carried out to a great extent.' By 1882, the town had a large, water-powered, cotton factory, and three flax mills which employed approximately 1,000 people. The Grendon & Co. iron works employed around 300 people in the construction of steam engines, boilers and iron bridges. The town also contained six corn-mills, five salt works, two breweries, eight tanneries, four soap works and a brewery which focused on export. The town, located on the Dublin to Belfast railway line and using the river Boyne for transport,

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[44] *Irish Times*, 18 Dec. 1880.

carried out considerable trade with Liverpool, focusing on textile and agricultural exports.[45]

The early development of telephony in Ulster

In Ulster the diffusion of telephony was to proceed in a similar manner to the rest of Ireland, by May 1880 the Scottish Telephone Exchange Company had offices in Belfast.[46] It had also obtained rights to erect wires, not to exceed five miles, from Belfast to Holywood. The company installed a fifty-line exchange at 2 Castle Chambers, installing a demonstration line and offering free service for three months to fifty firms. Competition was introduced a few months later with the founding of an exchange by the UTC. However, the two systems had no interconnectivity, which was a serious drawback for subscribers.[47]

In 1881 the UTC decided that it would concentrate on the development of its network in London and form subsidiaries to run telephone operations throughout the United Kingdom. These would pay the UTC for the use of its telephone patents and negotiate with the Post Office for a licence to transmit.[48] The National Telephone Company (NTC), established on 10 March 1881, was to assume responsibility for the development of the telephone in Yorkshire, Nottingham, the whole of Scotland and the whole of Ulster. In Belfast the company took over the operations of the UTC, placing it in competition with the Scottish Telephone Exchange Company. The NTC eventually bought out this company and the two exchanges were merged, at 3

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[45]E.R.R. Green, 'Industrial decline in the nineteenth century' in L.M. Cullen (ed.), *The formation of the Irish economy* (Cork, 1976), pp 89-100, at p. 94; *Thom's official directory for Great Britain and Ireland for the year 1882* (Dublin, 1882), pp 1206-7.

[46] Baldwin notes that an exchange was opened in Belfast by 26 April 1880, source: Baldwin, *The history of the telephone in the United Kingdom*, p. 29.

[47] *Irish Times*, 16 July 1880; Wall, 'Some notes towards a history of telecommunications', p. 66; Baldwin, *The history of the telephone in the United Kingdom*, pp 108, 136.

[48] *Report on telephone service*, 3.

High Street, Belfast, in 1890.[49] The telephone provided obvious advantages to

business and companies in Belfast, for example Harland and Wolff, with its large

shipbuilding yard, had installed telephones by 1883.[50] In addition to the exchange in

Belfast, by 1882 the NTC also had a telephone exchange in Bangor; however, this

did not have the same success as the Belfast exchange in attracting subscribers (fig.

5.2).

Towns	Number of Exchange Subscribers at		
	31 Dec. 1882	30 Nov. 1883	30 April 1884
Belfast	161	224	247
Bangor	5	5	5

Fig. 5.2 Subscribers to the National Telephone Company in Ulster, 1882-4
Source: Statement prepared from the records of the receiver and accountant general's office showing
the number of exchange subscribers in the towns licensed to the National Telephone Company at the
undermentioned dates, in Telephone Policy Papers (BT archive, TCB 304/1).

Electricity on display in Ireland

As Iwan Morus has demonstrated, there was much popular interest in electricity—in

nineteenth-century England—and it became a 'symbol of Victorian progress.'[51]

Morus's research concentrates on the first half of the century, when displays of

electricity was primarily performed by instruments designed for that purpose.[52]

However, technologies such as the telegraph and telephone proved useful tools with

which to visually explore and marvel at this strange 'fluid'. These technological

displays, which were part showmanship and part educational, were driven by patrons

who sought elucidation on the role that electricity and machines were playing in the

transformation of society.[53]

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[49] Baldwin, *The history of the telephone in the United Kingdom*, p. 145.
[50] Anon, 'Harland and Wolf' in *The New Monthly Magazine*, cxxii, no. 729 (1883), p. 386.
[51] I.R. Morus, *Frankenstein's children: electricity, exhibition, and experiment in early-nineteenth-century London* (Princeton, 1998), p. 3.
[52] I.R. Morus, 'Currents from the underworld: electricity and the technology of display in early Victorian England', in *Isis*, lxxxiv, no. 1 (1993), pp 50–69, at p. 54.
[53] Morus, *Frankenstein's children*, p. 155.

In turn the organisers of such displays had many motivations ranging from immediate financial gain, in the form of gate receipts, to more long-term objectives, such as proving the reliability of these technologies. Thus, exhibitions were often used to promote a new technology through the display of its usefulness, ingenuity and reliability. While the large industrial exhibitions of the mid-nineteenth century, including those in Cork, 1852, and Dublin, 1853, could be viewed as the culmination of these popular experiments, smaller-scale public exhibitions and lectures on electricity were to remain popular in Ireland into the late-nineteenth century. Indeed, unlike Britain, the state was to encourage and support scientific lectures in the Irish provinces. Of great importance for this study was the national system of science instruction carried on by scientific and literary societies. These societies were aided by lecturers, initially provided by the Royal Dublin Society (RDS) and then jointly with the Department of Science and Art following its establishment in 1853, who travelled the country providing public lectures, until the scheme was disbanded in 1866. Despite this such lectures were to remain popular in Ireland throughout the nineteenth century. As provincial societies were reliant on revenue from attendees to cover their contribution to such displays, entertainment as well as education was a priority.[54]

The arrival of the telephone provided these exhibitors with an additional implement with which to awe their audience with the wonder that was electricity. The telephone was to feature prominently in many Irish technological and scientific exhibitions. In Britain, Bell himself was to embark on a series of public lectures following his arrival, 1877.[55] In March 1879 the Royal Dublin Society (R.D.S.) hosted a lecture by Professor W.F. Barrett (of the College of Science, Dublin) that

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[54] Enda Leaney, 'Missionaries of science: provincial lectures in nineteenth-century Ireland' in *IHS,* xxxiv, no. 135 (2005), pp 266-89, at pp 267-8, 270-2, 275-7, 282, 285.
[55] Feuerstein, 'The early history of the telephone in England 1877-1911', pp 39-40

was concerned with newly-developed telephones, including that of Edison. The telephone was on display at a viceregal garden party in August 1878. At a more popular level during the same year the Rotunda's exhibition room, Dublin, was to hold 'a most interesting and instructive modern entertainment, by J. R. Chislett, of London'; among the objects on display was the telephone. These exhibitions were to continue throughout the telephone's infancy with displays of 'electric domestic apparatus, telegraphy, and the telephone' taking place daily at the Cork Exhibition of 1883.[56] Accordingly, the modern marvel of the telephone was to prove a powerful attraction to those seeking to use electricity for entertainment.

The telephone was on display at the British Association meeting (Plymouth) of August 1877. A lecture on the topic by William Preece attracted a large crowd and was deemed to be 'the most interesting part of the business'.[57] William Thomson (later Lord Kelvin) read a letter which noted the arrival of Bell at Glasgow. There Bell demonstrated his telephone at use through a replicated 100 miles of Atlantic cable and the 'equivalent of between 2,000 and 3,000 miles of land-line'.[58] Both of these experiments, in addition to Bell's subsequent attendance at the British Association meeting, allowed him to promote his interests by demonstrating the telephone's practicality. [59] This was done not by an appeal to commercialism but rather by expounding his invention as a scientific and technological breakthrough. So impressed was William Thomson that he described the telephone as 'the most wonderful invention of the age.'[60]

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[56] *Irish Times*, 6 Apr., 16 Aug. 1878, 10 Mar. 1879, 25 June 1883.

[57] Feuerstein, 'The early history of the telephone in England 1877, p. 34; *Belfast Newsletter*, 18 Aug. 1877.

[58] *Belfast Newsletter*, 18, 20 Aug. 1877. This was done using a gas filled tube to replicate the conditions of the aforementioned cables.

[59] 'British Association' in *The Athenaeum*, no. 2601 (1877), p. 272.

[60] *Belfast Newsletter*, 18 Aug. 1877.

Raymond Feuerstein has highlighted that Bell's efforts to promote his telephone did not focus solely on learned societies but also provided exhibitions to the public. Feuerstein highlights one demonstration which connected two mines seventeen miles apart.[61] The ability of the telephone to connect the mine shaft, undoubtedly a dangerous work environment, to the surface could not have been lost on mine owners. Thus, such demonstrations were an important part of Bell's efforts to create a market for his invention.

Accordingly, while Bell exhibited and lectured on the telephone, he was also careful to outline the uses to which the device had been put to in the US, combining science and commerce. In doing so, he was able to maintain the aura of being a gentleman of science rather than a businessman. To do this experimenters and promotors of new technologies had to self-fashion themselves to meet the expectations of their audience and, thus, the relationship between social status and accomplishments was often intertwined.[62]

Belfast was to witness a number of such exhibitions during the 1870s and 1880s. Prominent amongst those displaying the technology was John (J.H.) Greenhill.[63] Greenhill held a B.Mus. from Trinity College, Dublin, and was interested in electricity, winning a certificate at the Cork Industrial Exhibition, 1883, for manufacturing a Crompton-Burgin dynamo.[64] His displays of the telephone provided the audience with an insight into a device that was 'creating so much

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[61] Feuerstein, 'The early history of the telephone in England 1877-1911', p. 41.
[62] Morus, *Frankenstein's children*, xi; For an in-depth study of the relationship between fashioning technology and self, see Ben Marsden and Crosbie Smith, *Engineering Empires* (Basingstoke, New York, 2005).
[63] J. H. Greenhill, 'Abstract of paper on Professor Graham Bell's telephone' in *Report and Proceedings of the Belfast Natural History and Philosophical Society*, Session 1877-8 (1878), pp 83-5.
[64] *Cork industrial exhibition, 1883: Report of executive committee, awards of jurors and statement of accounts* (Cork, 1886) p. 365, available at Cork Past and Present (www.corkpastandpresent.ie) (4 Mar. 2015).

discussion in the scientific world.'[65] Thus, as science is a cultural practice, the audience could gain an insight into these broader discussions and try to find a place in, and understanding of, this world. [66]

However, Greenhill's demonstrations had motivations beyond the scientific enlightenment of his audience. His telephones were supplied by Colonel William Reynolds, Bell's representative in the United Kingdom, who had a vested interest in not only promoting the telephone but in promoting Bell's telephone. Thus, Greenhill's displays were tying the worlds of science and commerce together. Greenhill was to lecture on Bell's telephone at a number of institutions—such as the Natural History and Philosophical Society, at the Belfast Museum. He was quick to warn the audience against using unpatented non-Bell telephones, thus reinforcing the perception of Bell's telephone as the telephone.[67]

These sophisticated promotional tactics were necessary due to the simple design of the telephone. Once aware of its basic construction it was easily reproduced, for example W.F. Barrett had displayed such a telephone in January 1878. Due to this Bell promoted his device by not only emphasising its patent but also its reliability and highlighting experiments that proved its dependability. In 1878, Greenhill was quick to point out that the latest Bell 'box' telephone had successfully communicated between Dublin and Holyhead, thereby demonstrating its technological superiority. While admitting that other telephones had been invented, Greenhill insisted that 'the telephone, *par excellence,* was Bell's [emphasis in the original]'.[68]

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[65] *Belfast Newsletter*, 18 Aug. 1877.
[66] Morus, *Frankenstein's children*, ix.
[67] *Belfast Newsletter*, 20 Dec. 1877.
[68] *Belfast Newsletter*, 3, 9, 29 Jan. 1878.

For the public, the telephone was a new and exciting technology that could be put to a multitude of uses and change how society operated:

> What opportunities of intercourse will not the immediate future bring to lovers, conspirators, and men of business!
> A score of private drawing-rooms may join at a concert of the first singers of the world; the popular preacher may preach to his study walls and electrify as many congregations as will hitch themselves on to his wire; the college lecturer may stand with his back to his own fire place and instruct the young idea wherever it is gathered.[69]

The possibilities that the telephone presented were rapidly grasped and its position as the fastest method of communication was quickly established in the mind of the public. Though the electrical current that transmitted speech operated at the same speed as the telegraph, the point to point nature of the technology meant that users were in near instantaneous contact. Owners of ships and horses desiring to emphasise the speed of their charges quickly adopted the name of what had become the fastest means of communication: *telephone*. On 25 February 1878 a new Irish steamer was christened 'telephone' and in the same year a horse named 'telephone' was racing at the Curragh.[70] By using this name, the owner(s) not only demonstrated that they understood its implications, in terms of perceptions of speed, but more importantly that the race-going public and ship-using merchants would also make that connection. This demonstrates how early in its development the telephone gripped the public's imagination. In addition, as the epigraph to this chapter highlights, the telephone was tied strongly to ideas of progress and modernity.

The Telephone Company of Ireland

On 26 June 1882 the UTC announced the launch of the Telephone Company of Ireland (TCI), it having been formed on 27 May 1882. The company would use the

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[69] Anon, 'Telephony (an account of progress of Thomas A. Edison's invention)', in *The University Magazine*, iii (June, 1879), pp 650-653, at p. 653.
[70] *Irish Times*, 20, 25 Apr. 1878.

UTC's licence to provide exchange telephony in Dublin and assumed control of telephone provision in the provinces of Leinster, Munster and Connaught—with the NTC being responsible for Ulster. The formation of regional companies, such as the TCI, was in response to the UTC's realisation of the importance of local notables in encouraging subscribers from industrial, mercantile and financial sectors and securing wayleaves for its wires.[71]

By 1882, the Dublin telephone exchange had expanded to include 166 subscribers; these, as was the case in the rest of the British Isles, were mostly legal professionals and merchants. The TCI estimated it would raise £200,000 in capital, divided into 25,000 preference and 175,000 ordinary shares of £1 each. In an arrangement similar to its agreements with other provincial companies, the UTC would accept its patent rights payments in ordinary shares and an annual royalty of £2 for each set of instruments.[72] The company stated that this was 'a test of the confidence which may be reposed in this company' and was likely a tactic to encourage investors by reducing the expenditure of the TCI.[73]

The company's need to encourage investors was understandable given the reluctance of Irish financiers to fund local industry and infrastructural projects. While there were substantial sums of money deposited in Irish banks and Irish residents were actively investing capital in various projects, there was little confidence on their part in Irish investments. However, once such projects aroused the interest of British financiers, Irish investors quickly became interested. Also affecting the capitalisation difficulties of Irish enterprise was the fact that Irish banks channelled most of the money they held on deposit out of the country; this was particularly true of the 1870-80s when the TCI was attempting to attract

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[71] Baldwin, *The history of the telephone in the United Kingdom*, pp 135-7.
[72] Cullen, 'Local government and the management of urban space', pp 218-9.
[73] *Irish Times*, 26 June 1882.

investment.[74] Hence, this ingrained conservatism to invest capital in Ireland had the potential to hamper the TCI.

As well as the cautiousness of Irish investors, the sums on deposit in Irish banks were reduced from a figure of £33 million in 1876 to £28 million by 1881. Due to industrial and agricultural difficulties during the 1880s, savings did not reach 1876 levels again until 1890.[75] Hence, the prospects of the TCI were not as bright as they first appeared. The company, promoting a revolutionary but relatively untested communication technology, would be reliant on local investment in a country with a traditionally conservative outlook in a period of economic depression.

Despite traditional conservatism amongst investors, interest in the company appeared high: the application list for shares was closed, on the 30 June, after only four days.[76] The UTC would continue to have an interest in Ireland's telephonic affairs, due to its shareholding, and would send a representative to the TCI's general meetings. In return, the TCI would rely upon the UTC in Britain to support the interests of the telephone companies, particularly against the Post Office's initial refusal to extend areas of operation.[77]

As the telephone was a networked system it was natural for the first exchanges in Ireland to open in the larger cities. The telephone was an, expensive, tool of commerce which meant that only large urban areas with sufficient numbers of people, merchants and industrialists would ensure its profitable operation. In a European context, cities with large financial and commercial sectors experienced more growth in telephone use and provision. Dublin, with its large population, was a

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[74] Joseph Lee, 'The provision of capital for early Irish railways, 1830-53' in *IHS*, xvi (1968-9), pp 33-63, at pp 62-3; Joseph Lee, 'Capital in the Irish economy' in L.M. Cullen (ed.), *The formation of the Irish economy* (Cork, 1976), pp 53-63, at pp 53–5, 60; L.M. Cullen, *An economic history of Ireland since 1660* (2nd ed., London, 1987), pp 168–9.
[75] Cullen, *An economic history of Ireland since 1660*, p. 150.
[76] *Irish Times*, 1 July 1882.
[77] Report of ordinary meeting of the Telephone Company of Ireland, in *Irish Times*, 18 Oct. 1884.

candidate for a networked telephone system but its lack of an industrial base in comparison to other UK cities was to have an impact on the density and extent of the network.[78]

By June 1882 Dublin Corporation was actively considering the installation of telephones to connect its premises, including fire brigade stations, to the central telephone exchange.[79] The UTC, encouraged by Bell, had advertised the telephone not only to businesses but also 'police offices, fire stations, hospitals, railways, retailers, water companies and newspaper offices.'[80] The UTC (whose activities had now been taken over by the TCI) had tendered 'for erecting and maintaining communications between the several departments of the [Dublin] corporation, including the maintenance of communication, both day and night, with all Fire Brigade stations' and these were accepted by the corporation in September of that year.[81]

Other institutions in Dublin, such as the South Dublin Union, also saw the benefits of adopting the telephone. For the sum of £12 per annum the Union would be connected to the police, fire brigade and various parts of the city.'[82] This sum compared favourably with the £20 per annum charge in London, Manchester, Liverpool and Glasgow.[83] Captain Boyd of the Board of Guardians felt that the introduction of the telephone would reduce the use, and cost, of cars by the union's master and officers. In his opinion '£12 per annum was a mere bagatelle for such a convenience as the telephone would be.' The board's approval of the telephone demonstrates that the connection of services, such as the police and fire brigade,

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[78] Calvo, 'The shaping of urban telephone networks in Europe, 1877-1926', pp 414, 429.
[79] *Irish Times*, 2 June 1882.
[80] Kay, 'Inventing telephone usage: debating ownership', p. 46.
[81] *Irish Times*, 15 Sept. 1882.
[82] *Irish Times*, 23 June 1882.
[83] Baldwin, *The history of the telephone in the United Kingdom*, p. 137; Kay, 'Inventing telephone usage: debating ownership', pp 174, 177.

were strong motivating factors for other to subscriber to the emerging telephone network. Other users also realised the technology's utility, for example fertiliser importers, stockbrokers and the Royal Dublin Society (R.D.S).[84] However, rental costs, while acceptable to large institutions, public bodies, businesses and extremely wealthy individuals, restricted the telephone's customer-base.

On the 19 May 1883, after just six months in operation, the TCI held its first shareholders meeting. E.D. Gray, M.P., as chairman of the board of directors, presided. Gray, until his death in 1888, was to be a major figure in promoting the telephone. As owner of one of Ireland's most prominent newspapers, the *Freeman's Journal*, he was a figure of considerable influence. In addition, Gray used his parliamentary seat to promote the interests of the new industry across the United Kingdom. He was active in highlighting in the British press the difficulties that the TCI had encountered when it sought to open public call-offices in postal telegraph offices, emphasising the shared difficulties that telephone companies in Britain and Ireland had in their dealings with the Post Office.[85] In particular he 'took a very active part on a special committee ordered by parliament to consider the position of telephone interests with regard to a Bill giving them a power of wayleave.'[86] It is likely that the, unsuccessful, parliamentary intervention of Charles Stewart Parnell on behalf of the TCI's application for a licence to open an exchange in Cork[87] was due to Gray's membership of the Irish Home Rule party.[88]

At the shareholders meeting Gray was able to report that on 31 January 1883 the company had a single exchange in Dublin with 301 customers, up from 87 the

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[84] *Irish Times*, 23 June, 18 Oct. 1882, 1 Jan., 2 Mar. 1883.
[85] *The Times,* 23 Jan. 1885.
[86] Report of ordinary meeting of the Telephone Company of Ireland, in *Irish Times*, 10 April 1888.
[87] Roddy Flynn, 'The development of universal telephone service in Ireland 1880-1993' (Ph.D. thesis, School of Communications, DCU, 1998), p. 110.
[88] F.M. Larkin, 'Gray, Edmund William Dwyer' in *Dictionary of Irish biography* (Oxford, 2009), available at Dictionary of Irish biography(http://dib.cambridge.org) (11 Oct. 2016).

previous year, and 105 renters of private wires, up from 64. On the 18 May, 4,200 telephone calls had been made, an average of eleven calls per subscriber.[89] From its revenue the company paid the postmaster general £133 for royalties and the UTC £329 for the purchase costs, royalties and rents for telephones.

At this meeting difficulties with the Post Office were also brought to the attention of shareholders. The TCI had applied for a licence to open an exchange in Cork but the Post Office had attempted to use this request to pressure the company into selling it telephones, in order to supplement its inadequate supply of Gower-Bell instruments. This had been prohibited by the UTC, which was using the supply of telephones as a bargaining tool in its ongoing negotiations to liberalise the telephone market. In the short term this impasse meant that the TCI was unable to establish exchanges outside of Dublin.[90]

There was a steady increase in the number of TCI subscribers throughout its early years of operation (fig. 5.3). In Dublin the company was busy expanding its system and by September 1884 had connected the city hall, mansion house, fire brigade stations, most of the significant corporation buildings and 'nearly all the Dublin hospitals'. Hospitals found the telephone particularly useful in co-ordinating their activities. Mercer's Hospital, Dublin, installed a telephone in order to liaise with other institutions in case of a cholera outbreak.[91] The utility of the telephone would only become greater as more hospitals were connected to the network. The city's exchange was at this point in operation twenty-four hours a day and this combined with connectivity to a wide range of important services encouraged subscribers.[92] While the size of the company's operations was small comparison to

[89] *Irish Times*, 19 May 1883.
[90] Report of ordinary meeting of the Telephone Company of Ireland, in *Irish Times*, 19 May 1883.
[91] *Irish Times,* 12 Oct. 1883.
[92] Report of ordinary meeting of the Telephone Company of Ireland, in *Irish Times*, 8 Sept 1884.

Britain, where by 1884 there were in excess of 11,000 telephones, it did signify a

demand for telephone services.[93]
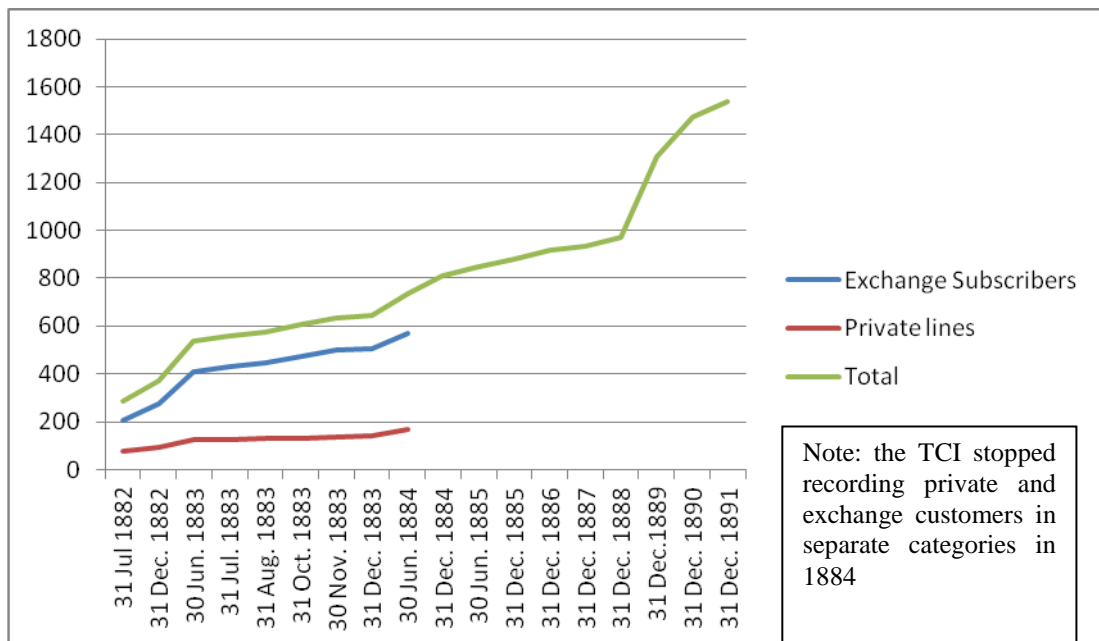
Fig. 5.3 Numbers of exchange and private line subscribers of the Telephone Company of Ireland, 1882-1891 (private subscribers were those without connection to a telephone exchange, while exchange subscribers were connected to such an exchange. Note: the TCI stopped recording these separate categories in 1884)
Source: Compiled by A.J. Kirwan from Director's report and statement of the accounts of the Telephone Company of Ireland, in *Irish Times*, 4 Apr., 10 Oct. 1884, 3 Apr. 1886, 1 Apr. 1887, 29 Mar. 1888, 25 Mar. 1889, 28 Apr. 1890, 22 July 1891, 9 Aug. 1892.

One of the main difficulties which the TCI's faced was the restriction of its

operations to a five-mile radius of the GPO.[94] By now telephone trunk-lines were in

use in England, connecting cities such as London to Brighton and Manchester to

Liverpool. However, up to this point private companies had not been allowed to

erect telephone trunk-lines; instead this was done by the Post Office which charged

the telephone companies for their use. In 1884 the Post Office began issuing its new

'Fawcett Licences' allowing the TCI to operate over any distance, open public call-

offices and construct its own trunk lines.[95] Under the terms of the TCI's new licence,

the Post Office was guaranteed ten percent royalty on the TCI's gross revenue of

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[93] Buchanan, 'Telegraph and telephone services', p. 965
[94] Director's report and statement of the accounts of the Telephone Company of Ireland for the year ended 31 Dec. 1892, in *Irish Times*, 10 Oct. 1884.
[95] *Irish Times*, 1 Nov. 1884.

over £8,000 per annum.[96] The general perception was that this new regulatory regime would increase the TCI's profitability was reflected in increased trading of the company's shares.[97]

With the granting of its new licence the TCI was to enter into a period of rapid expansion. In preparation, the company had constructed a telephone trunk-line, along the Dublin, Wicklow and Wexford railway line, connecting Dublin to an exchange in Kingstown. This telephone line was finished by October 1884 and with its licensing difficulties overcome, the TCI was offering to connect any premises in Kingstown, and within a mile of the railway line, to the exchange in Dublin. The company also planned to extend its network into other suburban areas and villages surrounding Dublin.[98]

This push to the suburbs must be understood in the context of the spatial distribution of Dublin's middle-class. With the growth of tenement dwelling in the city, bound by the Grand and Royal canal, new suburban areas were developing beyond. These were primarily inhabited by the better-off, for example by 1891 Dublin's population had grown to 349,594 with 44,881 labourers and their dependents, yet only 8,952 of these lived beyond the canals.[99] These new suburbs allowed greater segregation of classes demanded by increased social stratification of Irish society.[100] This process led to concentrations of middle- and upper class residents and such suburbs offered the potential for a healthy return on the outlay for a telephone trunk-line. Thus, with the central business districts serviced, the TCI's

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[96] Director's report and statement of the accounts of the Telephone Company of Ireland for the year ended 31 Dec. 1892, in *Irish Times*, 10 Oct. 1884.
[97] *Irish Times*, 9 Dec. 1884.
[98] Report of ordinary meeting of the Telephone Company of Ireland, in *Irish Times*, 18 Oct. 1884; Director's report and statement of the accounts of the Telephone Company of Ireland for the year ended 31 Dec. 1892, in *Irish Times*, 10 Oct., 13 Dec. 1884.
[99] Cullen, *An economic history of Ireland since 1660*, p. 166.
[100] Jacinta Prunty, 'Improving the urban environment: public health and housing in nineteenth-century Dublin' in Joseph Brady and Anngret Simms (eds), *Dublin through space and time* (2nd ed., Dublin, 2007), pp 166-220, at p. 167.

next important customer base was the wealthy businessmen, clerks and gentry living in the suburbs.

Using its new licence, the TCI opened six telephone call-offices,[101] allowing the non-subscribing public access to the telephone.[102] These call offices provided telephony to those who could not afford the annual subscription fee and, it was hoped, would be an important additional source of income. Mr Joseph Bond (J.B.) Morgan (the UTC's representative on the TCI's board of directors)[103] felt that a charge of 3*d.* in Dublin's suburbs and 6*d.* in Kingstown would be acceptable.[104]

In May, 1888, the utility of telephone call offices was highlighted when the Dublin Chamber of Commerce discussed its 'dissatisfaction with the new regulation imposed by the telephone company, by which members who are not subscribers to the telephone exchange are prevented from using the instruments without a payment of 3d for each time'. While the criticism was unwarranted, it demonstrates that these call offices allowed non-subscribing businesses to access the telephone. Given the high cost of telephone rental, which was a complaint across the United Kingdom, such offices were the only way many could access this service. This is a reminder that subscriber numbers do not provide a complete picture of the infiltration and use of the telephone.[105]

By 1885 the TCI had plans to construct an extension to Dalkey, Killiney and Bray. In October of that year the company, in addition to its central exchange at Commercial Buildings, Dame Street, had branch exchanges in Rathmines,

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[101] The offices were open at their head offices Commercial buildings, Dublin; their stores, 17 Golden Lane; and the branch exchanges in Rathmines, Blackrock, Kingstown, and Dalkey, source: *Irish Times*, 22 Oct. 1885.

[102] Flynn, 'The development of universal telephone service in Ireland 1880-1993', p. 110.

[103] J.B. Morgan (and J.B. Morgan & Co.) was a substantial shareholder in the UTC and also held 7,500 shares in the Lancashire and Cheshire Telephone Company, indicting a strong interest in the success of the telephone companies, source: Feuerstein, 'The early history of the telephone in England 1877-1911', p. 254.

[104] Report of ordinary meeting of the Telephone Company of Ireland, in *Irish Times*, 1 May 1885.

[105] *Irish Times*, 11 May 1885, 29 Sept. 1888.

Blackrock, Kingstown and Dalkey. It continued to erect lines to outlying suburbs and by October 1885 it had established a call office at Bray, where 'summer visitors … at a small charge could avail themselves of the advantage of the telephone in communication with other places while enjoying the fresh air'.[106] This demonstrates that the enlarged middle class who emerged in the late-nineteenth century, fuelling the growth of Bray as a holiday resort, were important users of the telephone system.[107]

The subscription rate for those within the four-mile city radius was £12 per annum with an additional charge of £3 per annum for communication to and from places outside of this, for example Kingstown.[108] The criteria for erecting these local trunk-lines were based purely on their ability to produce profit. While the TCI quickly developed lines 'to the principal suburbs around Dublin', wires to other suburbs would only 'be erected as circumstances may justify the necessary outlay.'[109] The expansion of the service was to see moderate increases in turnover, reaching £3,985 2*s.* 1*d.* in 1887.[110] However, such sums did not replace the considerable amount of money expended on construction and the company needed to maintain a tight grip on unrewarding expenditure.

When constructing new lines the TCI was quick to use the opportunity to encourage telephone subscription from the surrounding area. For example, when the company erected a line to the premises of Dr Eustace at Hampstead and Highfield, in Drumcondra north of the city, it was quick to offer a telephone connection to the

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[106] Director's report and statement of the accounts of the Telephone Company of Ireland, in *Irish Times*, 22 Oct. 1885; Report of ordinary meeting of the Telephone Company of Ireland, in *Irish Times*, 26 Oct. 1885.
[107] Cormac Ó Gráda, *Ireland: a new economic history* (Oxford, 1995), p. 239.
[108] *Irish Times*, 1 May 1885.
[109] Director's report and statement of the accounts of the Telephone Company of Ireland for the year ended 31 Dec. 1886, in *Irish Times*, 1 April 1887.
[110] Director's report and statement of the accounts of the Telephone Company of Ireland, in *Irish Times*, 29 Mar. 1888.

township commissioners. Despite their refusal to subscribe, in 1890 the good doctor again highlighted the benefits of telephony to the commissioners. The area around Drumcondra had several institutions, as well as Dr Eustance's Private Lunatic Asylum, these included: St. Joseph's Asylum for the Male Blind; St. Mary's Asylum and St. Joseph's Reformatory, High Park Convent. Eustance pointed out the benefits, such as rapid communication with the fire brigade, which telephony would provide to these institutions and the new (Roman Catholic) Archbishop's palace. The TCI promised to reduce its subscription charge to £13 per annum if there were enough subscribers. This type of marketing ploy provided plenty of incentive to customers, such as Eustace, to convince others of the benefits of telephony. Despite such efforts the telephone network's development was a slow process and restricted mainly to urban areas in this period. For example, by 1888 there were only 500 lines and three sub-exchanges in Dublin.[111]

In 1885, the TCI renegotiated its contract with the UTC, substituting payment from a percent of its earnings to a standard charge per instrument.[112] The directors intended to use the money this saved to encourage private subscribers to the service. This would aid its push to the suburbs where these private, middle-class subscribers were located. As business subscribers made more use of the telephone, and hence 'required a larger staff to serve them', it was felt that the introduction of a reduced £10 per annum charge for private houses would not only prove profitable but also encourage such subscriptions.[113]

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[111] *Thom's official directory of Great Britain and Ireland for the year 1888* (Dublin, 1888), p. 1555; *Irish Times*, 21 Nov. 1888, 5 Nov. 1890; Litton, 'The growth and development of the Irish telephone system', p. 82.
[112] Director's report and statement of the accounts of the Telephone Company of Ireland, in *Irish Times*, 22 Oct. 1885.
[113] Report of ordinary meeting of the Telephone Company of Ireland, in *Irish Times*, 26 Oct. 1885, 3, 13 Apr. 1886.

The central drawback with the telephone system was the lack of long-distance trunk lines. The TCI hoped to overcome this by providing direct connection to the GPO and through this the rapidly-expanding national and global telegraph system.[114] However, the high charges that the Post Office sought, £200 for a single wire and £300 for two wires between the telephone exchange and the GPO were to dash these hopes. In order to rectify this lack of connectivity the TCI was in the process of erecting a trunk line to Dundalk in preparation for the connection of Dublin and Belfast.[115]

The first exchange established, by the TCI, outside of Dublin and its suburbs was opened in Dundalk in April 1886. This exchange operated 'a call-fee system' with subscribers charged per call rather than a set annual subscription charge, as was the case in Dublin. Within a year the company's directors announced that revenue at this exchange was covering operating expenses and they were contemplating opening 'exchanges in other towns upon the same system.'[116]

Dundalk was ideally suited for the introduction of telephony. A seaport and municipal town located on the eastern seaboard, with a population in 1881 of 11,913. By 1886, the town possessed a number of industries, including: a distillery, brewery, flax and jute spinning mills, salt works, ship building, tanneries and an iron foundry. It also held a weekly market day, on Monday, and the county assizes. The town's harbour was in the process of being upgraded and its transportation links were completed by extensive rail connections: northward to Belfast, Enniskillen, Londonderry, Cootehill and westward to Clones, Cavan, Mullingar, Ballinasloe and Galway. In addition, a steam-packet service connected the town to Holyhead and

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[114] D.W. Winseck and R.M. Pike, *Communication and empire: media, markets and globalization, 1860-1930* (Durham, London, 2007), pp 16–112.
[115] Report of ordinary meeting of the Telephone Company of Ireland, in *Irish Times*, 26 Oct. 1885.
[116] Director's report and statement of the accounts of the Telephone Company of Ireland, in *Irish Times*, 1 Apr. 1887.

large quantities of livestock and other agricultural goods were exported from there to Liverpool. Thus, the town was integrated into wide trade-networks, had an important retail function and industrial base. These would provide the core business of the TCI and made the town a worthwhile investment for the company.[117]

The TCI's expansion was to continue and it opened an exchange in Cork city, 1 January 1889. Trunk lines were also constructed that year to connect Cork to outlying suburbs, including Queenstown, and the company was actively considering additional lines. The company's directors were hopeful for the exchange's prospects. It had twenty-four subscribers upon opening but had risen to 295 by 31 December 1889. This was a stark contrast to the Post Offices exchange in the city, having been in operation for the previous three years it never gained more than thirty subscribers at any one time. The success of the Cork exchange encouraged the TCI to open a further exchange in Limerick, which was under construction by March 1889.[118]

The telephone's progress was tied to its status as an implement of progress and modernity and its usefulness to business interests. In 1891 a deputation to the postmaster general, from the towns of Wexford, New Ross and Enniscorthy, were quick to highlight 'that the commercial community of these towns were well abreast of the times, and telephones, typewriters and all modern appliances for the expediting of business would be found in the district'.[119] The technology's status as a symbol of modernity could be seen in the work of the Electrical Engineering Company of Ireland, which installed private telephonic communication. Such a system was installed in the Hotel Metropole, Dublin, in 1892; it allowed guests to 'converse with each other' and a central exchange in the hotel. This 'useful novelty'

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[117] *Thom's official directory of Great Britain and Ireland for the year 1886* (Dublin, 1886), p. 1208
[118] Director's report and statement of the accounts of the Telephone Company of Ireland, in *Irish Times*, 25 Mar. 1889; Report of ordinary meetings of the Telephone Company of Ireland, in *Irish Times*, 28 Apr. 1890.
[119] *Irish Times*, 4 Dec. 1891.

became an important marketing tool. The same company was kept busy installing

private communication systems, such as the one used on the firing range at Ireland's

main military base, the Curragh Camp—as these were purely internal they were not

restricted by the postmaster general's monopoly over public transmissions.[120]

Telephone trunk-lines

Experimentation in long-distance telephonic communication continued throughout

the early years of the technology's development. At a meeting of the British

Association in July 1882 William Preece, the Post Office's chief engineer, recounted

the progress of the telephone. From its origins in 1877 when it was considered

nothing more than a 'scientific toy' it had become 'a powerful resource of

civilisation' with over £1.5 million invested in the development of England's

telephone network. Preece also highlighted the difficulties with long-distance

communication; while calls had been undertaken from Dover to Calais, telephone

conversions had not been possible over more than 100 miles of submarine cable.[121]

In 1878 W.F. Barrett experimented with long-distance telephony between

Norwich and London. It was obvious to Barrett that the barrier to communicating

long distances by was induction, particularly when telephone lines were in the

proximity of telegraph lines.[122] Induction is produced when an electric current

running through a wire in proximity to a telephone line causes it to mimic the current

in the adjacent wire; reports of hearing other calls during a telephone conversation

were evidence of this. For example, when the Royal Dublin Society was testing an

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[120] *Irish Times*, 18 June 1892; Feuerstein, 'The early history of the telephone in England 1877-1911',
p. 77.
[121] *The Times,* 3 Dec. 1878.
[122] Ibid.

early telephone a loud ticking was heard on the line. This was caused by the general electric clock system of the city.[123]

Induction was to be a serious problem for the early telephones of Alexander Graham Bell until Thomas Edison invented the carbon transmitter. This relied upon a battery to power the telephone, reducing the amount of current used and in tandem the amount of induction. However, difficulties were still experienced over long-distance lines.[124] While Preece was hopeful of overcoming these, for the time being these technological factors would determine the nature of the telephonic systems that would develop on the British Isles.[125] The telephone's inability to transmit over long distances, combined with Post Office restrictions on trunk-line construction, led to the isolation of urban telephone exchanges. As the British Isles had a well-developed telegraph system, which could transmit long-distance messages, this need not have had a massive impact on telephone use for urban business.

With the removal of restrictions on telephone trunk-line construction, in 1884, use of the technology for long-distance communication was becoming more and more realistic. The *Irish Times* as early as December 1884, re-reporting an article from the *Belfast Evening Telegraph*, was hopeful of the early establishment of a trunk line between Dublin and Belfast. Such a line would enable the 'communication between the Irish metropolis and the commercial capital of the country.'[126] This would be an important first step in providing long-distance telephony in Ireland. Another ambition, expressed by J.B. Morgan, the UTC's managing director in 1884, was that 'soon … they would be able to speak from

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[123] Barrett, 'On the electric telephone', p. 76.
[124] Anon, 'Telephony (an account of progress of Thomas A. Edison's invention)', pp 650-1.
[125] *Irish Times*, 30 July 1882.
[126] *Irish Times*, 17 Dec. 1884.

Dublin or Kingstown to London'.[127] Such a service would provide Irish telephone subscribers with rapid access to that centre of political and financial information.

It would to be 1890 before the TCI and NTC agreed to jointly construct a Dublin to Belfast telephone trunk-line. However, the TCI had expended a great deal of its reserves developing Cork's telephone system and replacing iron wires with copper in Dublin. The drain on the company's finances was such that it could only pay the dividend on preference shares that year.[128] Thus, with its coffers depleted the TCI would need to raise extra capital to fund the proposed trunk line. It initially offered its 'shareholders 10,000 new five percent, preference shares in proportion to their respective holdings.' But, there was little interest in the offer and the directors were forced to turn to borrowing.[129]

Despite the postmaster general's insistence in April 1891 that 'no public demand for a telephone service between Dublin and Belfast has hitherto been made to the Post Office', the two private companies proceeded with the line.[130] Once completed it would connect Dublin and Belfast via Dundalk, Drogheda and Balbriggan. In anticipation of increased traffic the TCI acquired a site for a new, larger telephone exchange from the Dublin Corporation.[131]

Ireland's first long-distance telephone trunk-line, establishing an eastern telephone corridor from Dublin to Belfast, was opened on 5 April 1892. Inauguration ceremonies were held in all the towns connected by the new line. In Dublin the inauguration took place in the Chamber of Commerce, where several telephones

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[127] Baldwin, *The history of the telephone in the United Kingdom*, p. 42, Report of ordinary meetings of the Telephone Company of Ireland, in *Irish Times*, 18 Oct. 1884.
[128] Director's report and statement of the accounts of the Telephone Company of Ireland, in *Irish Times*, 22 July 1891; Report of ordinary meetings of the Telephone Company of Ireland, in *Irish Times*, 30 July 1891.
[129] Report of ordinary meetings of the Telephone Company of Ireland, in *Irish Times*, 28 Apr. 1890.
[130] *Irish Times*, 14 Apr. 1891.
[131] Director's report and statement of the accounts of the Telephone Company of Ireland, in *Irish Times*, 22 July 1891; Report of ordinary meetings of the Telephone Company of Ireland, in *Irish Times,* 30 July 1891, 6 Apr. 1892.

were installed for the event. As well as directors of the TCI, a number of local notables and politicians were in attendance, with many taking advantage of the opportunity and exchanging 'several messages'. A similar scene was witnessed in Belfast where the mayor presided over the ceremony. While the rates for transmission were high—1*s.* between Dublin and Belfast and 6*d.* from Dublin to the other towns—,the line represented a tremendous opportunity to increase commerce between the two largest cities in Ireland.[132]

V.B. Dillon, by then TCI chairman, during a short speech highlighted that such lines were commonplace in Britain. Dillon—well aware of the poor state of the TCI finances—stated his hope that the Post Office would provide Dublin with the same telephonic facilities as Paris, namely connectivity to London by submarine cable. Such a connection would allow Dublin's merchants to 'communicate direct with their agents and representatives in London' and to 'receive replies in one moment from London, Liverpool, Manchester, Leeds, Bradford, and every important town in England.' He also hoped that the Post Office would provide trunk line connection between Ireland's major urban centres, such as Dublin and Cork. [133]

The new trunk line allowed subscribers, and the wider public through the use of public call-offices, in Dublin, Dundalk, Balbriggan, Belfast and Drogheda to communicate with each other. New call-offices at the company's headquarters in Commercial Buildings, Dame Street, and the Four Courts (Dublin's main court complex) would further extend this service.[134]

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[132] *Irish Times*, 5, 6, 19 Apr. 1892.
[133] *Irish Times*, 6 Apr. 1892.
[134] *Irish Times*, 19 Apr. 1892.

Developments in Britain

In April 1889 the three main telephone companies in Britain, the United Telephone Company, the NTC, and the Lancashire and Cheshire, merged to form a new company retaining the name: National Telephone Company (NTC). This new NTC held a virtual monopoly over telephonic communication in Britain.[135] It would remain a significant TCI stockholder, retaining the right to audit the company's accounts. Nonetheless, the TCI's chairman, V.B. Dillon, felt that 'practically the work of this company would for the present continue the same.'[136] The relationship between the companies was to change again in December and July of 1890 when two of the NTC's patents expired, reducing the TCI's royalty payments. The company hoped to offer its subscribers a reduced tariff when the rest of the NTC's patents expired in 1893.[137]

By 1892 telephony under the TCI had progressed significantly. The company had exchanges in Dublin, with connections to many of the city's suburbs. It had also provided connectivity between Dublin, Belfast, Dundalk, Balbriggan and Drogheda. In addition, it had established isolated telephone exchanges in Cork and Limerick. The Post Office, having nationalised the telephone trunk-lines in 1892, planned to construct a network of trunk lines throughout the United Kingdom, including a connection between Ireland and Britain (ch. VI). The TCI's directors hoped to open exchanges in cities 'such as Waterford, Kilkenny, Galway, &c' if and when the 'government carried out their proposals'. Such a network would allow communication throughout Ireland, Britain and 'ultimately … with France and the

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[135] Perry, *The Victorian Post Office*, p. 161.
[136] Report of ordinary meetings of the Telephone Company of Ireland, in *Irish Times*, 28 Apr. 1890.
[137] Director's report and statement of the accounts of the Telephone Company of Ireland, in *Irish Times*, 22 July 1891.

Continent',[138] but this would be contingent on the Post Office's willingness to pay for an Irish trunk-line network that was similar to Britain's.[139]

The TCI's board of directors realised that even if the Post Office were to construct telephone trunk-lines the company faced an uncertain future. It could simply not generate the capital required to meet its expansionist plans. In 1891 the company's efforts to expand and upgrade its network and the construction of a trunk line to Belfast had been funded by dividends and loans. In 1892 the company's directors claimed that they could pay not only preference shareholders but also had 'a substantial sum for division amongst the ordinary shareholders.[140] However, they were again forced to postpone payment. These funding difficulties continued into the following year, when there was a 'large expenditure on capital account' for maintenance and expansion. Added to this work, the company needed upgrade its network and exchanges in Dublin, Cork, Limerick, Dundalk and Drogheda, in preparation for the laying of trunk lines by the Post Office.[141]

By 1893 the company was in a precarious position, it had not been able to pay ordinary shareholders for a number of years and there was little appetite amongst its shareholders to provide additional funding. Without access to capital it could not continue to expand and would fail to take advantage of any future trunk line construction by the Post Office. The director's solution was a takeover by the NTC. This would not only solve the TCI's difficulties in terms of funding network upgrades but would also be carried out in a manner that was 'to the advantage of the

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[138] Director's report and statement of the accounts of the Telephone Company of Ireland for the year ended 31 Dec. 1891, in *Irish Times*, 9 Aug. 1892.
[139] Report of ordinary meeting of the Telephone Company of Ireland, 18 Aug. 1892, in *Irish Times*, 19 Aug. 1892.
[140] Director's report and statement of the accounts of the Telephone Company of Ireland for the year ended 31 Dec. 1891, in *Irish Times*, 9 Aug. 1892.
[141] Director's report and statement of the accounts of the Telephone Company of Ireland for the year ended 31 Dec. 1892, in *Irish Times*, 20 May 1893.

shareholders'.[142] While the Post Office had agreed to buy the NTC's trunk lines, one of the stipulations was that the NTC would purchase all the telephone licences in the United Kingdom. This placed the TCI in a good bargaining position, for example the NTC purchased the Thanet Telephone Company for £20,100 even though its only asset was a five-mile private telephone-line between Margate and Ramsgate.[143]

A provisional agreement was reached in 1892, whereby the NTC would purchase the entire assets of the TCI for £81,300 and would waive its right, as an ordinary shareholder, to any of this money. This would allow the TCI to repay its debts of £15,000 and pay £46,197 to preference shareholders and £20,213 to ordinary shareholders.[144] A final agreement between the two companies, dated 11 May 1893, was passed by the shareholders of the TCI on the 29 May 1893. V.B. Dillon highlighted the TCI's financial position; despite the generation of £6,000 in revenue the company had no money to pay shareholders.[145]

In Dillion's view 'the shareholders were not prepared to find any further capital' to fund the expansion and upgrading of the TCI network, demonstrated by the cancellation of a planned exchange in Waterford. The company had only been able to continue its upgrading work through the appropriation of the ordinary share dividend. The NTC, which owned half of the TCI's ordinary shares, was financially sound and could drive telephone expansion in Ireland.[146]

The shareholders were therefore left with the choice of continuing to deprive themselves of dividends in order to underfund the upgrading and expansion of the TCI's network or to sell their shares, recoup their unpaid dividend and allow the

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[142] Director's report and statement of the accounts of the Telephone Company of Ireland for the year ended 31 Dec. 1892, in *Irish Times*, 20 May 1893.
[143] Baldwin, *The history of the telephone in the United Kingdom*, p. 198.
[144] Director's report and statement of the accounts of the Telephone Company of Ireland for the year ended 31 Dec. 1892, in *Irish Times*, 20 May 1893.
[145] Extra-ordinary meeting of the Telephone Company of Ireland (to discuss the proposed transfer of the company's assets to the National Telephone Company), in *Irish Times*, 29 May 1893.
[146] Ibid.

NTC to properly fund telephone services. Logic won the day and the shareholders agreed to sell the company to the NTC, for just over £98,000. The transaction was completed in April, 1893. The directors of the TCI would be retained as a new Dublin board of the NTC, thus retaining local influence.[147] (The NTC's purchase of the Home Telephone Co., Limited, in the same month completed the consolidation of the United Kingdom's telephone companies).[148]

Conclusion

The development of the telephone in Ireland was initially driven by private non-exchange telephony. Uptake of the device was not automatic but instead depended upon the use of exhibitions, displays and lectures for its promotion. These were used to convince the public of its reliability as well as its utility. With the realisation of the profit potential of the telephones; the need for a licence to operate exchange's, established by the Post Office's monopoly over telephone as well telegraph transmission; and the establishment of the UTC greater, regulation was brought to the development of telephonic infrastructure. The subsequent establishment of the TCI points to a realisation that local knowledge and influence were important for the telephone network's development, such local companies could encourage subscriptions and overcome wayleave difficulties.

While the TCI made progress in expanding telephony in the three provinces of Ireland under its control—Leinster, Munster and Connaught—it faced many difficulties. While the funds raise from investors were initially sufficient for the company's expansion, they were not adequate in the medium-to-long term. The TCI's request for additional funding from its investors to construct the Dublin to

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[147] Ibid.
[148] Baldwin, *The history of the telephone in the United Kingdom*, pp 197–8.

Belfast trunk line was a failure and the company was forced to turn to borrowing. This was indicative of the wider conservatism of Irish investors, particularly given that the TCI was a local as opposed to a British company. While the company continued to generate sufficient revenue to meet its costs, its need to carry out significant upgrades to its existing networks and exchanges in preparation for postal trunk lines, and the further expansion that this would bring, could not be funded by continued borrowing. The only alternative to the continued underfunding of the telephone system and the denial of shareholder's dividends was to sell the company to the NTC, which was completed in 1893.

The NTC's formation in 1889 and the decision of the Post Office to assume responsibility for trunk-line telephony would have a dramatic impact on Ireland's telephone network. Trunk-line nationalisation and the eventual nationalisation of the NTC's operations in 1911 will be dealt with in the next chapter.

Chapter VI

The National Telephone Company in Ireland and Britain, 1893-1912

Introduction

By 1912 telephone exchanges[1] had been established in a number of Ireland's main urban centres. Many of these exchange areas were not only well connected to each other, by a network of telephone trunk-lines, but also to Britain. This expansion had been driven by two central factors, the first being the purchase of the Telephone Company of Ireland (TCI) by the National Telephone Company (NTC), 1893. The second was increased state involvement in the development of telephony throughout the British Isles. This was enabled by Post Office management, maintenance and construction of all telephone trunk-lines in the United Kingdom. This chapter will seek to understand the role that the NTC and the Post Office played in the development of Ireland's telephone infrastructure in the period 1893-1912.

The period 1893-1912 was extremely important for the development of telephony in Ireland. The NTC's vast resources—in comparison to the TCI—had the potential to fuel an immense expansion of the Irish telephone network. Increasing state involvement introduced a hitherto unknown into telephone development as government sought to meet the needs of the public for long-distance telephone trunk-lines. The telephone was becoming increasingly important for business communication and, to a degree, replacing the telegraph for this purpose. However, the poor quality of the service, high costs and lack of connectivity between urban centres led to many complaints. The government was initially weary of becoming too involved in the provision of telephony, particularly after the expense incurred by

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[1] A telephone exchange was a central node which allow interconnection between all telephones connected to it by telephone wires (see ch. V).

telegraph nationalisation, 1870 (ch. IV). Despite its objections, it was to nationalise all telephone trunk-lines in the 1890s.

The National Telephone Company

With the merger of the TCI and the NTC in 1893 the NTC's domain stretched across the whole of the British Isles.[2] It also ended the hope of competition that had been raised by the introduction of 'Fawcett licences' in 1884 (ch. V).[3] These licences had allowed individual telephone companies to operate across the United Kingdom and thus, ideally, to compete with one another.[4] Instead, they had led to a near monopolisation of telephony under NTC control. A number of factors had contributed to this, individual urban areas were seen as natural monopolies and it was unusual for more than one telephone company to operate in each. Telephone companies also sought to control large areas, by providing trunk line communication within these districts it became unprofitable for another company to build a replicate network. Control of larger areas also brought about an economy of scale as more urban exchange areas led to higher usage of the company's telephone trunk-lines.

The NTC was to suffer from a lack of wayleave rights throughout its existence. While the Post Office had an automatic right, the NTC had to negotiate with local government and property owners. There was much opposition to the granting of permission to lay telephone wire. This was particularly so when wires were laid underground, which caused considerable disruption due to the digging up

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[2] This company had been formed on the 1 May 1889, with capital of £4,000,000, through the merger of the United Telephone Company, the National Telephone Company and the Lancashire and Cheshire Telephone Company. It then bought up a number of smaller telephone companies: Northern District Company (April 1890), South of England Telephone Company (October 1890), Western Counties and South Wales Company (January 1892), the Telephone Company of Ireland (April 1893).

[3] R.J. Feuerstein, 'The early history of the telephone in England 1877-1911' (D.Phil. thesis, University of Sussex, 1989), p. 144.

[4] *Report from the Select Committee on the telephone service; together with the proceedings of the committee, minutes of evidence, appendix and index 1894*, H.C. 1895 (350), xiii, 4.

of roads and footpaths. However, such work overcame the need to erect unsightly

overhead wires, which required the permission of individual property owners.[5] The

NTC aware of the influence of local notables to press its business interests and,

perhaps most importantly, to pursue 'the removal of wayleave difficulties by …

personal influence' maintained a series of local boards throughout the British Isles.

Ireland would be divided into three engineering districts, Ulster, Dublin and the

south of Ireland. In Ireland, the NTC would retain two local boards of management,

in Ulster and Dublin, replicating the system in place prior to the purchase of the TCI.

The Belfast board kept the role that it had played under the NTC in Ulster and the

TCI's board of directors remaining as the NTC's new Dublin board with responsible

for the south of Ireland.[6] The retention of these boards demonstrates the impact of

agency on the development of technological networks. While it is natural to think

about telephone development in structural terms, focusing on pre-existing

communication channels, boarder economic and political factors, and the uses to

which existing groups put the new technology,[7] the impact of individuals with local

knowledge and influence cannot be underestimated.

The retention of the TCI board as the local (Dublin) board of the NCT meant

that it was in a position to bring local grievances to the NTC's general board. In

1884 the NTC proposed to reduce the annual rental charge from £12 to £10, if the

subscriber entered into a five-year contract. This in turn led to serious complaints

from its customers, including members of the Dublin Chamber of Commerce, in the

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[5] Michael Kay, 'Troublesome telephony: how users and non-users shaped the development of early British exchange telephony' in *Science Museum Group Journal*, iii (2015), available at (http://dx.doi.org/10.15180/150308) (27 Jan. 2016).
[6] F.G.C. Baldwin, *The history of the telephone in the United Kingdom* (London, 1925), p. 199; The National Telephone Company, 'Definition of the duties of the Belfast Local Board', 1893, p. 1, in Printed definitions of the duties of local boards and members of staff (BT archive, TPF/2/7); Background documents and publications (BT archive, TPF/2/13/7/1); *Irish Times*, 29 May 1893; *Evening Herald,* 27 May 1893; *Freeman's Journal,* 29 May 1893.
[7] Carolyn Marvin, *When old technologies were new: thinking about electric communication in the late nineteenth century* (Oxford, 1988), pp 4-5.

south of Ireland. As a result of these complaints, the local (Dublin) board's chairman V.B. Dillon—who was then Lord Mayor of Dublin—made representations to the board of the NTC. The result of this was the introduction of the reduced, £10, charge without the need to commit to a five-year contract. Thus, the Dublin board provided valuable assistance to the NTC in ensuring that local considerations were taken into account in the company's dealings with its customers, and it would perform this task on a more than one occasion.[8]

In addition to the retention of a local board, the two telephone districts in Ireland would have managers to deal with the day-to-day operation of the district and with customers.[9] V.B. Dillon was still involved in the activities of the NTC in Ireland at the beginning of the twentieth century. His firm was retained as the company's solicitors in Ireland, engaging in activities such as issuing instructions to counsel in court cases and dealing with complaints about the service.[10]

Irish telephony in 1893 was still a very regional affair. Ulster which had been under the control of the NTC since 1881 was more developed than the rest of the country. Belfast, the industrial heart of the province, had a number of telephone trunk-lines to outlying towns. A number of towns in the south of Ireland were also equipped with telephone exchanges. Dublin, the other major city on the island's east coast was, like Belfast, well connected to its hinterland. However, the only major long-distance trunk-line on the island was that which connected Dublin and Belfast (fig. 6.1).

Following the purchase of the TCI, the NTC was to enter into a period of aggressive expansion, during which telephone exchanges and call offices were opened in a number of towns. As can be seen in figure 6.1, NTC was giving

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[8] *Freeman's Journal,* 5, 10 April 1894; *Evening Herald,* 28 Jan. 1895.
[9] *Freeman's Journal,* 19 Mar.1894; *Belfast Newsletter*, 2 Mar. 1894.
[10] *Evening Herald,* 22 August 1900, 4 June 1901; *Freeman's Journal,* 14 May 1900, 13 June 1906.

consideration to significant expansion upon the purchase of the TCI (these trunk-line extensions are marked as broken lines on the map).

Between 1893 and 1903 telephony in Ireland under the NTC's guardianship made considerable advances. In Ulster a number of new offices opened with an improved trunk system providing greater connectivity between towns and cities. In the rest of Ireland the telephone network also underwent significant improvements. Exchanges had opened in many towns and trunk lines now connected many of the larger municipal centres to exchanges in outlying towns. For example, Cork city was connected to Queenstown (Cobh), Middleton, Blackrock and Passage. New telephone exchanges had been established in Galway and Limerick, with connections to other newly-established exchanges in Tralee, Castleconnel and Roxborough. Significant progress had also been made in the continuation of the Dublin to Kilcock trunk line which now ran as far as Mullingar.[11]

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[11] List of telephone exchanges (BT archive, TPF/3/1).
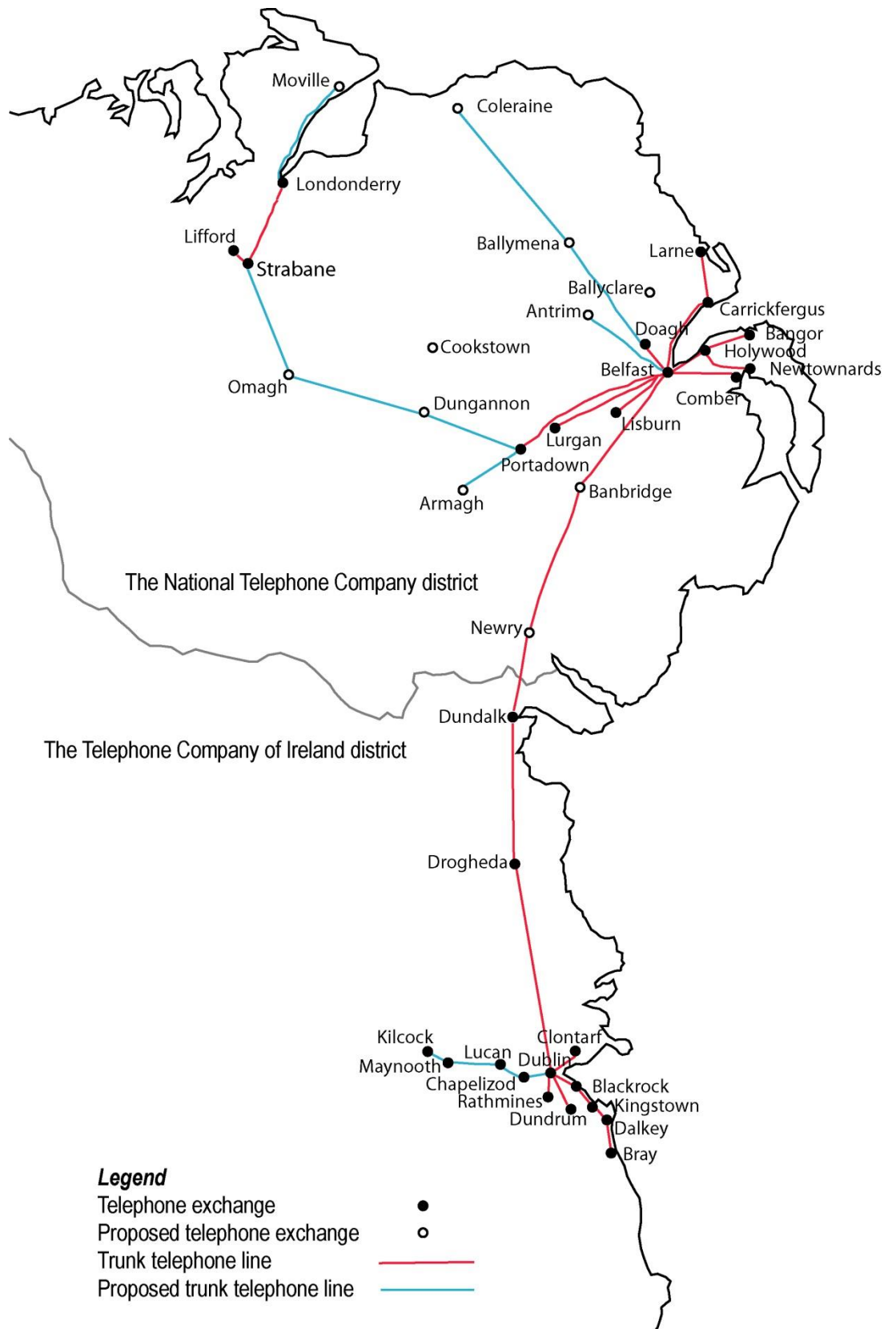
Fig. 6.1 Extract of Irish section of map showing exchange and trunk system, *c.* 1892
Source: Map of trunk lines, *c.* 1892 (BT archive, TPF/3/9/5).

As well as an increased numbers of urban centres with access to telephony, the NTC also significantly enlarged its Irish customer base, rising from 2,837 in 1893 to 9,985 by 1903, most of which were business rather than private subscribers. While the NTC continued to provide private wires, the bulk of growth in the period was from exchange lines (fig. 6.2). This demonstrates how important connectivity to other users was for the progress of the telephone. This importance could also be seen in the increase in telephone exchanges in the same period (fig. 6.3)—these were essential nodes in this system.
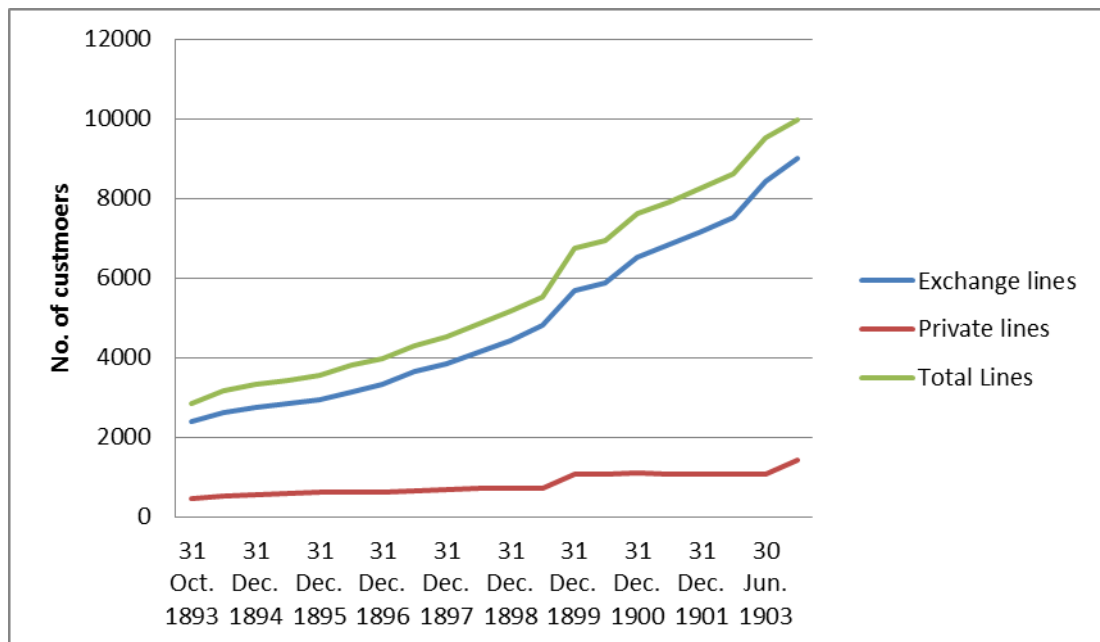
Fig. 6.2 National Telephone Company customers in Ireland, 1893-1903
Source: Compiled by A.J. Kirwan from Lists of telephone exchanges (BT archives, TPF/3/1).

From 1893-1903 the number of public call-offices[12] in the country also increased considerably (fig. 6.4). These offices provided access to the network on a pay-per-call basis (use of these was initially free to NTC subscribers) and, thus, considerably increased access to the telephone, particularly for those who could not afford subscription fees.

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[12] Call offices were enclosed kiosks, located in telephone company exchange buildings and other prominent premises, were the public could go to make telephone calls.
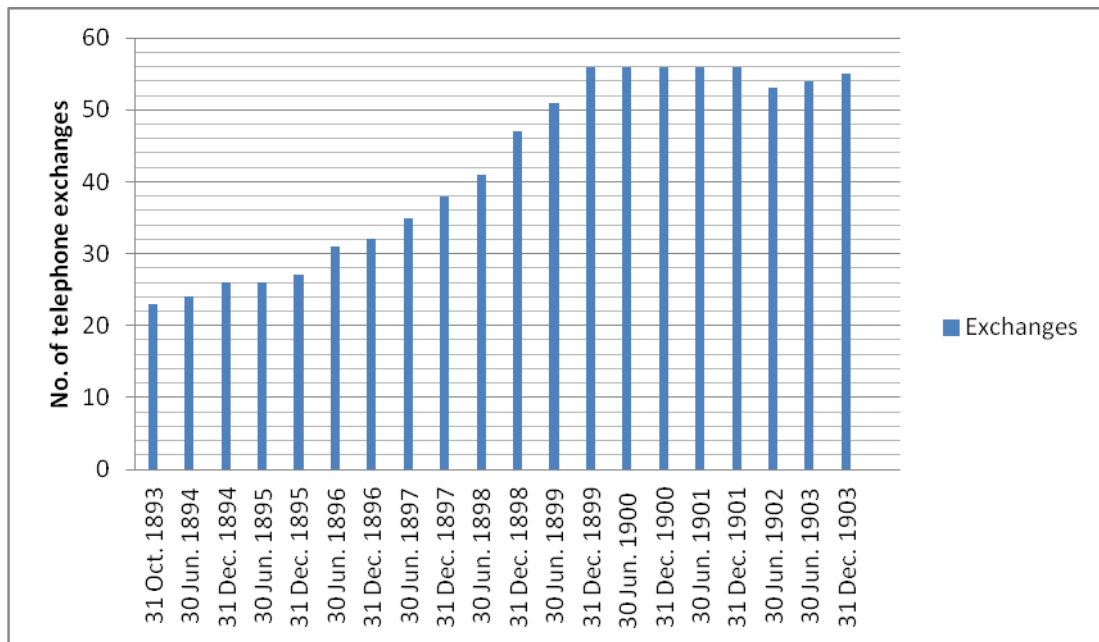
Fig. 6.3 Number of telephone exchanges in Ireland, 1893-1903
Source: Compiled by A.J. Kirwan from Lists of telephone exchanges (BT archives, TPF/3/1).
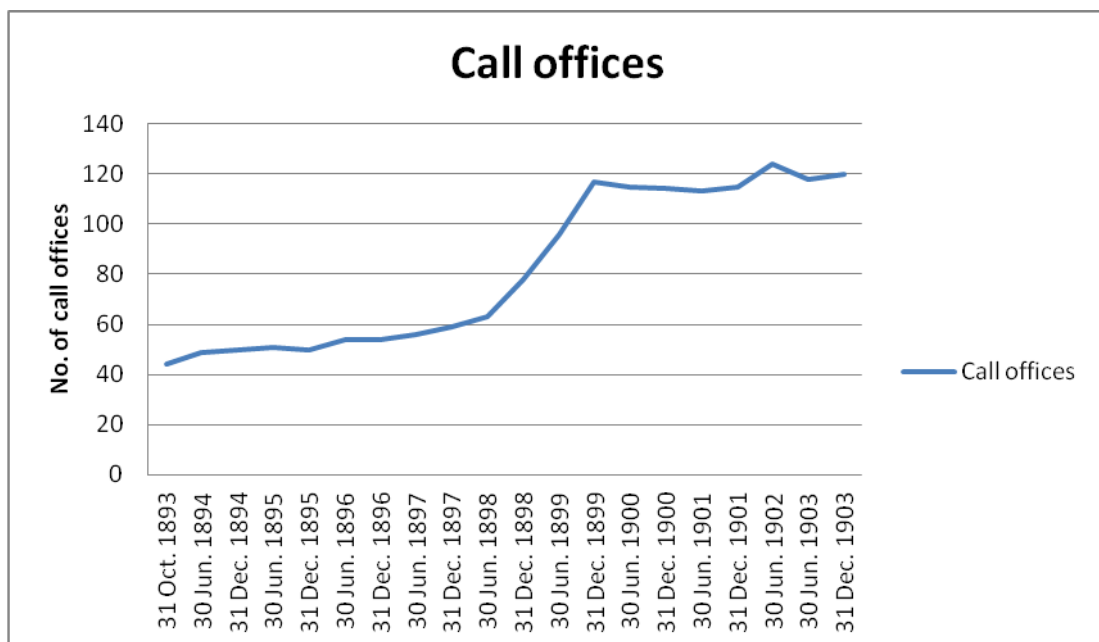
Fig. 6.4 Number of NTC call office opened in Ireland, 1893-1903
Source: Compiled by A.J. Kirwan from Lists of telephone exchanges (BT archives, TPF/3/1).

In pursuing its expansion plans the NTC, unlike the Post Office, was not afraid of closing unprofitable call-offices and exchanges. While figures 6.2 to 6.4 demonstrate the overall growth of the NTC's Irish network, these charts hide the

rapidity with which the company would open and close call-offices and, even, telephone exchanges deemed unprofitable.[13] This indicates the NTC's dynamic business strategy, designed to maximise revenue with little regard for the impacts brought by the removal of telephone services. It also shows that users were the primary drivers in the company's policies and the impact that the company's access to capital had on the development of telephony in Ireland.

By the being of the twentieth century the NTC was well established, with a considerable presence in a number of towns and their hinterlands (fig. 6.5); although it must be noted that the bulk of the country had no access to exchange telephony. The concentration of exchanges in towns that were centres of industry and trade highlights that the telephone was still primarily a tool of urban business. Examples of this included Belfast, which was a major industrial centre with significant shipbuilding and linen industries, and Derry, with an industrial base centred on the shirt-making industry which employed 98,000 factory and out-workers by 1902.[14]

Thus, the years following the NTC's merger with the TCI were marked by substantial increases in the geographic distribution and use of the telephone in Ireland. The technology's diffusion had proceeded rapidly under the NTC and by 1900 Ireland had fifty-six exchanges. In that year Dublin's central exchange was moved to a new facility at Crown Alley, in Dublin's Temple Bar, with capacity for 1,600 lines.[15] But it is worth noting that telephone usage in Ireland was still small in comparison to England (fig. 6.6). There the presence of more urban areas, that were often much larger, and had greater industrial, financial and mercantile centres, than those in Ireland, led to greater demand for telephony.

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[13] Lists of telephone exchanges (BT archives, TPF/3/1).
[14] L.M. Cullen, *An economic history of Ireland since 1660* (2 ed., London, 1987), pp 158-61.
[15] A. J. Litton, 'The growth and development of the Irish telephone system' in *Journal of the Statistical and Social Inquiry Society of Ireland*, session 115, (1961/2), pp 79-115, at p. 82.

Fig. 6.5 Map showing extent of telephone exchange areas and trunk lines in Ireland, *c.* 1905
Source: Plan of trunk line communication in Ireland (BT archive, Uncatalogued Map, in Map Box 8/2).

The difference between Irish and British demand for telephony was reflected in the NTC's expenditure on construction. For example, in 1899 the company was upgrading its network throughout the British Isles, including the introduction of metallic circuits (these were a major improvement over existing circuits) and placing many urban wires underground. In Ireland the completion of this work would cost an

estimated £24,654, including £12,240 on underground work, this was dwarfed by the £1,590,307 budget for the whole of the United Kingdom.[16]

The uptake of the telephone reflected wider economic realities. Ireland was a relatively prosperous country by the end of the century. Around half of its combined industrial and agricultural produce was exported. It had a well-developed banking system and significant export industries, including shipbuilding, linen, whiskey, beer and biscuit manufacture.[17] But outside of these industries, located in the island's main urban centres, the majority of the populace still worked the land. This limited industrial and mercantile base was to confine telephone development in comparison to a more urbanised and industrialised Britain.
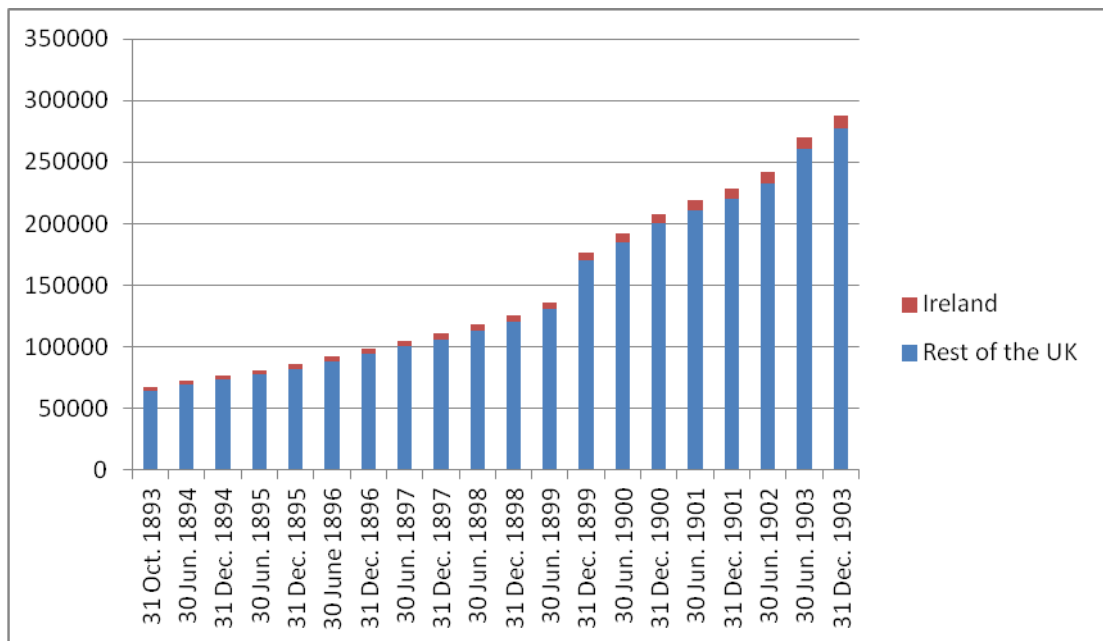
Fig. 6.6 Table of total telephone lines belonging to subscribers of the National Telephone Company in the United Kingdom (Irish subscribers are in red)
Source: Compiled by A.J. Kirwan from Lists of telephone exchanges (BT archive, TPF/3/1).

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[16] The National Telephone Company, Limited., Summary of estimated expenditure on underground work and metallic circuiting still to be done, general manager's office, 17 May 1899, in Background documents and publications (BT archive, TPF/2/12/7/1).
[17] Cullen, *An economic history of Ireland since 1660*, pp 167-8.

Telephony and the state

In the period leading up to the formation of the NTC and its purchase of the TCI, the government faced continuous pressure to aid in the development of telephony. Within the Post Office and Treasury there were conflicting views on what should be done with this new technology. While initially many were sceptical about telephony and its application to communication, by 1893 there could be no denying that the technology had overcome its initial technical difficulties and was being put to use more and more as a tool of business. For the Post Office this was to produce two distinct but interconnected problems. Firstly, there were growing calls for increased government involvement in what was becoming an important tool of business, including calls for the outright nationalisation of all telephone services on the British Isles.[18] The rationale for this was that under Post Office control the telephone network would be extended to areas that were unprofitable and, hence, untouched by the NTC's network.[19] However, after the massive expense of telegraph nationalisation, 1870 (ch. IV), the Treasury was reluctant to further involve the state in the supply of telephony.[20] The public demanded an enlarged and improved telephone trunk-line network. However, this would accentuate the second problem that telephone development had produced for the Post Office, loss of revenue as customers moved from the telegraph to telephone.

There were also technical problems with the new technology. In the 1880s William Preece, the Post Office's chief engineer, suggested that the difficulties with induction could be overcome with improved circuits. Such circuits were use in by the

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[18] C.R. Perry, *The Victorian Post Office: the growth of a bureaucracy* (London, 1992), p. 161; Movement for the nationalisation of telephones, 1899, pp 1, 7, in Background documents and publications (BT archive, TPF/2/13/7/1).

[19] Baldwin, *The history of the telephone in the United Kingdom*, p. 216.

[20] Chancellor of exchequer to postmaster-general, 22 June 1891, in Telephone precis [timeline], in Telephone policy papers (BT archive, TCB 304/1).

Mutual Telephone Company when it established an exchange in Manchester, 1891. The company used these circuits on its trunk lines to Bolton and they were noted for their superiority to the single wire circuits used by the NTC; these metallic circuits had also become the standard on Post Office telephone lines.[21] Thus, any potential Post Office trunk-line system would use 'twin wires, or metallic circuits, so that there may be an assurance of its efficiency.'[22]

The laying of improved telephone lines was preferable to some of the other measures suggested to improve long-distance telephonic communication. For example, the *Irish Times*, reporting on German experiments in long-distant telephony in 1894, noted that while singing was perfectly audible over the telephone speech was difficult to hear. The paper felt that 'singing might, therefore, be used with advantage in long-distance telephones.'[23] Luckily for those tone-deaf subscribers, the Post Office preferred a more technologically sound mode of improving telephone circuits.

With mounting pressure on successive governments to reform and improve telephony throughout the British Isles, the Conservative administration, in 1892, approved state ownership and expansion of the telephone trunk-line network. Following the issuing of new licences to the telephone companies in 1884, the Post Office had not constructed telephone trunk-lines between towns and cities due to fears that it would impact telegraph revenue. The Post Office's telephone policy was mainly one of non-competition with the private telephone companies; while it did continue to operate urban telephone exchanges, it would only open such an exchange

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[21] M.A. Kay, 'Inventing telephone usage: debating ownership, entitlement and purpose in early British telephony' (Ph.D. thesis, School of Philosophy, Religion and History of Science, University of Leeds), pp 107, 112, 205.
[22] *Treasury Minute, May 1892, on development of telephone system in United Kingdom,* H.C. 1892 (229), lxiv, 4-5; *Memorandum of Postmaster General, August 1894, on agreements with National Telephone Company and New Telephone Company,* H.C. 1894 (267), lxx, 3 (henceforth cited as *Memorandum on agreements*).
[23] *Irish Times*, 10 Mar. 1894.

where it was not in competition with another telephone provider. Thus, by 1892 the NTC was the main provider of trunk-line telephony. The nationalisation of existing, NTC, telephone trunk-lines and the construction of additional ones would be a significant departure from the Post Office's established policy.

As well as the provision of improved trunk-line telephony the Treasury and Post Office were motivated by the desire to maintain the revenue of the telegraph system—which the state had purchased and expanded at considerable cost—from encroachment by the telephone.[24] However, both departments also realised that it was 'impossible to continue the present system under which the telegraph revenue is seriously suffering, while, on the other hand, the extension of telephones is checked in a manner which cannot be permanently maintained.'[25] Thus, the existing government policy of limited involvement in telephony was becoming counterproductive. Not only was telegraph revenue suffering but the lack of progress in the development of the telephone network was a hindrance to the application of the technology to a plethora of uses. As had been demonstrated during the debate on telegraph nationalisation (ch. III), electric communication was considered an important public facility. Hence, it was perceived that by not actively encouraging its progress the government was hampering the economic well-being of the country.[26]

The NTC was reluctant to cede control of its telephone trunk-lines to the Post Office. In July 1891 the last two of the company's patents—belonging to Edison—expired. With the lapsing of the NTC's patents a rival company, the New Telephone Company, was established and began operation, primarily in the

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[24] Anon, *The Post Office, an historical summary* (London, 1911), p. 91; Perry, *The Victorian Post Office*, p. 167.
[25] *Treasury Minute, May 1892*, 3.
[26] Movement for the nationalisation of telephones, 1899, pp 1, 7, in Background documents and publications (BT archive, TPF/2/13/7/1).

Manchester area.[27] With patents no longer acting as a restraint on the establishment of rival companies, the NTC hoped its trunk-line monopoly would form a new barrier against competition.[28]

However, in December 1892 the New Telephone Company, while maintaining a separate corporate identity, was in essence amalgamated into the NTC. The re-establishment of a virtual monopoly by the NTC removed one obstacle to trunk-line nationalisation. The Post Office having entered into protracted negotiations to purchase the NTC's telephone trunk-lines threatened the company with exclusion from any potential postal telephone network. By 1894, this threat combined with the removal serious competition, in the form of the New Telephone Company, convinced the NTC to agree to trunk-line nationalisation.[29] This took place on 4 April 1896, when 29,000 miles of wire in thirty-three lines were transferred to state ownership at a cost of £459,114.[30]

In the intermediate period transmissions within local exchange areas were *gratis* upon payment of the subscription fee, with additional charges for all transmission beyond this. On NTC trunk-lines these charges raged from 3*d.* for under twenty-five miles to 3*s.* for between 175 and 200 miles, with an additional charge of 6*d.* for each extra twenty-five miles. Any calls transmitted over Post Office trunk-lines would be charged at prices ranging from 3*d.* for under twenty miles to 6*d.* for between twenty and forty miles, and 6*d.* for each additional forty miles, thus off-setting potential losses to the telegraph department. These rates would apply to Irish customers but for calls from 'Scotland, Carlisle, Workington, Whitehaven and

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[27] The National Telephone Company Limited, Reprint of special articles on the telephone service which appeared in "The Times," Dated 20th, 23rd and 24th January, 1899 (London, 1899), p. 9.
[28] Baldwin, *The history of the telephone in the United Kingdom*, p. 194.
[29] Postmaster general to Treasury, 5 August 1894, in telephone precis, in Telephone policy papers (BT archive, TCB 304/1).
[30] Anon, *The Post Office*, p. 92; Post Office to Treasury, in Telephone precis, in Telephone Policy Papers (BT archive, TCB 304/1); Perry, *The Victorian Post Office*, pp 173–4.

Maryport to towns in Ireland, and *vice versa'* the charge would be a combination of the NTC's tariff and the Post Office tariff for use of its submarine cable from Glasgow to Belfast. [31]

The nationalisation of the telephone trunk-line in 1893 left the Post Office in control of all long-distance electric communication: both telephonic and telegraphic.[32] This was a solution to another consumer complaint: that the creation of a virtual monopoly under the NTC had increased prices while decreasing the quality of the service.[33] From this point onwards the Post Office would be responsible for the maintenance and expansion of the United Kingdom's telephone trunk-line network. The private companies would be left to concentrate on the development of telephony in urban centres. This would not only relieve the NTC of its responsibilities to provide trunk-lines but also bring a new dynamic to their provision. While the NTC had been primarily motivated by profit, the government, through the Post Office, with its responsibility to the electorate would have a much broader view of which demands to satisfy when it came to the construction of telephone trunk-lines.

The government was attempting to steer a middle course between its existing policy of non-interference and complete nationalisation. While all telephone trunk-lines were nationalised to encourage competition and provide improved intercommunication between towns and cities, the bulk of urban exchanges would remain in private—NTC—ownership.[34] In addition, the Post Office would receive revenue for trunk-line calls, helping to placate fears of potential financial losses that

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[31] The National Telephone Company, trunk call tariff book, in Trunk call tariffs book (B.T. archives, TPF/4/4); Feuerstein, 'The early history of the telephone in England 1877-1911', p. 207.
[32] Copy of treasury minute, dated 23 May 1892, upon the proposals for the development of the telephone system in the United Kingdom (London, 1892), in Proposals for development of the telephone system in the United Kingdom, in Trunk lines constructed by the National Telephone Company, part 1, 1890-2 (BT archive, POST 30/707B).
[33] Perry, *The Victorian Post Office*, p. 161; Baldwin, *The history of the telephone in the United Kingdom*, p. 484.
[34] Anon, *The Post Office*, p. 91.

the telegraph's replacement by the telephone, for long-distance communication, would bring.[35] This solution also meant that the Post Office would not be drawn into a potentially onerous purchase of the NTC. Finally, when the telephone licences lapsed at the end of 1911 the Post Office could purchase the rest of the system at a much lower rate.[36]

To encourage greater use of the nationalised trunk-line network the Post Office would allow for direct transmission of telegrams using the telephone.[37] Given the limited distribution of exchange telephony and trunk-lines in Ireland this would allow communication with areas not connected to the telephone network. It would also benefit those who could not afford the high charges for calls to Britain or wanted to access the international telegraph network. The Post Office also undertook to 'gradually provide additional trunk wires, so that there may ultimately be a complete system of communication between all the important towns in the kingdom', included in these proposals was the laying of a submarine telephone-cable between Britain and Ireland. The total sum approved for telephone trunk-lines throughout the United Kingdom, including the original purchase, was to reach £2.3 million by 1898, an enormous sum by any reckoning.[38]

The NTC was issued with a new licence which restricted its activities to names urban areas rather giving it *carte blanche* access to the whole of the Britain, with all other areas, urban and rural, falling under Post Office control.[39] However, in Ireland the company could establish exchanges in any urban district.[40] It is likely that this clause was recognition of the underdeveloped state of telephony on the island

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[35] *Report on telephone service*, 7-9.
[36] Perry, *The Victorian Post Office*, p. 172.
[37] *Treasury Minute*, 3.
[38] Anon, *The Post Office*, p. 93.
[39] Anon, *The Post Office*, pp 91–2; *Report on telephone service,* 4.
[40] *Memorandum on agreements,* 43.

and the Post Office's lack of success in attracting customers to its four Irish exchanges.[41] The interconnection of urban exchange areas would be a matter solely for the Post Office.[42] However, connectivity to the new postal telephone network would be provided not only through private exchanges but also to 'any member of the public through exchanges at local post offices'; in Ireland the Post Office would open no new exchanges, retaining the four that it had opened in the early 1880s (ch. V).[43]

The Post Office would also help municipal authorities in laying telephone lines and 'aid the telephone companies in the improvement of their exchange systems, to place additional facilities at the disposal of the public, and establish telephone trunk-wires between the more important towns throughout the country.'[44] Hence, the state, through the Post Office, would become much more involved in the day-to-day operation of the telephone. This would have numerous benefits for telephone users: the transmission of telegrams sent by telephone, Post Office permission to establish of private telephone call-offices in sub-post offices, use of the Post Office's wayleave rights in the construction of local lines within the districts of private companies and permission to use the Post Office's wayleave on railways, canals and so on.[45] The new hybrid telephone system—with Post Office controlled trunk lines and NTC exchanges—had the potential to significantly improve Ireland's telephone infrastructure.

Central to the Post Office's plan for Ireland was the construction of a submarine telephone-cable to Britain. The first submarine telephone cable had been

[41] *Return of names of telephone exchanges which Post Office has opened in United Kingdom, number of subscribers and tariff, 1896-98,* H.C. 1899 (201), lxxviii, 2.
[42] *Memorandum on agreements*, 6; J.C. Hemmeon, *The history of the British Post Office* (Cambridge and Harvard, 1912), p. 224.
[43] *Treasury Minute, May 1892,* 3.
[44] Ibid., 5.
[45] Hemmeon, *The history of the British Post Office*, pp 222-5.

laid between England and France in 1891 by His Majesty's Telegraph Ship (HMTS)

Monarch; the service opened on 1 April 1891, with a charge of 8*s.* for three

minutes.[46] By April 1892, before the finalisation of the nationalisation agreement

with the NTC, the Post Office was proposing the connection of Glasgow and Belfast

with a telephone trunk-line consisting of two wires. This route was not only the

shortest submarine crossing, between the two islands, but also an obvious choice

given the economic connections between these two regions. This circuit would have

an aggregate mileage of 624 miles of wire, with a considerable section of submarine

cable. The Post Office decided to use the thickest grade of wire—800 lbs per

mile—to ensure the best possible signal.[47]

The Irish cable was completed on 5 April 1893 at a cost of £20,000, with

Lord Kelvin being one of the first to speak through it.[48] The continued expansion of

land-based telephone trunk-lines across Ireland brought many cities in Ireland into

direct telephonic communication with Britain for the first time. The new postal

telephone trunk-line network was formally opened by the Lord Mayor of London on

16 July 1895 when he spoke to dignitaries at Glasgow, Edinburgh, Belfast and

Dublin via the telephone.[49]

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[46] Baldwin, *The history of the telephone in the United Kingdom*, pp 482-3.
[47] Schedule of proposed trunk telephone circuits, in telephone trunk lines, estimate of cost furnished by engineer, file xxi, in Trunk lines constructed by the National Telephone Company, part 2, 1890-2 (BT archive, POST 30/707B); Telephone trunk lines, construction of Glasgow-Belfast cable to be deferred, 5 July 1892, in ibid.
[48] Peter Collins, 'Telephone', in S. J. Connolly (ed.) *The Oxford companion to Irish history* (Oxford, 2002), p. 566.
[49] Baldwin, *The history of the telephone in the United Kingdom,* pp 482-6.
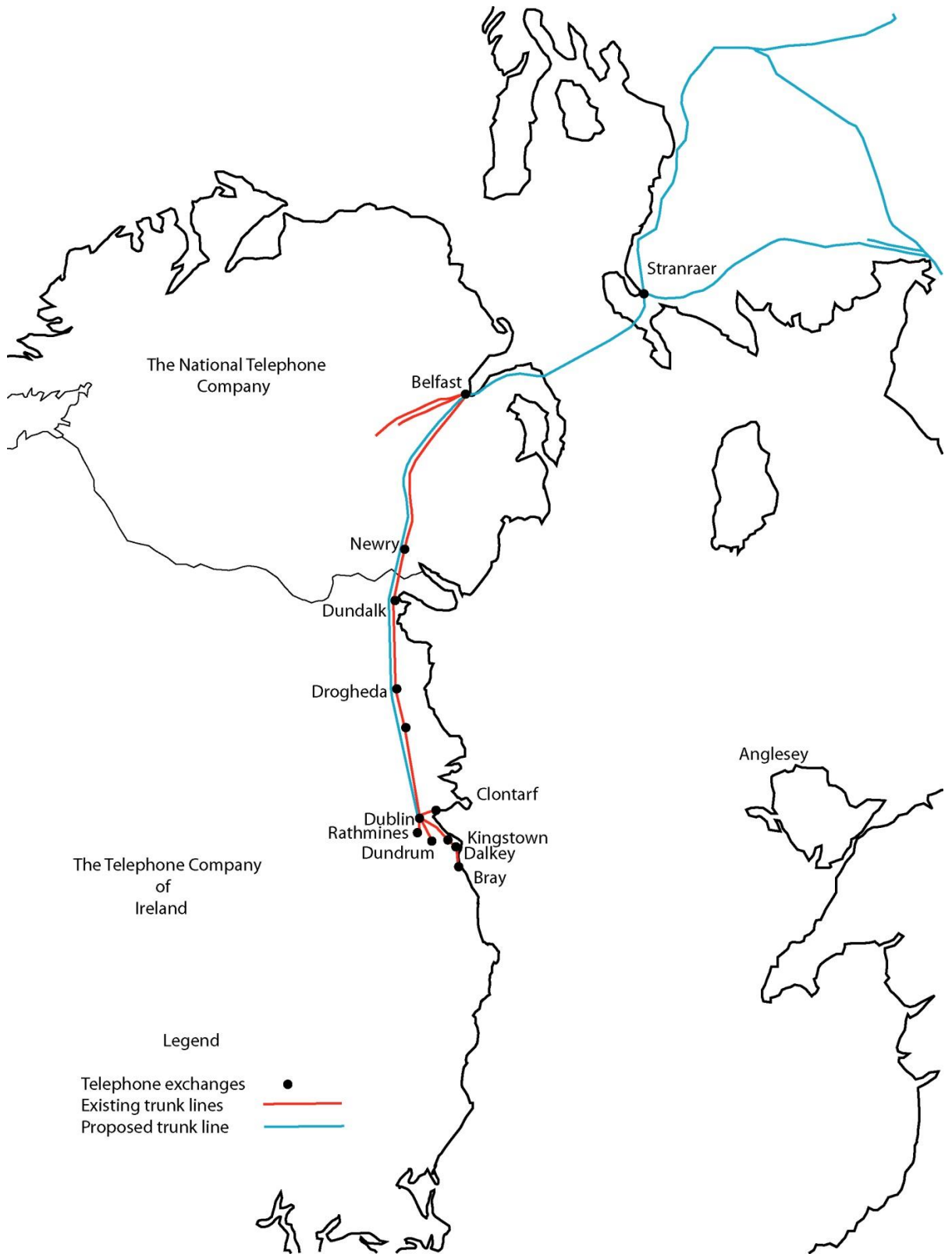
Fig. 6.7 Planned trunk line running from Scotland to Ireland, *c.* 1892
Source: Map of trunk lines, *c.* 1892 (BT archive, TPF 3/9/4).

The NTC had identified the need to erect a new telephone line from Dublin to the Irish end of this submarine cable, in Co. Antrim, replicating the existing line from Dublin to Belfast (fig. 6.7). This new line, probably a metallic or double circuit, would have increased conductivity, thus enabling audible transmission across the vast distances involved. Ongoing trunk-line construction in Britain would connect the submarine cable to Manchester, Liverpool, Leeds and eventually London, while in Ireland a further trunk line was built from Dublin to Cork.[50]

Telephone calls between Britain and Ireland proved to be extremely popular and in 1898 an additional cable was laid between Scotland, and Newcastle, Co. Antrim, Ireland, using the latest submarine cable design (fig. 6.8). Belfast was connected directly to Leeds and Glasgow and, via these, to much of Britain. By 1912, despite this additional cable, complaints were mounting. On top of the high demand placed on these circuits, which were operating at capacity, call quality was also a source of frustration. This was because:

> calls between England and Ireland […] have necessarily to pass over long land lines, the resultant attenuation of speech being so great that communication between Irish towns and towns in the south of England is always a matter of difficulty. Between some towns, indeed (e.g. between London and Cork), it is impossible to hold a satisfactory conversation except under the most favourable conditions.[51]

Thus, one should not presume that the laying of telephone cables produced a useful or complete service.

While the two existing cables did improve communication, there were difficulties. Archival sources demonstrate that the Post Office was receiving complaints about the service between the south of Ireland and the south of Britain by at least 1910. Consequently, due to technological limitations, it is probable that the

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[50] Baldwin, *The history of the telephone in the United Kingdom*, p. 486.
[51] Trunk telephone traffic between Great Britain and Ireland, proposed new cable, draft letter to Treasury, April 1913, in Proposed new cable for the trunk telephone service with Ireland, part 1 (BT archive, POST 30/2865C).

service had been poor from the outset. [52] This was particularly true for those further away from the terminal points of the cables at Belfast, Glasgow and Leeds. For example, on the 13 April 1912 Arthur Hughes & co, of 10 Burgh Quay, Dublin, wrote to the postmaster general stating that they had given up on the cross-channel service completely.[53]

Despite difficulties with the connection, telephone calls between the two islands continued to be popular, for example in March 1912 411 cross-channel calls were cancelled due to delays. While some could be attributed 'to exceptional activity on the London and Dublin Stock Exchanges', the fact was that 'even under normal conditions the lines are fully occupied.'[54] The annual revenue on existing cables totalled £2,034—at 1*s. 6d.* per call—this meant that there were approximately 27,120 calls between Ireland and Britain per annum.[55] Given the expense—this charge did not include the rate for the landline leg of the call—it is rational to presume that the bulk of this traffic was of a business nature and, hence, was a considerable figure for a largely agricultural island. In 1913, in order to satisfy demand and to improve communication between Ireland and the south of England, an additional cable was laid between Nevin, Wales, and Howth, Co. Dublin.[56]

Even with the high charge for use of the telephone cables, the Post Office was estimating that, with the addition of an extra cable in 1913, the service would be running a deficit of over £2,000 per annum. The construction of the 1913 cable

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[52] Trunk telephone service between Great Britain and Ireland, London-Dublin, complaint by Messrs. Guinness, Mahon and Company, 1910, in file I, in Proposed new cable for the trunk telephone service with Ireland, part 1 (BT archive, POST 30/2865C).
[53] Letter from Arthur Hughes & co., 10 Burgh Quay, Dublin to PMG, London, 13 April 1912, in ibid.
[54] Trunk telephone traffic between Great Britain and Ireland, proposed new cable, draft letter to Treasury, April 1912, in Trunk telephone service between Great Britain and Ireland, 1912, XX, 1913, in Proposed new cable for the trunk telephone service with Ireland, part 1 (BT archive, POST 30/2865C).
[55] Letter, in Trunk telephone service between Great Britain and Ireland, 1912, XX, 1913, in Proposed new cable for the trunk telephone service with Ireland, part 1 (BT archive, POST 30/2865C).
[56] Baldwin, *The history of the telephone in the United Kingdom*, pp 493–9.

demonstrates that demand was increasing throughout this period. [57] The fact that the Post Office proceeded with its construction, despite the predicted losses, demonstrates that the state viewed telephonic communication as an important public service. The provision of these telephone submarine cables to Britain were extremely important given that it was the biggest importer of Irish goods, and the significance of British financial and political information to Ireland.

While the provision of telephonic connectivity to Britain was an important service, it must also be remembered that the cost of transmitting a telegram, anywhere within the United Kingdom, had been reduced in 1886 to 6*d.* for twenty words inclusive of address. It was therefore 7*s.* cheaper to transmit a twenty-word telegram from Dublin to London than have a two-minute conversation. Thus, due to these exorbitant prices the telephone would not replace the telegraph for the transmission of newspaper and commercial intelligence and would only be of use to business where the rapid relaying of intelligence was important. Of course the government and wealthy individuals could afford this service but it is unlikely that they accounted for anything but an extremely low percentage of users (fig. 6.9).

FIG. 162.—Early Types of Telephone Submarine Cable.
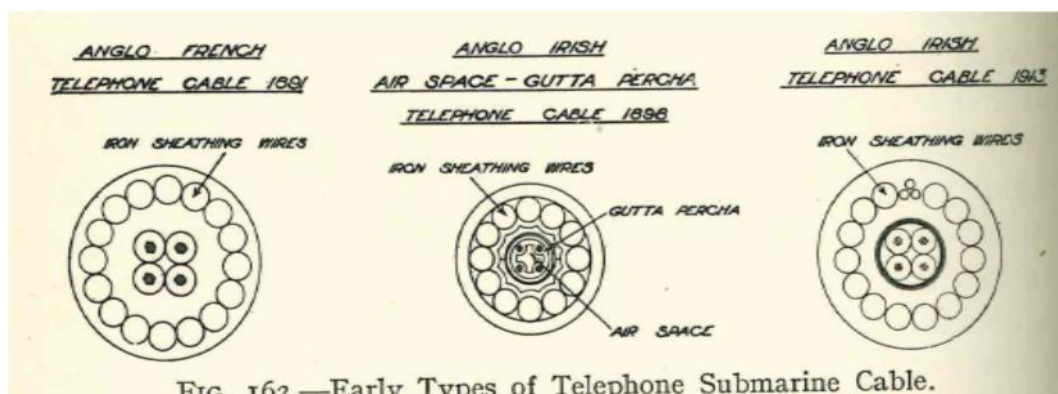
Fig. 6.8 Early submarine telephone cables, including 1898 Anglo-Irish cable
Source: Baldwin, The history of the telephone in the United Kingdom, p. 482.

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[57] Anglo-Irish telephone traffic, existing and proposed cables and land lines, in Trunk telephone service between Great Britain and Ireland, 1912, XX, 1913, in Proposed new cable for the trunk telephone service with Ireland, part 1(BT archive, POST 30/2865C).

City	Drogheda	Dublin	Dundalk	Edinburgh	Glasgow	Liverpool	London	Manchester
	s.d.	*s.d*	*s.d*	*s.d*	*s.d*	*s.d*	*s.d*	*s.d*
Belfast	0.9	1.0	0.6	3.6	3.0	4.6	6.6	4.6
Drogheda	--------	0.3	0.6	4.3	3.9			
Dublin	0.3	---------	0.6	4.6	4.0	5.6	7.6	5.6
Dundalk	0.6	0.6	---------	4.0	3.6			

Fig. 6.9 Charges for communication between towns in Ireland, 1884, and also selection of cities in Britain. Note: prices for Belfast include transmissions from Whitehouse, Whiteabbey, Bangor, Carrickfergus, Comber, Lisburne, Larne, Lurgan, Newtownards, Portadown and Doagh; while those from Dublin include Rathmines, Kingstown, Bray, Dundrum and Killiney.
Source: Drawn and complied by A.J. Kirwan from The National Telephone Company, Limited, trunk call tariffs book [1884] (BT archives, TPF/4/4).

In addition to the laying of a submarine telephone-cable between Ireland and Britain, the Post Office's plan to provide telephone trunk-lines had the potential to radically improve the interconnectivity of Irish towns and cities. This would significantly aid the NTC in the promotion of the telephone as a tool of long distance, as well as local, communication without the company having to contribute resources to trunk-line construction. Given the expense of these lines, which in the case of the TCI (ch. V) had virtually bankrupted the company, state involvement was a boon to telephone development.

The Post Office, in response to public demand, was to construct telephone trunk-lines throughout the United Kingdom, including a number of lines in Ireland. By the turn of the century this included one circuit from Dublin to Wexford, with an extension to Waterford, and another connecting Dublin to Limerick Junction, before dividing at this point and continuing to Cork and Limerick. By 1906 Belfast was connected to Omagh and Derry, while Dublin was also connected to Dundalk, Balbriggan and Mullingar via Clara. However, many towns and cities in Ireland were

to remain unconnected, Galway for example was not connected to the trunk system until 1914.[58]

Along with the company's considerable progress in the expansion of Irish telephony its workforce was also to increase in size. By the period 1909-11 the NTC was employing 568 members of staff across Ireland. What is perhaps most interesting is the allocation of staff through the three divisional districts: Ulster, 224; Dublin, 249; South of Ireland, 95. Obviously the large urban centres accounted for a significant part of this force with Dublin, Belfast and Cork accounting for over 150 staff members alone.[59] These figures highlight much of what had been seen throughout Ireland's experience with electric communication: that the industrialised north-east and the important trading and administrative centres utilised the technology to a far greater extent than the rest of the island.

The combined activities of the Post Office and the NTC greatly enhanced access to telephony across the British Isles and the service was to prove popular. In the years following the NTC's formation, 1889, the company's capital, income and subscribers were to continue to expand (fig. 6.10). By 1899 the NTC claimed that it was transmitting *c.* 450 million telephone calls per annum in comparison to *c.* 77 million inland telegrams across the British Isles.[60] These astronomic figures demonstrate the popularity of the telephone. However, it must be remembered that the telephone had all but replaced the telegraph for urban communication, with the telegraph's primary role now being long-distance, national and international, communication.

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[58] Litton, 'The growth and development of the Irish telephone system', p. 83.
[59] Organisation charts for the National Telephone Company, 1909-11 (BT archive, TPF/2/4).
[60] The National Telephone Company Limited, *Reprint of special articles on the telephone service which appeared in "The Times," Dated 20th, 23rd and 24th January, 1899* (London, 1899), p. 9.

Period year ending	Paid-up capital	Capital expenditure (exclusive of moneys expended in the purchase of lands, buildings, & c.	Number of lines	Gross income	Maintenance, renewals, repairs, rents, rates, taxes, and all working expenses	Post Office royalty	Dividends and interest	Reserve fund to date
	£	£		£	£	£	£	£
30 April 1890	2,511,583	2,589,120	26,086	380,075	157,590	30,494	143,643	53,500
30 April 1891	2,953,247	3,050,453	38,560	431,113	199,484	36,582	160,678	93,500
30 April 1892	3,267,322	3,371,445	47,878	463,741	236,252	40,239	178,249	104,627
30 April 1893	4,003,413	4,023,023	59,031	583,590	311,644	54,220	190,014	134,627
[20 months ending] 31 Dec. 1894	4,419,155	4,565,027	73,353	1,179,334	615,308	108,900	364,401	260,000
31 Dec. 1895	4,648,626	4,902,924	82,093	819,035	424,164	74,675	246,951	350,630
31 Dec. 1896	4,648,626	4,926,468	94,407	870,746	469,973	79,267	252,417	439,256
31 Dec. 1897	5,259,479	5,387,405	106,188	984,557	544,882	89,239	271,115	510,671
31 Dec. 1898	5,404,095	6,270,254	120,144	1,112,666	615,563	104,030	294,819	628,789

Fig. 6.10 Table showing the progress of the National Telephone Company from amalgamation of the companies in 1889 to 1898 (rounded to the nearest pound)
Source: The National Telephone Company Limited, *Reprint of special articles on the telephone service*, appendix.

Nationalising the National Telephone Company

The NTC was to continue to expand throughout its existence, however the fact

remained that its licence would expire on 31 December 1911 and, inevitability, the

Post Office would assume responsibility for the telephone. Consequently, the

government would either have to purchase the plant of the NTC or construct a

parallel system. In 1897 the Post Office requested a report from its solicitor, Robert

Hunter, on the possible purchase of the NTC's plant. He pointed out that as the

NTC's licence came closer to expiring in 1911 it would become more difficult for

the company to raise the capital it needed to meet the demands of the public. This

would no doubt impede telephone development and multiply complaints about the

service. Despite this it was decided against the purchase of the NTC at this

juncture.[61]

By the beginning of the twentieth century, pressure on the government to

improve the United Kingdom's telephone service was mounting. Debates concerning

complete nationalisation reach a peak when the NTC itself 'urged the desirability of

immediate State acquirement of the telephones'. In 1905 the Post Office entered into

an agreement with the NTC to jointly operate the former's telephone network in

London. After more negotiations, the two reached a final agreement, 2 February

1905, whereby the Post Office would assume responsibility for all the NTC's

operations from the 1 January 1912. This was to forestall any potential running down

of the system in the period leading up to the expiration of the NTC's licence.[62] The

final purchase price, following arbitration would be £12.5 million.[63]

Irish telephony under NTC patronage had expanded considerably. By 1911

the main urban centres on the island were well serviced with direct exchange

wires—these connected individual telephones to a central exchange. These included:

Belfast, 3,693 lines; Dublin, 3,446 lines; Cork, 911 lines; and Limerick, 302 lines.

On one day in July, 1911, there were over 107,000 telephone calls made in these four

cities; the bulk of them in Belfast and Dublin, with over 42,000 and 40,000 calls

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[61] Feuerstein, 'The early history of the telephone in England 1877-1911', pp 188-9.
[62] Ibid., pp 200, 218-20.
[63] Duncan Campbell-Smith, *Masters of the Post: The authorized history of the Royal Mail* (London, 2011), pp 194-5; Litton, 'The growth and development of the Irish telephone system', pp 83-4.

respectively. Thus, telephone usage was concentrated in these two urban centres, with an average of nearly twelve calls per subscriber each day.

Also of note was the number of junction wires for calls outside the exchange area—these were used to connect telephone users through their local exchange to either an exchange within the same urban area or, *via* a trunk line, to another city. Belfast with 110 such wires and Dublin 122, transmitted 8,154 and 10,348 junction calls, on one day, respectively.[64] These junction wires highlight the importance of inter-exchange connectivity and demonstrate the telephone's encroachment on the telegraph as a tool for long-distance communication (fig. 6.12).

By 1911 only four urban centres in Ireland had over 300 subscribers: Dublin, Belfast, Cork and Limerick. Given the relative size of most Irish towns and cities, and the small commercial centres they contained, the installation of a telephone for the transmission of eleven to twelve calls a day was a considerable expense. Even with a reduction in rental to £10 per annum, telephony was expensive. Additional charges for transmission outside the exchange area added considerably to this burden.[65] In addition, many smaller exchange areas, particularly those on the western seaboard, had no trunk line connection to the rest of the island.

On 1 January 1912 the Post Office took control of the NTC's network.[66] In preparation for this the NTC had carried out some construction and upgrading work. Expenditure on construction in Ireland was rather low in comparison to the rest of the United Kingdom. This was probably owing to the lack of Post Office exchanges, which reduced the need to amalgamate private and Post Office networks, as was the case in Britain. However, in light of the relatively small-scale of the Irish telephone

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[64] The National Telephone Company, Limited, operating statistics compiled from a record taken on one day in the week ending 29 July, 1911, at all exchanges with 300 Subscribers and over, in Telephone exchange operating statistics—volume 2 (BT archive, TPF/3/2/2, formerly POST 84/123).
[65] Ibid.
[66] Litton, 'The growth and development of the Irish telephone system', p. 84.

network it was still considerable. For example, expenditure in Dublin city in the six months leading up to nationalisation was: ordinary construction, £3,212 3*s.* 5*d.*; exchange construction, £337 14*s.* 1*d.*; special construction £10 0*s.* 0*d.*[67]

Having paid the NTC over £12.5 million the Post Office inherited over 9,000 employees, approximitely1.5 million miles of wires, over 561,000 telephone stations and 1,565 exchanges across the British Isles. Beside the municipal telephone networks in Hull, Portsmouth, and Guernsey, the Post Office was now responsible for all telephonic and telegraphic communication on the British Isles.[68]

Conclusion

The amalgamation of the TCI and NTC in 1893 was to herald a period of rapid expansion for Ireland's telephone network. By 1893, the TCI, relying as it was primarily on reluctant Irish investors, had run out of money with which to expand and upgrade its network. By selling the company to the NTC the TCI's shareholders were able to recoup their investment, safe in the knowledge that the NTC, with extensive capital and expertise, could fund the Irish telephone network. However, the NTC still faced significant difficulties due to its lack of wayleaves. Consequently, the company would retain local boards—in Ireland there would be one board for Ulster and another for the south of Ireland. These boards would consist of local notables who would use their influence to secure permission to lay telephone wires and to promote the NTC's business interests. This local input demonstrates that the development and expansion of telephony in Ireland was shaped as much by social factors as technological and commercial ones. The NTC was more than willing to

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[67] Summary of Accounts (BT archive, TPF/4/5).
[68] Hemmeon, *The history of the British Post Office*, p. 230; Baldwin, *The history of the telephone in the United Kingdom*, p. 229.

meet the demands of Irish telephone users and opened many exchanges and call offices on the island in the period of its control.

A central factor influencing the development of telephony in Ireland was telephone trunk-line nationalisation. The NTC while initial hostility to this—these lines acted as a barrier to competition—,was to reap the benefits of this policy. Given the lack of competition in Ireland; the low demand, in comparison to Britain, for such a service; and the poor chances of a return on its investment it was unlikely that the company would have financed trunk-line construction on the island. Thus, the completion of trunk-line nationalisation in 1896 was a boon to Irish telephone subscribers. The benefits of nationalisation included not only the construction of internal trunk-lines connecting many of the island's urban telephone exchange areas but also two telephone submarine cables to Britain. While customers attempting to call the south of Britain faced high charges and poor call quality, this service prove to be so popular that an additional cable connecting the south of the Ireland to Wales was constructed in 1913.

The growth of connectivity, both within Ireland and with Britain, brought by trunk-line construction, and the provision of more telephone exchanges led to significant increases in telephone subscribers. While the Irish telephone network would never approach anything near the scale of Britain's, it was, given the island's economy and population, to expand rapidly under NTC control. This in many ways vindicated the expectations of the directors of the TCI who felt that the NTC could raise the necessary capital for this development.

With complete telephone nationalisation in 1912 all telephonic and telegraphic communication on the British Isles was to become the responsibility of the state. Under state control the telephone and telegraph networks were to continue

to service governmental, business and increasingly personal needs but that is a

matter for another study. This thesis will now turn to the impacts that these

technologies had on many aspects of Irish society up to 1912.

<div align="center">**Chapter VII**</div>

<div align="center">**Electric communication and the news industry in Ireland, *c*. 1850-1912**</div>

> Scoop v.; To 'cut out' a rival reporter or editor, or his paper, by obtaining and publishing exclusive or earlier news.
>
> <div align="right">*Oxford English Dictionary*[1]</div>

A sought-after prize amongst any media outlet is the 'scoop'. Newspaper editors pride themselves on their ability to publish news before competitors and also realise that by doing so they are increasing their paper's popularity and profitability. This chapter will demonstrate the impact that the telegraph had on the news industry in Ireland, *c*. 1850-1912, in particular the manner in which it accelerated the transmission of news. It will consider the state of the Irish newspaper industry prior to the arrival of telegraphy in the 1850s, before turning to the provisions of what contemporaries termed 'intelligence' by the private telegraph companies before nationalisation of the inland telegraphs in 1870. It will demonstrate that, despite a plethora of complaints, the structures and methods put in place by these private companies for the collection and distribution of telegraphic news was to shape news-gathering from 1870 to 1912, and indeed beyond. The focus will then shift to the period following nationalisation. It will seek to understand the new relationship that existed between the telegraph, now controlled by the Post Office, and the press. Finally, the chapter will trace the growth of an international web of telegraph cables, the monopolies thus established, and the long-term impacts that telegraphy was to have on news reporting in Ireland.

It has long been recognised that the introduction of electric communication led to a reorientation of temporal and spatial relationships. New technologies introduced in the nineteenth century brought about a 'time-space convergence'

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[1] Scoop, *v*., *Oxford English dictionary*, available at Oxford English dictionary (http://www.oed.com) (16 Mar. 2016).

whereby the transportation speeds of goods, services and information advanced

beyond anything previously imaginable. The introduction and expansion of electric

communication accelerated this process of 'time-space compression', making

geographic locations temporally closer. The telegraph allowed human beings to

overcome the natural barriers of space and time. Henceforth, information, now

dematerialised, could move faster than physical carriers.[2] So profound was this

process that individuals and society were forced to alter how they viewed the world.[3]

The separation of information from physical carriers was to have significant impacts

on the operation and content of newspapers across the British Isles.

Central to the content of newspapers was access to intelligence. Intelligence

is information of events communicated or obtained from another; the term is

particularly associated with information of military value. Newspaper editors used

the term to signify information obtained from outside sources, such as other

newspapers, letters or by telegraph.[4] Eighteenth-century provincial newspapers had

to rely for intelligence on correspondence and other newspapers. London newspapers

had a distinct advantage for the collection of intelligence, allowing them to print and

disseminate news first. This gave them an obvious advantage over their provincial

competitors. Due to this, advertisements made up a considerable part of the content

of most eighteenth-century Irish newspapers.[5]

This chapter will seek to expand on the limited literature available on the

impact of the telegraph on newspapers, which has primarily enquired into the

acceleration in the transmission of intelligence. Thus, the organisation of news

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[2] Roland Wenzlhuemer, *Connecting the nineteenth-century world: the telegraph and globalization* (Cambridge, 2013), p. 26.
[3] Jeremy Stein, 'Reflections on time, time-space compression and technology in the nineteenth century' in John May and Nigel Thrift (eds), *Timespace: geographies of temporality* (London, New York, 2001), p. 106.
[4] 'Intelligence, n.' in *Oxford English dictionary*, available at Oxford English dictionary (www.oed.com) (14 June 2016).
[5] Robert Munter, *The history of the Irish newspaper, 1685-1760* (Oxford, 1967), pp 55-61.

collection and delivery, particularly in an Irish context, has been underinvestigated. This chapter will seek to contextualise the increasing speed of intelligence in terms of developments in the collection and distribution of telegraphic intelligence.

Infiltration of English newspapers

In 1700 it took seven to ten days for news from most European capitals to reach Ireland.[6] Not much had changed by the early nineteenth-century; slow transportation speeds, by sea and land, meant that news published in London would not appear in the Dublin press until three to five days later. As London newspapers were transported alongside this information both would arrive in Ireland at the same time, indeed editors often received the bulk of such intelligence from the London newspapers. This led, particularly outside Dublin, to the wide circulation of English newspapers, probably to the detriment of Irish newspapers.[7]

In 1831 the Irish Post Office ceased to be a separate entity; henceforth, control lay with the postmaster general of the United Kingdom. In this period the Post Office's role changed from a revenue department to a public utility; while the Post Office would still have to finance its operations from revenue, its new focus was on the provision of an important public service. Perhaps the best known impact of this new policy was the introduction of the 'penny post' in 1840. Under this regime a letter would be delivered to any address within the United Kingdom for one penny. Throughout the nineteenth century the Post Office continually attempted to improve the service it offered to the public. In particular, it was quite willing to adopt steam power transportation in order to accelerate the transmission of letters.

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[6] Christopher Morash, *A history of the media in Ireland* (Cambridge, 2010), p. 86.
[7] L.M. Cullen, 'Establishing a communication system: news, port and transport' in Brian Farrell (ed.), *Communications and community in Ireland* (Dublin, Cork, 1984), pp 18-29, at pp 19, 22-3.

The quality and cheapness of this postal service saw substantial increases in the volume of mail, reaching 65 million items in Ireland alone by 1870.[8]

The acceleration of physical transportation only increased the speed at which the London newspapers arrived for sale in Irish cities. By 1868, *The Times* (of London) was arriving in Belfast by four o'clock the morning after it appeared for sale in London; thus the Monday edition of *The Times* would be on sale in Belfast on Tuesday morning. Hence, without telegraphic intelligence newspapers printed in Belfast could not compete with London papers, as they 'could not give intelligence of what took place in London the preceding night.'[9] This infiltration by London newspapers was felt across the United Kingdom. In Britain the acceleration of transportation brought about by the application of steam to travel, particularly the railways, was to favour the metropolitan press over the provincial.[10]

Increasing sales of newspapers in Ireland in the nineteenth century was primarily driven by two factors. The first of these was the establishment of a national primary school system in 1831, long before the rest of the United Kingdom. This was to significantly increase the percentage of the population that was literate and who were thus potential newspaper readers. The second factor was the gradual removal of taxes, which had kept the price of newspapers quite high, including stamp duty, 1853, and paper duty, 1861. Newspapers began not only to get bigger but also cheaper; while Dublin newspapers in the 1790s cost 2-3*d.*, by the time the *Irish Times* first appeared in 1853, it cost 1*d.*[11]

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[8] Morash, *A history of the media in Ireland*, pp 73-5.
[9] Evidence of F.D. Finlay, in *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, H.C. 1867-68 (435) (465-I), xi, 105.
[10] A.J. Lee, *The origins of the popular press in England, 1855-1914* (London, 1976), p. 60.
[11] Colin Matthew, *The nineteenth century:Short Oxford history of the British Isles* (Oxford, 2000), p. 86; Morash, *A history of the media in Ireland*, p. 88.

Growth of telegraph network

From early in its development, telegraphy was intimately tied to the provision of 'intelligence', particularly stock prices and political news. As telegraph lines appeared throughout Britain they accelerated the delivery of intelligence to newspapers in the process. After some attempts in the early 1850s, Ireland was connected permanently to Britain by a submarine cable in 1853. Laid from Port Mora, Scotland, to Donaghadee, Co. Antrim, this cable was a catalyst in the expansion of telegraphy in Ireland. Telegraph wires were soon laid along most of the island's railway network. Through these cables telegrams could be rapidly sent from London, and other British cities, to Ireland (ch. II).

The introduction of telegraphy allowed the provincial press throughout the British Isles to challenge the hegemony that London newspapers had hitherto possessed over parliamentary and business intelligence. When first introduced, the service focused on sport, exchange and business news, all areas where speed was of the utmost importance.[12] Such information was invaluable to merchants and businessmen; while these groups could acquire the information themselves through the telegraph system, such an undertaking was expensive. Not only would individual telegrams have to be sent from stock exchanges, ports, corn markets and so on, but someone would have to collect and transmit the information. The reproduction of such intelligence in newspapers was to prove popular for two reasons. Firstly, it meant that much information that businessmen and others sought was available from one source. Secondly, while the cost of collecting this information was costly, newspapers were able to spread it across a high number of copies. This ensured that the reader could access all the information that they sought at a minimal price.

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[12] Lee, *The origins of the popular press in England, 1855-1914*, p. 60.

Therefore, privately-owned newspapers were in a way acting as an information co-operative: the division of the high cost of intelligence across its readership meant that access was much more affordable and, with increased volume in sales and the continuation of advertising, proprietors were also able to make a profit.

The popularity of such intelligence was nearly guaranteed. Not only was the public brought the latest information of important parliamentary debates but the availability of financial information, such as stock-market figures and agricultural prices, was important to merchants. Having access to such information could be a valuable asset, particularly if competitors did not. This would force businessmen, merchants, and so on, to purchase newspapers that had the latest telegraphic news in order to maintain a 'parity of intelligence' with their competitors.

By 1854, the Electric Telegraph Company (ETC) was supplying over 120 provincial newspapers with intelligence. These would receive between 4,000 and 6,000 words (the latter when parliament was in session) for a charge of £200 per annum. In Ireland the bulk of newspaper intelligence was supplied by the English and Irish Magnetic Telegraph Company (E&I MTC), the main provider of telegraphy on the island (and in much of northern Britain).[13]

The E&I MTC established two rates for the provision of newspaper intelligence. Newspapers could source such information themselves and would be charged the standard rate for transmission (this ranged depending on distance, for example a twenty-word telegram from London to Liverpool would be 5*s*.6*d*., while the same telegram from London to Queenstown (Cobh) would cost 10*s*. This would obviously be a considerable drain on the resources of any newspaper, for it would not only have to pay the exorbitant telegram charges rates but also for the time and

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[13] Jeffrey Kieve, *The electric telegraph: a social and economic history* (Newton Abbot, 1973), p. 71.

expenses of a reporter. The other rate was for the transmission of intelligence that was supplied by the telegraph company. By 1854 the company was supplying a daily intelligence report, consisting of one-and-a-half to two columns of 'the latest political, foreign, commercial, and market news' at a cost of 6d. for nine words. The company had agents, to collect intelligence, in towns where it had telegraph offices. According to the company's managing director, Edward T. Bright, it normally forwarded this intelligence to three or four news-rooms and a dozen newspapers in each town, thus making it quite a profitable undertaking.[14]

While the telegraph was to become essential to the operation of provincial newspapers, these were not the only customers which the companies serviced. A range of businesses, news rooms, clubs and exchanges contracted with the telegraph companies for the provision of intelligence. For example, in Belfast corn merchants were provided with corn prices from various exchanges, while the Lloyd's agents Sinclair and Boyd used the service for weather and shipping reports from Queenstown and Dublin.[15]

The new telegraph network provided an important route for political and financial information from the capital. By 1860 the *Irish Times* was publishing a latest news section that was received 'by magnetic telegraph', a reference to the E&I MTC.[16] The ability of the telegraph to transmit financial information was quickly realised and by 1860 newspapers were printing the opening prices of the London Stock Exchange.[17]

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[14] Edward B. Bright, 'Magneto-electricity on subterranean telegraphs (substance of an address delivered before the British Association of Science and Art)' in T. P. Shaffner, *Shaffner's telegraph companion, devoted to the science and art of the Morse American telegraph* (2 vols, New York, 1854), ii, pp 167-73, at p. 172; Charles T. Bright, Answers to Mr. Shaffner's questions, in Shaffner, *Shaffner's telegraph companion,* ii, pp 214-5.

[15] C. V. Boys to T.H. Sanger, 22, 28 Dec. 1868, in Intelligence department letter book a-c (B.T. archive, TGE 3/1/1).

[16] *Irish Times,* 30 Jan. 1860

[17] *Irish Times,* 3, 5 Jan. 1860.

As well as the transmission of information from across the United Kingdom, Ireland also received international intelligence from Reuters news intelligence agency. Reuters, based in London from 1851, immediately began to challenge the supremacy of *The Times* in the supply of international news, securing in 1858 contracts to supply international telegraphic news to seven London morning dailies. In January 1859 the E&I MTC contracted with Reuters to supply all its telegrams outside of London, the E&I TC receiving £350 per annum.[18].

Reuters considerably increased the speed at which news from around the globe reached Ireland. For example, intelligence from France could be transmitted and published within a day. Even further locations such as India, thanks to the rapidly-expanding global telegraph-network, were becoming temporally much closer to Ireland. News of events in Bombay on 18 of December 1860 was published in Dublin on 4 January, 1861. While such information was sought after, it would be a mistake to discount the role that mail continued to play in the collection of information. Telegrams from locations such as India could be garbled and, even if they were not, newspapers often relied on more traditional methods of intelligence gathering to compile more detailed reports.[19] Thus, newspapers still made use of other newspapers as sources of intelligence. But the telegraph was a valuable asset allowing for reports long before intelligence arrived by post. In addition, with the extension and development of telegraph networks across Europe, a continental information network developed. Ireland, well integrated into this telegraphic web,

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[18] Michael Palmer, 'The British press and international news, 1851-99: of agencies and newspapers' in George Boyce, James Curran and Pauline Wingate (eds), *Newspaper history: from the 17th century to the present day* (Beverly Hills, 1978), pp 205-22, at p. 206; Kieve, *The electric telegraph,* p. 71.
[19] *Irish Times,* 4 Jan. 1860.

was to benefit from the rapid access to information not only from Europe but also arriving at European ports from across the globe.[20]

Intelligence department

In February1865 following a period of competition, the three main telegraph companies on the British Isles replaced their separate intelligence operations with a unified 'Intelligence Department' (under the management of Charles V. Boys of the Electric and International Telegraph Company (E&I TC)). The profits of the new undertaking would be divided amongst the three companies, with the E&I TC taking forty-four percent, the British and Irish Magnetic Telegraph Company (B&I MTC) thirty-two percent, and the United Kingdom Telegraph Company (UKTC) twenty-four percent. Those subscribing to the service could also avail of reduced transmission rates of transmissions; from 7pm to 7am a fifty-percent reduction would apply, with a twenty-five percent reduction during the day.[21]

Until telegraph nationalisation in 1870, the Intelligence Department was to be a profitable enterprise, supplying up to 6,000 words per day for an annual charge of £250, with an additional cost of £150 for sporting news. This intelligence included parliamentary reports, the noon and closing prices of the London Stock Exchange, and reports from a large number of markets, such as the Cork butter market; Dublin, Cork, Leeds and Hull corn market; as well as financial reports relating to shipping and so on.[22] Any extra intelligence, such as long political speeches, would be charged separately. If more than one newspaper, in the same town, took intelligence, the charge ranged from £150 to £250 per annum with the average being £200. The

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[20] *Irish Times,* 5 Jan. 1860.
[21] Kieve, *The electric telegraph*, pp 71-2.
[22] C.V. Boys to F.I. Scudamore, 22 Sept. 1869, in Transmission of news by telegraph, correspondence with the Electric and International Telegraph Company with regard to the system of distributing news by the telegraph companies, p. 11 (BT archive, TGE 3/3).

telegraph companies also granted the newspapers reduced rates for the transmission of up to 200 words, but even with these reductions the rate for transmission still ranged between 1*s*. and 4*s*. for thirty words during the day and forty at night time (*4s.* being the standard charge for transmission between Britain and Ireland). Only 173 papers were granted these reduced rates, including 21 Irish newspapers based in Belfast, Cork, Clonmel, Dublin and Londonderry. Newspaper proprietors found payment for special telegrams extremely onerous. As noted by Post Office officials after nationalisation, a particular feature of the intelligence department was the fact that rates were charged 'according to [the] purse of proprietor', rather than a standard charge.[23]

The telegraph companies also increased productivity by renting special wires to newspapers at night, while the telegraph offices were closed. This would give a newspaper exclusive use of a telegraph wire connecting it to London for twelve hours at night, employing its own staff to collect intelligence. The charge for these ranged, depending on distance, from £500 to £1,000, the latter being the charge for Irish newspapers (ch. III). Only one Irish newspaper had taken up such a service, and this only happened in 1868.[24]

News intelligence was to be a boon for the telegraph companies. Not only was it a steady source of income but, as it was transmitted only during quiet periods, it allowed wires and operators to be kept productive throughout the day. Likewise the rental of a special wire meant that it was productive twenty-four hours a day,

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[23] Misc. document, News, tariff & regulation, in Post Office telegraphs (capital account) for the year ended 31 March 1882, in Telegraphs, acquisition by the state, various reports and papers from 1855 (BT archive, POST 30/306); Evidence of John Edward Taylor, in *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, 92; Evidence of William Saunders, ibid, 9; Evidence of Dr Cameron, ibid, 101.

[24] Misc. document, News, tariff & regulation, in Post Office telegraphs (capital account) for the year ended 31 March 1882, in Telegraphs, acquisition by the State, various reports and papers from 1855 (BT archive, POST 30/306); Kieve, *The electric telegraph*, p. 72; Evidence of Dr Cameron, editor and manager of the *Northern British Daily Mail*, in *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, 100.

rather than just when the local telegraph office was open. By 1868 the Intelligence Department was generating nearly £32,000 per annum; this was primarily from the collection and transmission of intelligence, but it was earning nearly £4,000 of this from special wires and over £2,500 from special messages. Of this just over £6,000 was spent on the collection of intelligence.[25]

By the 1860s, despite the advances made in the provision of telegraphic intelligence, many newspaper editors were unhappy with the service provided by the telegraph companies' Intelligence Department. Telegraphic intelligence had become essential to the provincial press, reliant, as it was, on it for not only commercial information but also for news of parliamentary business. The *Irish Times*, in March 1867, alerted its readership to the difficulties it faced. The late arrival of telegraphic summaries of important parliamentary debates was proving a serious inconvenience. If these were not on time the newspaper would have to go to press without their inclusion, thus depriving the public of information and, potentially, the newspaper of revenue. The writer felt that the considerable sums charged for the transmission of such intelligence should induce its timely transmission. Delays in the transmission of intelligence could be considerable, with intelligence being common knowledge in Dublin before the newspapers received it from the Intelligence Department.[26]

Added to difficulties with delays in the transmission of intelligence, complaints of poor quality were commonplace and many newspaper editors were unhappy with the intelligence service.[27] John Edward (J.E.) Taylor, proprietor of the *Manchester Guardian*, was to highlight the difficulties that editors faced. The

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[25] Kieve, *The electric telegraph*, p. 72; Misc. document, news, tariff & regulation, in Post Office telegraphs (capital account) for the year ended 31 March 1882, in Telegraphs, acquisition by the state, various reports and papers from 1855 (BT archive, POST 30/306).

[26] *Irish Times*, 20 Mar. 1867; *Irish Times and Daily Advertiser*, 16 Oct. 1867.

[27] Report of committee appointed by the Chamber of Commerce to consider the present condition of telegraphic communication in the United Kingdom, with a view to its improvement, in *Reports to postmaster general on proposal for transferring to Post Office control and management of electric telegraphs throughout United Kingdom, appendix,* H.C. 1868-68 (202), xli, 51.

content of intelligence transmitted by the telegraph companies was decided without any input from editors. Thus, they often received much information that they did not desire and did not receive other news that they did. In fact, the service was so deplorable that some newspapers had given up on it completely.[28] In an effort to overcome their difficulties Taylor organised a meeting of provincial newspaper proprietors, including representatives from Ireland, in Manchester, in 1865. However, attempts to establish a rival intelligence agency was still-born due to resistance from the telegraph companies.[29]

In Ireland, many prominent newspapers were reliant upon telegraphic intelligence. Francis D. Finlay, proprietor of the *Northern Whig* had been in receipt of such intelligence since Ireland was first connected to Britain by telegraph. He felt that the service was inefficient, with delays and errors; too costly, because much of the information sent, while charged for, was of no use, and gave the telegraph companies 'a power which they have used in a despotic and arbitrary manner.' Finlay himself had felt the wrath of the telegraph companies following an article published in his paper, 8 June 1868, when he complained about the service they were providing and openly called for the nationalisation of the telegraphs. On 13 June Charles V. Boys, superintendent of the Intelligence Department, wrote to Finlay stating that he found the attack unwarranted and that 'the time appears to have arrived when the directors should seriously consider whether the contract with your journal should be continued, and I have no doubt they will come to a decision which may afford you an opportunity of making your own news arrangements on less exorbitant terms.' The message was clear: either stop complaining or the companies

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[28] Evidence of John Edward Taylor, in *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, 91, 94.
[29] Lee, *The origins of the popular press in England, 1855-1914*, pp 60-1.

would force him to pay £1,000 per year for a special wire and, Finlay estimated, another £5,000 for the collection of news for transmission.[30]

Finlay was also unhappy with the excessive amount of foreign intelligence that he received, 'a considerable portion of which is so absolutely valueless to the Irish Press, that we do not even take the trouble to insert it.' In contrast there was much national (meaning from across the United Kingdom) news that he desired but did not receive, forcing him to resort to the sending of telegrams, and accruing the costs associated with this.[31]

However, were these complaints warranted? There is no doubt that there were difficulties with the service provided by the Intelligence Department. It sought to address these issues on a number of occasions, not only by investigating the cause of delays but also in October 1867 issuing a memorandum to its telegraph operators concerning complaints of errors and illegibility in the transmission of intelligence. This at the very least demonstrates that the department was interested in providing as efficient a service as possible. However, the intelligence service had developed as an ad-hoc arrangement to provide information to a range of clients, not just newspapers. Thus, while newspapers were a significant portion of its customers they were not its only ones. In fact the supply of intelligence to entities such as hotels, news rooms, private clubs and so on, was a bone of contention among newspaper editors, in their view depriving them of revenue. Hence, there was much truth in claims of poor quality of service.[32]

The *Manchester Guardian* had a history of challenging the telegraph companies' hegemony of intelligence supply; in 1856 it had attempted to get its own

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[30] Evidence of F.D. Finlay, in *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, 102-3.
[31] Ibid.
[32] Memorandum, no. 1147, October 1867, The Electric and International telegraph company to all stations, in Intelligence reports books 1865-9 (BT archive, TGE 3/5).

parliamentary intelligence reports. This was hampered by lack of space in parliament for reporters from the provincial press and the fact that the telegraph companies refused to transmit such reports unless they originated from their own intelligence departments. By the 1860s J.E. Taylor, the *Manchester Guardian's* editor, was seeking to form a new entity that would supply telegraphic intelligence to provincial newspapers, thus removing the need to deal with the Intelligence Department. However, due to resistance from the various telegraph companies, who were seeking three to four times the price of the existing service for transmitting intelligence, Taylor's idea was stillborn.[33]

In the view of the newspaper editors the solution to these difficulties was the establishment of an association dedicated to the collection of intelligence for telegraphic distribution.[34] With this aim, the provincial newspapers were to meet, 29 June 1868, at Haymarket, London. Irish newspapers, from across a board political spectrum, were well represented: out of the thirty proprietors at this meeting nine were from Irish newspapers. These were: F.D. Finlay, *Belfast Northern Whig*; Thomas Crosbie, *Cork Examiner*; David A Nagle, (Cork) *Daily Herald*; John Grey, J.W. Gray, *Freeman's Journal*; J. Robinson, *Dublin Daily Express*; Thomas Potts, Mr. Coulter, (Dublin) *Saunder's Newsletter*; H. Maunsell, *Dublin Evening Mail*.[35] This high percentage highlights how important telegraphic intelligence had become to the Irish press. The island's distance from London was a distinct disadvantage compounded by its physical separation from Britain. The barrier of the Irish Sea added considerably to the time taken to transmit intelligence and, thus, the

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[33] Lee, *The origins of the popular press in England, 1855-1914*, pp 60-1; George Scott, *Reporter anonymous, the story of the Press Association* (London, 1968), pp 21, 26-7, 60-1.
[34] Lee, *The origins of the popular press in England, 1855-1914*, pp 60-1; Scott, *Reporter anonymous*, pp 21, 26-7.
[35] *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, in notes appendix 3, 23; also in Scott, *Reporter anonymous*, appendix 2: persons present at the meeting of proprietors of daily provincial newspapers at the United Hotel, Charles Street, Haymarket on June 29, 1868, pp 284-5.

competitive advantages given to London newspapers could be overcome only by telegraph.

The outcome of this meeting was the establishment on 6 November 1868 of the Press Association (PA), with a capital of £18,000. The purpose of the new association was to replace the telegraph companies' role in the collection and distribution of telegraphic intelligence. This included a number of different types of intelligence, such as: foreign intelligence, parliamentary reports, general news, commercial news and sporting news. This list demonstrates the types and range of intelligence that the newspapers were now sourcing by telegraph and is indicative of how important the technology had become to the provincial press. The new company would also supply intelligence to clubs, newsrooms, hotels and private persons. The founders of the new organisation were careful to ensure that no one newspaper proprietor could gain control. The provincial newspaper proprietors also proposed new rates for the transmission of telegraphic intelligence by any new state telegraph service. These were 1*s.* for 100 words at night and seventy-five words during the day, as well as the availability of special wires for twelve consecutive hours at night.[36]

According to Taylor, the central objective of those who established the Press Association was not the reduction of charges but improved intelligence. He made clear to the parliamentary committee established to investigate telegraph nationalisation that the editors were willing to contemplate increased charges for improved intelligence (although he did this while he and his partners lobbied, and indeed secured, significantly reduced transmission rates for the press). The enthusiasm for telegraph nationalisation and reduced transmission rates for

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[36] *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, in notes appendix 3, 23-4; Lee, *The origins of the popular press in England, 1855-1914*, p. 61; Scott, *Reporter anonymous*, p. 30.

newspaper intelligence was perhaps best demonstrated by the 297 petitions in favour

of nationalisation that the government had received from the press (many of which

were from more than one newspaper). This was particularly impressive given that

only 163 newspapers were actually in receipt of intelligence from the telegraph

companies' Intelligence Department.[37]

Nationalisation

In 1868 the government brought forward a bill to nationalise the United Kingdom's

inland telegraphs. While the decision to take over telegraphy had many motivations,

one of the central concerns was the inadequacy of the intelligence service under the

existing privately-owned system. Due to self-interest the newspapers were at the

forefront of the nationalisation campaign and secured considerable concessions from

the Post Office in return for their support. The most significant would be drastically

reduced transmission rates. The Post Office would charge newspapers and the PA 1*s.*

for the transmission of 100 words at night or seventy-five words during the day.

Significantly, there would only be a 3*d.* charge for each additional address in the

same town. This would be a boon for the PA (and indeed Central News, a rival

news-gathering organisation founded in 1863) and was to lead to a drastic increase in

the volume of telegraphic intelligence that newspapers received. It also became a

considerable headache for Post Office officials as the supply of intelligence quickly

became unprofitable (ch. IV).

Nationalisation was completed on 5 February 1870 and its impact on the

newspaper industry was immediate; whereas editors had struggled to find enough

London and 'foreign' news to satisfy their customers, they were now inundated with

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[37] Evidence of John Edward Taylor, in *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, 91-4.

intelligence. The task facing news editors and reporters was also to change. The old system of sifting through the London and foreign newspapers had been replaced. Not only had journalists adequate intelligence with which to produce their own stories rather than merely summarising reports from other newspapers, but the cheap cost of telegrams meant that they could also travel throughout the country reporting back about events first-hand.[38]

Following nationalisation there were increases in the quantity of telegraphic intelligence transmitted. The beneficial rates offered to the press were to have serious long-term consequences for the Post Office. The cheap transmission rates, particularly the modest charge for additional addresses, meant that this service was not only operated at a loss but, with ever increasing amounts of intelligence, these losses continued to rise. The existence of the PA, which transmitted the same intelligence to a large number of subscribers only added to the Post Office's difficulties as it was only charge the news agencies 3*d.* for each additional address.

The use of telegraphic intelligence for the news industry was to spread rapidly following nationalisation. While the private companies had sent intelligence to 306 subscribers across the British Isles, of which 173 were newspapers, within a year of nationalisation the numbers had increased by 800 subscribers, of which 294 were newspapers. The extension of the telegraph network also meant that an additional 200 towns across the United Kingdom were in receipt of intelligence. The amount of intelligence transmitted had also increased from 4-6,000 to 15-20,000 words per day. The reduction in charges for special wires had also increased their popularity. By 1871 the *Irish Times* was able to transmit over 9,000 words of intelligence using this method in a single night, while the *Freeman's Journal*

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[38] Christopher Morash, ' Ghosts and wires: the telegraph and Irish space' in Karen Steele and Michael de Nie (eds), *Ireland and the new journalism* (Basingstoke, New York, 2014), pp 21-34, at pp 24-5.

employed agents in London to transmit long morning expresses for its second edition. By 1875 the Post Office was transmitting approximately 220 million words of intelligence per annum. This is even more remarkable when it is recalled that the main content of provincial newspapers at end of the eighteenth century was advertisements.[39]

The cheap supply of telegraphic news that accompanied telegraph nationalisation led not only to a greater supply of telegraphic intelligence for the news industry but also to the rise of ½*d*. evening newspapers. These were, in the main, compilations of telegraphic news, particularly concerning sport. While these never infiltrated the Irish market to the extent they did in England, where by 1880 there were slightly more evening than morning papers, they still made significant advances.[40]

While this was a drastic improvement on the service that had been provided under private ownership, it is perhaps also important to highlight that the provision of intelligence on the terms demanded by the Press Association meant that it was to be a loss-making enterprise for the Post Office. For example, by 1876 the central telegraph office in Dublin was spending over twice as much on clerks devoted exclusively to newspaper work as it was on those devoted exclusively to other work; yet the transmission of newspaper intelligence produced only a fraction of the revenue of regular telegrams, this despite the fact that the charge for regular telegrams had been reduced to 1*s*. upon nationalisation.[41] Thus, while there is no doubt that the provision of intelligence was to improve considerably following

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[39] *Letter from Postmaster General to Treasury, on report of committee to investigate causes of increased cost of telegraph service*, H.C. 1876 (34), xlii, 1-2; *Report on reorganisation of telegraph system of United Kingdom*, 703 [C 304], H.C. 1871, xxxvii, 32-3.
[40] Alan Lee, '1855-1914' in Boyce, Curran and Wingate (eds), *Newspaper history,* pp 117-129, at p. 122.
[41] *Report from the Select Committee on Post Office (Telegraph Department); together with the proceedings of the committee, minutes of evidence, and appendix*, H.C. 1876 (357), xiii, 252.

nationalisation, from a business perspective the reluctance of the private telegraph companies to cede to the demands of the newspapers was well founded.

International news

While the provision of domestic intelligence to the news industry was the remit of the private telegraph companies and, after 1870, the PA, neither had extensive operations beyond the British Isles. A number of international news agencies regulated the supply of telegraphic intelligence around the globe. In the United Kingdom this was predominately the responsibility of Reuters. While Reuters did face some competition in the supply of international news within the British Isles, its position was nearly unassailable due to a number of significant partnership arrangements. Firstly, the news agencies of Reuters (UK), alongside Havas (French) and Wolff's Continental agency (Germany)—two other major international news agencies—, formed a cartel in which they would supply each other with their respective domestic news without attempting to recruit customers in their partners' 'home' countries. Indeed Reuters' operations were so extensive that it had effectively operated its own cable between Lowestoft, England, and Norden, North Germany, prior to nationalisation. Reuters also had arrangements in place with the Indo-European Telegraph Company for the use of a minimum of one of its four wires between Norden and Teheran. (Its international cable concessions were sold to the Post Office upon nationalisation.)[42]

Secondly, Reuters entered into an agreement with the PA whereby the PA would supply all Reuters' intelligence outside of London and, in return, it would

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[42] *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, in notes appendix 4, 48-9; Oliver Boyd-Barrett, 'Market control and wholesale news: the case of Reuters' in Boyce, Curran and Wingate (eds), *Newspaper history*, pp 192-204, at pp 193-7.

supply Reuters with domestic intelligence for the international market. While the PA would pay Reuters for its service, the fee was substantially lower than individual papers had been paying.[43] In addition to news agencies, such as Reuters, many British newspapers employed their own overseas correspondents; a prime example was *The Times* (of London) which had extensive overseas correspondents and news collection arrangements. However, such provisions were expensive and beyond the reach of most Irish papers. As such they were particularly reliant on the PA (and, through it, Reuters) for foreign intelligence.[44]

The advent of the telegraph was to have repercussions beyond the mere acceleration of intelligence. By the 1880s the telegraph was fully integrated into the news industry. The telegraph provided fixed pieces of information from which a reporter would now mould a story. This in many cases removed the requirement to have a reporter at the scene of the event. It was the case that, even prior to the arrival of the telegraph, much news was taken from other newspapers, letters and the like. However, the technology did change the reality of reporting, particularly from the 1880s onwards. As Anthony Smith observed 'journalism became the art of structuring reality, rather than recording it.'[45]

The need for journalism to evolve beyond merely supplying information was strengthened by the fact that clubs, hotels and newsrooms also received such telegraphic intelligence. Thus, the public could readily gain access to the most up-to-date intelligence *via* the telegraph, often before such information was published in newspapers. For example, the Dublin Chamber of Commerce contracted with the

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[43] Boyd-Barrett, 'Market control and wholesale news: the case of Reuters', pp 193-7.
[44] Palmer, 'The British press and international news', pp 206-8, 214.
[45] Anthony Smith, 'The long road to objectivity and back again: the kinds of truth we get in journalism' in Boyce, Curran and Wingate (eds), *Newspaper history,* pp 153-171, at p. 167.

E&I MTC for the supply of news for an annual charge of £250.[46] Many newspaper proprietors were unhappy with the provision of intelligence to newsrooms but it did place an even greater onus on editors and reporters to provide analysis of events.[47]

Conclusion

The introduction of electric communication was to have a significant impact on the provision of intelligence to newspapers throughout the British Isles. This in turn was to change the manner in which editors and reporters operated and the very nature of newspapers. Newspaper sales were to grow throughout the nineteenth century. This increase was driven by a number of factors, including increased literacy and the removal of an oppressive tax regime. The content of provincial newspapers at the beginning of the nineteenth century was predominantly advertising, some local news mainly from court assizes, and news garnered from other newspapers. Due to this, important news was often available from London newspapers on sale in Ireland before it was available in Irish newspapers. This gave imported newspapers from London a distinct market advantage. The introduction of telegraphy and the connection of Ireland to Britain by submarine telegraph-cable brought about a new era in the transmission of news, by introducing a 'time-space compression'. The transmission of information had been separated from physical carriers, thus news intelligence could for the first time arrive in Ireland before London's newspapers. This gave Irish newspapers the ability to compete with such newspapers, in the provision of nationally and internationally important information, for the first time.

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[46] Abstracts of minutes of the Dublin committee of the B&I MTC, 20 Mar. 1864, in Abstracts of minutes, (BT archive, TGF/1/1).
[47] Evidence of John Edward Taylor, in *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*; Ibid, in notes appendix 3, 25-6.

The provision of intelligence was initially undertaken by the various telegraph companies. In 1865 the three main providers of telegraphy, the B&I MTC, the E&I TC and the UKTC amalgamated their intelligence activities, forming an Intelligence Department. This department would collect intelligence from throughout the British Isles, and using the services of Reuters international news agency from across the globe, then transmitting it to its domestic subscribers. This service had a number of advantages, the main one being that it was much cheaper for newspapers to subscribe to than pay for such a service individually. It was particularly useful to the provincial press, allowing it access to information at the same time as London's newspapers. Despite the benefits of the service, it was to elicit many complaints from subscribers. These included the expense of the service and late delivery of intelligence but the most prominent complaint was the inadequacy of the intelligence provided.

Following nationalisation, 1870, the Intelligence Department was to be replaced by a number of news collection agencies. The most successful of these was the PA. This was formed by a group of provincial newspapers, including many from Ireland. The new association was to work on similar lines to what had existed under the private companies. It would collect intelligence for distribution to its members. While this was to improve the quality of intelligence, the new cheaper transmission rates for intelligence introduced by the Post Office was also to increase the quantity, up to four-fold within a few years. The PA benefited from a relationship with Reuters news agency. Reuters had used the private telegraph companies to transmit its intelligence to the provincial press. It would supply the PA with international intelligence, in return for a reduced charge and the supply of domestic intelligence for Reuters' international market.

The information revolution wrought by the introduction of the telegraph, particularly following nationalisation when its volume increased exponentially, was to have a major impact on journalism. Not only did the content of provincial newspapers change, incorporating more news, but the type of journalism also altered. As telegraphic intelligence was delivered to a number of outlets, such as hotels and newsrooms, newspaper editors could not rely on the verbatim replication of intelligence as they had done when foreign newspapers were their main source of intelligence. Instead, to quote Anthony Smith (again), 'journalism became the art of structuring reality, rather than recording it.'[48]

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[48] Smith, 'The long road to objectivity and back again', p. 167.

Electric communication at work: governance and administration, *c.* 1850-1912

DEBATES BY TELEPHONE.

["The *Daily News* has already had debates reported by Telephone. Some day, perhaps, we shall have Parliamentary discussion 'laid on' like gas or water."— *Weekly Papers.*]

OON the eager poli-
tician,
Ere he nightly
seeks repose,
Will learn what M.P.
or patrician
Has voted with the
"Ayes" or
"Noes;"
Or calmly hear the
Commons talk-
ing,
And get its Tele-
phonic gist,
While the billiard
cue he's chalk-
ing,
Or he plays a game
of Whist.

Tropes and metaphors emphatic
Will meet direct the nation's ear,
While constituents ecstatic
From Kent or Yorkshire cry "Hear, hear!"
What the Tories may be hatching
Will be known before we sleep,
And no train be lost in catching
From the *Times* a hasty peep.

There may be some slight confusion
When Home Rulers, twelve at once,
With Hibernian effusion
Call each other "Fool" and "Dunce."
Rash Obstructives! But who'd fear 'em
If all night they shout "Divide!"
Though their words—if we would hear 'em—
Can be brought to our bedside?

Fig. 8.1 Debates by telephone
Source: Anon, 'Debates by telephone' in *Funny Folks* (London), issue 167, 9 Feb. 1878, p. 46

<u>Introduction</u>

The introduction of electrical communications to Ireland would provide a useful tool

for those seeking to administer and govern an island that was riven by agrarian and

political unrest throughout the period of this study. In particular, the permanent

telegraphic connection of the island to Britain, 1853, brought a new intimacy to Anglo-Irish communication. This connection would enable fast intercourse between the executive in London and the Irish administration in Dublin Castle, thus aiding in the governance of the island. Telegraph lines quickly spread along Ireland's railway network to ensure that the Irish administration could rapidly receive intelligence and transmit commands across the country. In the context of the growth and centralisation of the nineteenth-century state, these communication technologies would prove invaluable. The appearance of the telephone also offered many promises. The media was quick to highlight the technology's ability to transmit speech in an instantaneous manor. This would aid in relaying important political news and, in a period prior to the invention of radio, such transmissions were marvelled at (fig. 8.1).

This chapter will explore the uses to which electrical communications, in particular the telegraph, were put for the distinct but interconnected purposes of governing and administering Ireland. In this chapter, governance shall be construed as the methods and manner in which the executive at Westminster controlled Ireland. Administration implies the day-to-day management of Irish affairs from, primarily the chief secretary's office, Dublin Castle. Increased state intervention was a feature of this period and Ireland, due to its underdeveloped economy, was to experience this to a greater extent than Britain.[1]

Ireland's governance and administration in the nineteenth and early twentieth centuries was unique amongst the nations of the United Kingdom. The union of Ireland and Britain, 1800, unlike that between England and Scotland was to be legislative only, with Ireland retaining its own administrative centre in Dublin

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[1] R.B. McDowell, 'Administration and the public services, 1800-1870' in W.E. Vaughan (ed.), *A new history of Ireland, v: Ireland under the Union, 1801-1870* (Oxford, 1989), pp 538-61, at p. 543.

Castle.[2] The two central figures in this administration would remain the chief secretary who was a government appointee and head of the civil service in Ireland, with responsible for the legislative arm of the Irish administration, and the lord lieutenant, who was the political head. Regardless of suggestions that Ireland, now a province, no longer needed a lord lieutenant, the position was to be retained after 1800, albeit with some reduction in powers. As was see in chapter I, the ongoing conflict between Britain and France in the period of the union meant that Ireland's security was critical to the safety of the whole United Kingdom. Thus, the lord lieutenant, whose position as the Crown's representative allowed an independence of action, would be retained and remain responsible for defence.[3]

Despite the retention of the lord lieutenant, the role was curtailed over the course of the century. In contrast, the position of chief secretary, in theory subordinate to the lord lieutenant, became increasingly important both prior to but particularly after the union. The holder of that post would now attend Westminster when parliament was in session and act as the link between government and the Irish administration. The chief secretary was to be aided in his endeavours by a permanent undersecretary based in Dublin. This undersecretary would be the *de facto* head of the Irish civil service when the chief secretary was away on parliamentary business. Thus, the very nature of this dispersed troika increased the importance of rapid communication.[4]

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[2] Brian Jenkins, *Era of emancipation: British government of Ireland, 1812-1830* (Kingston, Montreal, 1988), p. 54.
[3] R.B. McDowell, *The Irish administration, 1801-1914* (London, 1976), p. 18; S.J. Connolly, 'Aftermath and adjustment' in Vaughan (ed.), *A new history of Ireland, v,* pp 1-22, at pp1-4; Jenkins, *Era of emancipation*, p. 55; Julie Brookes, 'The office of the Chief Secretary of Ireland', available at Chief Secretary's Office Registered Papers, National Archives of Ireland (http://csorp.nationalarchives.ie/context/index.html) (5 April 2016).
[4] Jenkins, *Era of emancipation*, pp 55-7; McDowell, *The Irish administration*, pp 55, 62-3; Tom Quinlan, 'The registered papers of the Chief Secretary's Office', in *Journal of the Irish Society for Archives* (Autumn, 1994), available at National Archives of Ireland (http://www.nationalarchives.ie/topics/Chief_secretary/CSORP.pdf) (5 April 2016), pp 2-3; Brian

Telegraphy in Ireland

The development of a national telegraph network in the early 1850s was to revolutionise communication in Ireland. While the network did have its limitations—it was, in the main, laid only alongside the railway—, it provided much of the country with rapid access to the island's administrative centre at Dublin Castle. Driving this early expansion of the telegraph network was the successful laying of a telegraph cable between Ireland and Britain in 1851. This quickly failed but a permanent connection was in operation by 1853. This rapidly accelerated communication between Dublin Castle and the government in Westminster. Indeed the secretary of the Electric Telegraph Company informed the government that it would place one of its wires at its disposal whenever required.[5]

Government expenditure on telegrams across the British Isles was to increase steadily over the early period of the technology's development. This included not only telegrams transmitted through the networks of the private telegraph companies but also the construction of lines for specific military purposes. In 1850 the state reached an agreement with the Electric Telegraph Company for the erection of such a line to connect the Admiralty in Whitehall to the Naval Board in Somerset House. In 1857 agreement was reach to connect the main army camp in Ireland, at the Curragh Co. Kildare, to the wider telegraph network. Its central purpose was to connect the base to the War Office. Agreement was also reached for the transmission of official telegrams from Dublin Castle.[6]

Jenkins, 'The chief secretary' in D.G. Boyce & Alan O'Day (eds), *Defenders of the Union: a survey of British and Irish unionism* (London, New York, 2001), pp 39-64, at pp 42-3, 45.
[5] Letter from the secretary of The Electric Telegraph Company to H. Waddington, Whitehall, 9 April 1853 (TNA, HO 45/4681).
[6] *Return of companies incorporated by Act of Parliament or Royal Charter with power to establish and manage lines of electric telegraph,* H.C. 1860 (434), lxii, 5, 14.

In contrast to its continental contemporaries, who funded the construction and operation of national telegraph systems, the British government left the development of telegraphy to private enterprise. Nevertheless, like other European powers, it realised the potential usefulness of the new technology as a tool of state and the government was careful to ensure that it could commandeer the telegraph networks when needed. This right was included in the charters that established the private companies (ch. II), and it was stated emphatically in *The Telegraph Act, 1863*, that

> where, in the opinion of one of Her Majesty's Principal Secretaries of State, an emergency has arisen in which it is expedient for the public service that Her Majesty's Government should have control over the transmission of messages by the company's telegraphs, the secretary of state, by warrant under his hand, may direct and cause the company's works, or any Part thereof, to be taken possession of in the name and on behalf of Her Majesty, and to be used for Her Majesty's Service, and, subject thereto, for such ordinary service as may seem fit; or may direct and authorize such persons as he thinks fit to assume the control of the transmission of messages by the company's telegraphs, either wholly or partly, and in such manner as he directs.[7]

This power was extended to the lord lieutenant of Ireland in 1866.[8]

In the period of private ownership, from the 1830s to nationalisation in 1870, the telegraph was used by the state for a variety of purposes. These ranged from the mundane, such as notifying senior officials of meetings,[9] to the relaying of important information, such as gunshots being fired at police offices.[10] It provided a new form of communication that was much quicker than existing postal and private messengers. Therefore, the telegraph could be a useful addition to the postal service for the transmission of correspondence between the chief secretary, in London, and

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[7] 26 & 27 Victoriae, [G.B.] (28 July 1863).

[8] *Telegraph Act amendment, a bill intituled an act to amend the Telegraph Act, 1863,* H.C. 1866 (23), v, 1.

[9] Letter to Thomas Larcom, 1862, in Larcom papers: Letters and cuttings, Peel and Larcom, controversy between Peel, O'Donoghue and Fr Lavelle, telegraph line between London and Cobh, 1862 (NLI, Ms. 7583).

[10] Copy of telegram just received from chief inspector of Cork, [N.D.] in Larcom papers: official correspondence, account of Irish telegraphs, 1868 (NLI, Ms. 7596).

the lord lieutenant and undersecretary, in Ireland. However, the arrival of the new technology also brought challenges to the Irish administration. Importantly, news editors could now obtain information quicker than had ever been possible. Daniel Headrick has highlighted the difficulties which such rapid communication brought to the British government in dealing with continental and colonial matters. The telegraph's rapid dissemination of news concerning contentious events, such as military confrontations, and the need to take account of public opinion restricted the government's room for manoeuvre in its international affairs.[11]

The telegraph not only provided a useful tool for senior Irish officials but, due to its use by the press, the government would be forced to use the technology to ensure that its own officials were aware of important events before the public. An example of this was a telegram sent on 25 February 1868 by Richard Southwell Bourke, sixth earl of Mayo—who had been the Irish chief secretary since 1852—, to the lord lieutenant, James Hamilton Marquess of Abercorn. The telegram's purpose was to inform Abercorn that the Prime Minister, Edward Smith, 14th Earl of Derby, had resigned.

Derby had led the conservative government since its formation in 1866. One of his administration's most notable achievements was the passing of the Second Reform Act, 1867, which had considerably enlarged the franchise. Derby's Chancellor of the Exchequer, Benjamin Disraeli, had been instrumental in the act's passing and won praise from many in the process. It was Disraeli, the telegram informed Abercorn, that had been nominated by Derby as his successor and he would go to the Queen the following day to confirm his appointment. As the queen's representative in Ireland it was essential that the lord lieutenant was kept informed of

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[11] D.R. Headrick and Pascal Griset, 'Submarine telegraph cables: business and politics, 1858-1939' in *The Business History Review*, lxxv, no. 3 (2001), pp 543-78, at p. 552.

political developments in Britain. The physical telegram has survived in the Larcom papers, thus highlighting the close working relationship between chief-secretary, under-secretary (Larcom), and lord lieutenant.[12] The telegraph, informing the lord lieutenant of the impending change in Prime Minister, is indicative of the uses to which the telegraph was put. The fact that this news was reported in the *Irish Times* the following day, 26 February 1868, also demonstrates that the government had to make use of the technology to maintain a parity of intelligence.[13]

Interestingly the telegram was written using a cipher, meaning that no one but the Irish administration would be able to read its contents—this was not the only such coded telegram that was sent.[14] Ciphers had been adopted by a plethora of users, for example stock brokers, for the transmission of sensitive information. A cipher replaced the words or letters of the message with other letters, which were then transmitted and deciphered by the recipient. Thus, ciphers provided for the secure transmission of important, secret and valuable information, such as stock or commodity prices or, in this case, matters of state.[15]

The use of ciphers in government telegrams was not unusual and a Wheatstone cryptograph instrument was installed at the Home Office and Dublin Castle for this purpose. Police forces across the British Isles, such as the Dublin Metropolitan Police (D.M.P.), used the Wheatstone A.B.C. (ch. IV) telegraph

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[12] Cipher telegram from Lord Mayo at Irish Office [London] to the lord lieutenant at [Dublin] Castle, 25 Feb. 1868, in Larcom papers: Letters and cuttings, Peel and Larcom, controversy between Peel, O'Donoghue and Fr Lavelle, telegraph line between London and Cobh, 1862 (NLI, Ms. 7583); P. R. Newman, *Companion to Irish History, 1603-1921: from the submission of Tyrone to partition* (Oxford, New York, 1991), p. 225; Desmond McCabe, 'James Hamilton' in James McGuire & James Quinn (eds), *Dictionary of Irish biography* (Cambridge, 2009), available at (http://dib.cambridge.org/viewReadPage.do?articleId=a3750) (12 Feb. 2016).
[13] *Irish Times and Daily Advertiser*, 26 Feb. 1868.
[14] For example see coded telegrams from the earl of Mayo to lord lieutenant, 17 June 1869, 27 July 1868, in Larcom papers: Letters and cuttings, Peel and Larcom, controversy between Peel, O'Donoghue and Fr Lavelle, telegraph line between London and Cobh, 1862 (NLI, Ms. 7583). [Unfortunately the decoded versions of these are not contained in the files.]
[15] K.G. Beauchamp, *The history of telegraphy* (London, 2008), pp 48-9.

apparatus and many made use of ciphers. A considerable draw-back to their use was cost; each ciphered letter was charge at the same rate as a word. Thus, a twenty-letter cipher would cost the same as a standard telegram.[16]

The Wheatstone cryptograph, in addition to use by government officials and police forces, was also used by the military for relaying information in the field. The device consisted of two rings; the inner one contained the letters of the alphabet that had been re-arranged using a formula based on a code word, the outer ring had an ordered alphabet. The device would then render a cipher using a mechanical system involving two arms. The longer arm would point to the outer ring, were the message was spelled out, and the inner arm would show the letters that were to be transmitted.[17]

The use of a cipher demonstrates not only the sensitivity of the information being transmitted by Mayo, but also the government's awareness of potential security risks in the telegraph system. Given the fact that the two telegraph companies operating in Ireland were both privately owned, with no government supervision of their staff, this is little wonder.

While the telegraph came to play an important role in the governance of Ireland, it was also becoming increasing important to the Irish administration based in Dublin Castle. This administration along with other important institutions, such as the Royal Irish Constabulary (R.I.C.) and the army, were in control of forces spread across the entire island. Centralisation was a significant feature of the Irish administration. Thomas Larcom, Irish undersecretary, highlighted, in the mid-nineteenth century, that 'party feeling' was strong on the island and these

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[16] *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill,* H.C. 1867-68 (435) (465-I), xi, 77, 85.

[17] Appendix no. 2, instructions for the employment of Wheatstone's cryptograph, p. 20, in *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill,* xi.

sensitivities necessitated an impartial government. Thus, even seemingly unimportant decisions were often referred to a central authority for fear of upsetting the delicate balancing act the government was preforming. The R.I.C., which was responsible for policing most of Ireland, and the D.M.P. were prime examples of this; any important decisions regarding their control, distribution and discipline were referred to the chief secretary's office.[18]

The centralisation of Irish policing was an aberration to British ideas of liberty. The British ideal was a local, non-military force, with no central (political) control. Peel, who was responsible for much reform of Irish policing, felt that a central difficulty was that local government and the provision of law and order by its 'natural' leaders had broken down. This led to a feud between local magistrates and Dublin Castle, which attempted to improve the provision of local justice. This struggle, played out over twenty-two years, convinced the Irish government that the traditional system of law enforcement, with primary responsibility centred on the magistrate and his constable, was not functioning. The administration of law and order was not helped by the poor condition of the county constabulary, members of which were appointed by the grand jury, controlled by the local magistrates and were considered generally worthless. Ireland, as viewed by the British state, did not conform to the norms of civil society and thus it was necessary to introduce policing methods, such as centralisation, that would not have been deemed necessary or acceptable in Britain.[19]

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[18] McDowell, *The Irish administration*, pp 68, 71; S. H. Palmer, *Police and protest in England and Ireland, 1790-*1850 (Cambridge, 1990), pp 359-60.
[19] Galen Broeker, *Rural disorder and police reform in Ireland, 1812-36* (London, Toronto, 1970), pp 22-3, 29; Rosemary Fennell (ed.), Thomas Fennell, *The Royal Irish Constabulary: a history and personal memoir* (Dublin, 2003), pp 4-5; Palmer, *Police and protest in England and Ireland*, pp 71-3, 75-6,

While there was a strong desire for a centralised police force that would allow the removal of irregularities in policing, the 1836 act that established the Irish Constabulary faced many opponents. In particular the enacting of the bill not long after the granting of Catholic Emancipation, 1829, by a Tory government and the reliance of the current Whig administration on O'Connell for support, was bound to raise suspicions about arbitrary government.[20]

The intelligence activities of the RIC alone highlighted its uniqueness, it having more in common with policing in India than Britain. Such activities increased the importance of speedy and secure communications. The Irish Constabulary formed in 1836, armed, subject to military discipline, and centrally controlled, was formed more on continental than British models of policing, with its first inspector-general comparing it to a light infantry regiment (the Royal prefix was granted after its efforts in suppressing the Fenian rising, 1867). The inspector-general was firmly embedded in Dublin Castle and a strict hierarchical structure—ranging from constables, to chief constables, to sub-inspectors, to county inspectors, to two Dublin-based deputy inspectors-general and finally to the chief-inspector—was enforced. The very structure of the new force would generate a great deal of paperwork. This bureaucracy was compounded by its use as a 'sort of civil service' including, for example, the collection of statistics on a range of subjects such as evictions, loan funds and emigration.[21]

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[20] Palmer, *Police and protest in England and Ireland*, pp 358-60.

[21] Margaret O'Callaghan, 'New ways of looking at the state apparatus and the state archive in nineteenth-century Ireland "curiosities from that phonetic museum": Royal Irish Constabulary reports and their political uses, 1879-91' in *Proceedings of the Royal Irish Academy, Section C: Archaeology, Celtic Studies, History, Linguistics,* Literature, civ, C, no. 2 (2004), pp 37-56, at pp 43, 55; John Cannon and Robert Crowcroft (eds), 'Irish Constabulary/Royal Irish Constabulary' in *The Oxford companion to British history* (2nd ed., Oxford, 2015), p. 499; Elizabeth Malcolm, 'Royal Irish Constabulary' in S.J. Connolly (ed.), *The Oxford companion to Irish History* (2nd ed., Oxford, 2004), p. 518; W.E. Vaughan, 'Ireland, *c.* 1870' in Vaughan (ed.), *A new history of Ireland*, v, pp 726-801, at pp 762, 766; Séamus Breathnach, *The Irish police: from earliest times to the present day* (Dublin, 1974), pp 36, 42, 45; Fennell, *The Royal Irish Constabulary*, p. 9; B.J. Griffin, 'The Irish police,

At the beginning of the nineteenth century the state, excluding the Post

Office, had little input into daily lives but its role in the supervision of society was to

change beyond recognition by the century's end, a process that was facilitated by

new communication technologies. The introduction and regulation of national poor

laws, the board of works, national schools, railways, and various labour laws

surrounding factories, needed a much larger and more intrusive, centralised state.

This process led to a significant reduction in the power of local government, were

grandees were replaced by officials responsible to London and Dublin. The police

force was not immune to these impulses and, given the growth of the state during the

course of the century, the desire for centralisation of its command functions would

only increase.[22] Thus, this chapter will demonstrate the role that telegraphy came to

play in this centralisation of the nineteenth-century state, in particular the R.I.C.

While devices such as the telegraph brought many benefits, its use must be

understood as one of an array of communication technologies that had developed

over the course of the nineteenth century. Steamships and locomotives had

considerably accelerated the speed at which commodities and information flowed.

This was particularly beneficial to the Post Office and the impact of the telegraph

must be understood in the context of a highly efficient, cheap, pan-British-isles

postal service.[23] By 1854, mail leaving the General Post Office (G.P.O.), Dublin, at

12.20 pm would arrive in London at 4.50 am the next morning, a journey time of

sixteen hours and thirty minutes.[24] This time was reduced considerably over the

period of this study; for example by 1897 mail that left Dublin at 7.10 pm reached

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1836-1914: a social history' (PhD thesis, Department of History, Loyola University of Chicago, 1991), p. 32; Palmer, *Police and protest in England and Ireland*, p. 361.

[22] Palmer, *Police and protest in England and Ireland*, pp 24-34, 356-7.

[23] Frank Cullen, 'Harbour, rail and telegraph: the Post Office and communication in nineteenth-century Dublin' in Neven Budak (ed.), *Towns and communication, volume 1, communication in towns* (Zagreb, 2009), pp 171-94, at pp 181-2.

[24] *Thom's Irish almanac and official directory of the United Kingdom of Great Britain and Ireland* (Dublin, 1854), pp 559, 588.

London at 6.15 am, a journey time of ten hours and fifty-five minutes. [25] This represented a revolution in communication; however these times were still considerable in comparison to the telegraph. The speed of mail deliveries outside of Dublin varied greatly, often depending on the presence of a train line. In the mid-nineteenth century, day mail leaving Dublin took five hours and forty-five minutes to reach Belfast, and seven hours and fifteen minutes to Cork.

The introduction of the 'penny post' in 1840 (the Post Office would deliver a letter anywhere within the United Kingdom for one penny) also contributed to the popularity of the mail service, which was delivering *c.* 59,000,000 letters in Ireland, by 1867. The low charge was retained despite the service's financial losses. These were in a large part due to the £80,000 per annum cost of packets (steamships) between the two islands. This loss was deemed acceptable in order to 'keep up rapid and secure communication between this country [Britain] and Ireland.'[26] Thus, there can be little doubt that the efficient and speedy mail service provided by the Post Office affected the frequency with which electric communication technologies were used by those seeking to govern and administer Ireland, and indeed the nature of that use. Conversely, despite the improvements in the mail service, the telegraph was still, by far, the fastest means of communication.

The telegraph, as a tool for the administration of Ireland, was to demonstrate its usefulness when the government was to assert its right to control the private companies' telegraph networks when the revolutionary Irish Republican Brotherhood (I.R.B.) or Fenian's, as they were popularly known, rebelled in 1867.

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[25] *Thom's official directory of the United Kingdom of Great Britain and Ireland* (Dublin, 1908), p. 1089; *Irish mail service (acceleration), copy of statement relative to the Irish mail service, showing (1) the present hours; (2) the hours proposed last year: and (3) the hours now decided on*, H.C. 1897 (35), lxxii, 2.
[26] Evidence of F.I. Scudamore, in *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, 132, 172.

The I.R.B. a secret, oath-bound society was formed in Dublin, 1858, by James Stephens. A year later a sister organisation the Fenian Brotherhood (the name 'Fenian' was applied to both organisations) was formed in the United States, primarily to supply financial and logistical support to its Irish counterpart. The Fenians believe in the use of force to overthrow British rule and establish an Irish republic.[27] Following years of procrastination by Stephens, it was the British authorities who finally acted. In 1865 they raided a number of known Fenian properties, including the premises of the society's newspaper, the *Irish People.* During the raid several senior Fenians were arrested, including Thomas Clarke Luby, John O'Leary and Jeremiah O'Donovan Rossa.[28]

Roger Barton has demonstrated the importance of co-operation between the government and the telegraph company to the success of these police operations. The Dublin raid was envisaged as one of a number of simultaneous arrests; however unforeseen circumstances meant that concurrent police raids in Cork were delayed by several hours. Unable to obtain a warrant from the Secretary of State, as required by legislation, the police requested that the British and Irish Magnetic Telegraph Company (B&I MTC) transmit no messages 'to Cork during that night.' The company agreed to this, thus supressing news of the Dublin raids and removing fears that Fenians in Cork would be alerted. This allowed the police to carry out their operations in due course.[29] This episode demonstrates the strong links between the B&I MTC and the state, and shows that the two would cooperate in the interest of security.

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[27] R.V. Comerford, 'Conspiring brotherhoods and contending elites, 1857-63' in Vaughan (ed.), *A new history of Ireland*, v, pp 415-30, at pp 418-9; R.V. Comerford, *The fenians in context: Irish politics and society, 1848-82* (2nd ed., Dublin, 1998), p. 110.

[28] R.V. Comerford, 'Gladstone's first Irish enterprise, 1894-70' in Vaughan (ed.), *A new history of Ireland*, v, pp 430-50, at p. 437.

[29] Letter from Thomas Larcom to H.T. Sanger, 27 September (BT archive, POST 81/106), in R.N. Barton, 'Construction of the network society: evolution of the electric telegraph 1837-1869' (Ph.D. thesis, Department of Science and Technology Studies, UCL), p. 243.

After a number of promised insurrections failed to materialise, Stephens was removed from power and replaced by Thomas J. Kelly. Kelly quickly made his way from the United States to Britain with a view to instigating a rebellion. By 1867 the Fenians were ready to act and an insurrection began on the night of 5 March. Over the course of the next few days there were a number of incidents in Counties Limerick, Tipperary, Clare, Louth and Queen's County (County Laois). Despite these initial disturbances, and continued operations against the rebels over the coming weeks, the insurrection quickly lost momentum.[30] The most significant instances of insurrection were in the southern province of Munster, where the telegraph played a critical role in the rebellion. Leading up to the insurrection the number of troops stationed in Ireland had been increased and placed at strategic points throughout the country in order to deal rapidly with any Fenian threat.[31]

The telegraph's usefulness in the management of troop movements and the transmission of information was realised by both sides. The Fenians hurried to cut telegraph lines to deny their use to the government, while the army was quick to use the technology for relaying information.[32] This in itself demonstrated how much the technology had inserted itself into daily life.

Unfettered access to the telegraph network and the need to deny its use to the Fenians were deemed so important that the government approved the temporary appropriation of the island's telegraph network. Fears of security leaks led to the dispatch of Thomas Kettle, superintendent of police at Scotland Yard, to Dublin, where he provided instruction on cryptography. Ciphered telegrams were to be used

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[30] Comerford, 'Gladstone's first Irish enterprise, 1894-70', pp 437-9.
[31] Ireland (power to suspend Habeas Corpus Act); telegraphic communications; budget (TNA, CAB 41/2/16).
[32] Pádraig Ó Concubhair, *'The fenians were dreadful men': the 1867 rising* (Cork, 2011), p. 101; *Irish Times*, 25 Jan. 1868.

for communication between Dublin Castle and the Home Office.[33] During this period the state used its statutory powers not only to deny the Fenians access to the telegraph system and to ensure the transmission of its own intelligence but also, on at least one occasion, to suspend the transmission of newspaper intelligence.[34]

In order to use the network successfully the state would be reliant on the co-operation of the private telegraph companies; in particular the staff of the B&I MTC, by far the bigger of the two companies operating telegraphs in Ireland (ch. II). The task was undertaken with vigour by the company's manager in Ireland, T.H. Sanger. To ensure the safe and efficient operation of the telegraph network the forces of the state and the B&I MTC worked hand-in-hand. Military detachments were placed in charge of telegraph offices throughout the affected districts, to ensure its availability to government forces.[35]

The transatlantic cable station at Valentia was an important communication node and the telegraph line between Killarney and the island was cut in two places by rebels. The island's residents voiced their preparedness to counter any Fenian threat to the cable and a squadron of the 12th Lancers was dispatched to Killarney 'for the purpose of protecting the telegraph line.' In addition, a force of military and police personal took charge of the telegraph station at Valentia, ensuring that no information regarding the insurrection was transmitted to America; thus denying news of the rebellion to American-based Fenians. The government also censured the transmission of newspaper reports relating to the disturbances.[36]

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[33] Evidence of Thomas Kettle, in *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, 85-6.
[34] Francis D. Finlay, proprietor of the *Northern Whig*, in *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill*, 106.
[35] *Irish Times*, 13 Mar. 1867.
[36] *Irish Times*, 3 Jan., 18, 19 Feb., 14 Mar. 1867.

With the army deployed to protect telegraph lines, the B&I MTC's clerks would open telegraph offices whenever they were required. The government was more than happy with the B&I MTC's efforts. Larcom, in a letter to T.H. Sanger, praised 'the zealous exertions of the various persons in the employment of the magnetic telegraph company who were called on to work at night and otherwise make extraordinary efforts to facilitate the business of the Government'. This enabled the telegraph to form an important part of the government's efforts to contain the rebellion by allowing the rapid transmission of orders. Larcom personally thanked Sanger for his 'exertions to execute whatever was required of you but also in procuring important information'. This no doubt allowed the government access to the most up-to-date information available in an extremely fluid situation.[37]

Throughout the disturbances the telegraph was also used to keep the government at Westminster informed of developments. On the 16 February 1867, the Earl of Derby was able—thanks to the telegraph—to inform the house of lords of occurrences that had happened in Ireland within the previous twenty-four hours.[38] Hence, the technology was of importance not just for the Irish administration in its efforts to deal with the rising but also played a role in transmitting intelligence to the imperial parliament in London. The events surrounding the Fenian uprising demonstrate that the government's policy of private telegraph development had not hindered its ability to commandeer the telegraph network as and when required. While it was rare that the state would go to this extreme, it could and did so when it was deemed necessary.

Thus, the state was to use the telegraph for a variety of purposes during the period of private ownership, ranging from confirming meetings to transmitting

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[37] Thomas Larcom to Thomas Sanger, quoted in Thomas H. Sanger to Earl of Mayo, 20 Sept. 1867, in Larcom papers: official correspondence, account of Irish telegraphs, 1868 (NLI, Ms. 7596).
[38] *Irish Times*, 16 Feb. 1867

important matters of state. While it did not have any direct control of the various telegraph companies, it felt that it could rely on the companies to fulfil its requirements. There was enough confidence in the security provided by ciphers for central figures in the Irish administration to use them for the transmission of important information. Finally, as was seen during the Fenian rising, the state could and did commandeer Ireland's telegraph network when needed.

Government and the nationalised telegraph network, 1870-1912

With the nationalisation of all the United Kingdom's inland telegraphs, 1870, the government gained control over a phenomenally powerful instrument for communication and control. While certain state agencies had used the telegraph prior to nationalisation, prohibitive costs deterred extensive use of the technology. In 1857, the cost of a telegram, to London, ranged from 5*s*. from cities and towns on Ireland's east coast, such as Dublin and Belfast, to 7*s*. 6*d*. from cities on the west coast, such as Cork and Galway.[39] Such charges were extremely expensive in comparison to the 1*d*. charge for posting a letter.

Following nationalisation there was a steady and significant increase in the state's telegraph usage. The military was a prominent user of the technology, for example the estimated cost of transmitting telegrams for the Horse Guard had increased rapidly from £434 in 1870 to £809 by 1873. The War Office also increased its use of private wires and the despatch of regular telegrams. Other branches of government also began to use private telegraph wires supplied by the Post Office,

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[39] *Return of companies incorporated by Act of Parliament or Royal Charter with power to establish and manage lines of electric telegraph,* H.C. 1860 (434), lxii, 13.

some from a non-existent base, for example the Admiralty, Board of Trade, and the Treasury.[40]

In 1876 the value of free messages transmitted by government departments had risen to £9,204 sterling per annum, an additional £16,809 sterling was spent on 'special wires, maintenance, extensions, and workings of telegraphs for the Admiralty, War Office, and other departments.'[41] By the following year, 1877, the Post Office was transmitting the equivalent of £13,845 of telegrams for government departments.[42] At 1*s.* per twenty-word telegram this was the equivalent of 276,900 average length telegrams or over 5.5 million words per annum. This figure was to peak at £78,764 in the year 1900-1 (fig. 8.2). Given the 1885 price reduction to 6*d.*, this was the equivalent of 3,150,560 standard telegrams or over 63 million words.

Thus, while the number of physical telegrams that survive is low, there was extensive use of the technology by the state throughout the nineteenth century. Telegraph nationalisation and the technology's usefulness to the administration and operation of various branches of government meant that the technology would be used continuingly and increasingly by the regime throughout the century (fig. 8.2).[43]

The new relationship between government departments and telegraphy was also seen in the network's physical infrastructure. Prior to nationalisation some telegraph lines had been constructed to provide communication to important arms of the state, such as the line connecting the Admiralty at Whitehall, London, to its naval base at Portsmouth.[44] However, the use of such lines was limited in this period, due,

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[40] *Report from the Select Committee on Post Office (telegraph department); together with the proceedings of the committee, minutes of evidence, and appendix*, H.C. 1876 (357), xiii, xxviii (henceforth cited as *Report on telegraph department*).

[41] Ibid.

[42] *Twenty-third annual report of the postmaster general, on the Post Office*, 201 [C 1863], H.C. 1877, xxvii, 24.

[43] *Account of sums expended on Post Office telegraph service by other depts., 1870-73,* H.C. 1875 (72), xlii, 3.

[44] Jeffrey Kieve, *The electric telegraph: a social and economic history* (Newton Abbot, 1973), p. 37.

in a large part, to the high cost of construction. In addition to these, the Post Office, the meteorological department (of the Board of Trade), and many other departments were to use the services of the private telegraph companies.[45] Following nationalisation the reconstruction of the telegraph network would accommodate the needs of state bodies to a greater extent.

Fig. 8.2 Value of free telegrams sent by government departments across the United Kingdom, 1870-1911
Source: *Fifty-ninth report of the postmaster general,* 93 [C 6997], H.C. 1912-3, xxxviii, 93.

Indicative of the increasing role that telecommunications was to play in governmental administration was the Post Office's reorganisation of Dublin's telegraph infrastructure. The vice-regal court was connected to the main telegraph network.[46] In addition, the chief secretary's office was to make increasing use of the telegram, ensuring that its telegrams would be free of charge.[47] Following nationalisation, the Post Office was also conscious of security considerations when reconstructing the telegraph system. For example, a new circuit connecting

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[45] Evidence of F.I. Scudamore, in *Index to the minutes of evidence taken before the Select Committee on the Electric Telegraphs Bill,* 212.
[46] *Report on telegraph department,* 262.
[47] Paper marked 3989, 15 March 1876 (NAI, CSORP/1877/11535).

Limerick, Ennis, Athenry and Galway would not only improve connectivity between these towns but it was also 'obvious that in cases of breakdown, or political disturbances at any point between Athenry and Dublin, it would be of immense advantage to Galway and the west country to have an alternative route by way of Limerick.' Thus, there is little doubt that the events of three years previous (the Fenian uprising) were still fresh in the minds of those designing the new telegraph network.[48] Indeed the state was willing to aid in funding the new system to improve communication with its agents, as it did in 1883 when it guaranteed a portion of the annual cost of a new telegraph line to Belmullet from the Constabulary vote.[49]

The improvements in telegraphic infrastructure taking place throughout the United Kingdom following nationalisation would greatly improve the technology's efficiency as a tool of government. While increased demands for the service led to delays for some customers, this did not apply to government telegrams, which were given priority over all other messages (ch. IV).

The Irish administration was to use the newly nationalised telegraph service for a range of mundane purposes, such as issuing instructions to solicitors.[50] The system would also come to play a role in informing the coastguard of shipwrecks.[51] The administration took advantage of its new relationship with the telegraph to deal with more pressing matters of security. The network was used to deal with the usual disturbances associated with the 12 July. The celebrations, and ensuing tensions between the two communities in Ireland, that surrounded the 12 July were a cause of apprehension and rapid access to information regarding these was of central concern

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[48] *Ireland, reports on circuit arrangements, Dublin, 1870* (London, 1871), p. 21, in Circuits' revision in the United Kingdom 1870-1871, p. 23 (BT archive, TCB 604/1, formerly POST 82/80).

[49] Extension of telegraph service to Belmullet, expenditure: annual grant from constabulary vote, for maintence, 1883 (N.A., T 1/14952).

[50] Letter from Dublin Castle to Edward Green, a solicitor at Newry, 18 May 1871 (NAI, CSORP/1871/12282).

[51] Letter from [illegible] to Major Thomas W. le P., Irish Office, London, [n.d.] (NAI, CSORP/1877/11535).

to the Dublin administration. Hence, it regularly requested that telegraph offices, in areas of potential disturbances, remain open.[52] Requests of this kind also extended to divisive election results, such as the town of Waterford in March 1870.[53]

The telegraph came to play an important role in expediting police work. An example of this was the case of Robert Samuel Bowden, who stood accused in 1881 of forging a £500 bill of exchange on the Provincial Bank of Ireland.[54] Under the name Samuel McFadden, he had made his way to the US but was arrested and detained for extradition back to the United Kingdom. However, before the extradition process could be completed the relevant warrants and documentation would have to be presented in New York. A number of telegrams were sent from Dublin to Armagh on 16 November 1880, requesting that files and a warrant relating to Bowden be sent to Dublin. These and a sub-constable, J. Maxwell, had, by the 18 November, made their way to the Home Office, London. Meanwhile, the R.I.C. headquarters in Dublin had received a telegram from the British legation, in Washington, enquiring if an officer had left with the necessary documentation. To this Dublin was able to reply that the officer had been at the Home Office and would 'proceed to New York with necessary documents to procure extradition of Bowden'. (Bowden was found guilty of the forgery at the Armagh assizes and sentenced to nine months).[55]

The Bowden episode is instructive to our understanding the impact of telegraphy on policing in Ireland. The ability of the R.I.C. based in Dublin to

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[52] Letter from the GPO, Dublin, 6 July 1872; reply from Thomas H. Burke, Dublin Castle, 9 July 1872 (NAI, CSORP/1872/9729); Letter from Anon to Anon, 24 August 1872 (NAI, CSORP/1872/12893)

[53] Letter from T.H. Burke, Dublin Castle, to GPO, Dublin, 3 March 1870 (NAI, CSORP/1870/4063).

[54] *Irish Times*, 16 Mar. 1881.

[55] Telegrams to sub-inspector, constabulary, Armagh, 16 Nov. 1880;; telegram from inspector general R.I.C. to Home Secretary, Whitehall, London, 19 Nov. 1880, in R.I.C. telegraph book containing carbon copies of messages sent from Dublin to County Inspectors relating to crime and agrarian matters, Nov. 10, to Dec. 15, 1880 (NLI, Ms. 16,192); *Belfast Newsletter*, 16, 17 Mar. 1881; Breathnach, *The Irish police*, pp 48-9.

communicate readily with London, Washington and its officers throughout Ireland expedited the extradition process. Thus, the technology allowed the R.I.C. to coordinate the activities of various officials not only in Ireland but also in Britain and the US. This simple process would have taken many months to complete prior to the introduction of telegraphy and was only possible due to the existence of the transatlantic cable.

The telegraph would soon be called upon for much more serious tasks than the relaying of the mundane information. An economic crisis was to engulf Ireland in the 1870s. By the winter of 1878-9 it had reached such lows that many feared scenes of destitution, not seen since the great famine, would be visited upon the rural population. In response to this Michael Davitt, a Fenian who had been incarcerated for seven years, began, in 1879, to organise a collective land movement for the protection of small tenants. Aided by other Fenians, and by the Home Rule M.P. Charles Steward Parnell, he formed the Irish National Land League in October 1879.[56]

The league attracted supporters from across Irish society, including many current and former Fenians despite the disapproval of the I.R.B. The Fenian members were to be the most combative element of the movement, which was responsible for the distribution much relief during this period. Indeed the state of the country deteriorated so badly that £800,000 of private and nearly £2.5 million of state charity was distributed in the period 1879-1882.[57] Irish tenants had little security of tenure and the central purpose of the league was to prevent evictions, by organising resistance to landlords. This brought the new organisation into direct

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[56] T.W. Moody, 'Fenianism, Home Rule and the Land War: 1850-91' in T.W. Moody and F.X. Martin, *The course of Irish history* (5th ed., 2011), pp 275-93, at pp 248-9; D.G. Boyce, *Nineteenth-century Ireland: the search for stability* (Dublin, 1990), pp 165-9.

[57] Cormac Ó Gráda, *Ireland: a new economic history* (2nd ed., Oxford, 1994), pp 251–3.

confrontation with not only the landed aristocracy but also the forces of the state, and was popularly known as the 'land war'.[58]

The government's response was to use exceptional powers of coercion in an attempt to suppress the organisation and its leaders.[59] However, it was to encounter serious levels of localised violence, particularly in the years 1880 to 1882 when reported levels of agrarian 'outrages' increased significantly.[60] In December of 1880 over 153 people, mostly landlords and their agents, were under police protection.[61] By 1882 the pressure on the police had become so great that several hundred soldiers were drafted in to supplement the R.I.C.'s efforts.[62] The telegraph was to play a central role in the relaying of information to, and orders from, R.I.C. headquarters. Due to the fluidity of the situation, where conditions on the ground where changing daily, the need for rapid communication was an essential part of the state's response.

While most of the telegrams sent by the R.I.C. over this period have been destroyed, a ledger containing telegram transcripts sent from R.I.C. headquarters in Dublin, covering the period 10 November to 15 December 1880, still exists.[63] If the transcription of telegrams was standard practise few have survived. A large number of the telegrams in this ledger were concerned with the movement of police officers. As such movements cost money, there is little doubt that a record of orders, in this case given by telegram as opposed to a more formal written form, was retained in case there was need to justify expenses. Thus, these telegrams overcame the 'bias of preservation', which normally saw telegrams destroyed, by containing information

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[58] Moody, 'Fenianism, Home Rule and the Land War: 1850-91', pp 249-50; R.V. Comerford, 'The land war and the politics of distress, 1877-82' in W.E. Vaughan (ed.), *A new history of Ireland, v: Ireland under the union, II, 1870-1921* (Oxford, 1996), vi, pp 26-51, at p. 46.
[59] Moody, 'Fenianism, Home Rule and the Land War: 1850-91', p. 251.
[60] Charles Townshend, *Political violence in Ireland: government and resistance since 1848* (Oxford, 1983), p. 151; T.W. Moody, *Davitt and Irish revolution, 1846-82* (Oxford, 1981), pp 420-1.
[61] Samuel Clark, *Social origins of the Irish land war* (Princeton, 1979), p. 308.
[62] Comerford, 'The land war and the politics of distress, 1877-82', p. 49.
[63] R.I.C. telegraph book containing carbon copies of messages sent from Dublin to County Inspectors relating to crime and agrarian matters, Nov. 10 to Dec. 15, 1880 (NLI, Ms. 16,192).

that was of potential use in the medium to long term. While the ledger book is a rather limited source to draw conclusion as to the use of telegrams during less critical periods, it still provides some clues.

The telegraph's primary purpose during the land war was the relaying of time-sensitive information. The ledger demonstrates that the postal service, alongside the couriering of reports by members of the RIC, was still the primary method of transmitting information. However, the telegraph was often used for the transmission of orders, while the postal service was used for the transmission of bulkier reports and files. Thus, the R.I.C. used the two services in conjunction with each other to achieve greater efficiency in the force's management.[64]

The ledger conveys a general preoccupation with the protection of people and property during the ongoing land war. The most significant use of telegraphy seems to have been in direct response to outbreaks of violence. For example, on 9 November 1880, shots were fired into the house of a Terence Boyle in County Kerry. The following day the R.I.C. county inspector was order by headquarters to 'place two men in Boyle's house to afford him personal protection.' The telegraph allowed those commanding the R.I.C. in Dublin to respond rapidly to outrages. It used the technology to station men for the protection of persons throughout the affected areas.[65] The most valuable contribution of the telegraph was the ability to liaise rapidly with officers in the field. It allowed the deployment of troops but also the countermanding of orders in response to a changing situation. Thus, orders to station

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[64] For examples, see telegram to sub-inspector, constabulary, Armagh, 16 Nov. 1880, telegram to sub-inspector, R.I.C., Athboy, 17 Nov. 1880, telegram to county inspector, R.I.C., Tralee, 24 Nov. 1880, in R.I.C. telegraph book containing carbon copies of messages sent from Dublin to county inspectors relating to crime and agrarian matters, Nov. 10, to Dec. 15, 1880 (NLI, Ms. 16,192).

[65] For example see, telegram to county inspector, constabulary, Sligo,11 Nov. 1880, telegraph to county inspector, Carlow, 19 Nov. 1880, telegram to sub-inspector, constabulary, Charleville, 2 Dec. 1880, telegram from inspector general to sub-inspector, constabulary, Middleton, 3 Dec. 1880, telegram from inspector general to R.I.C., Limerick, 4 Dec. 1880, in R.I.C. telegraph book containing carbon copies of messages sent from Dublin to County Inspectors relating to crime and agrarian matters, Nov. 10, to Dec. 15, 1880 (NLI, Ms. 16,192).

troops at locations could quickly be revoked if needed.[66] It also enabled R.I.C. headquarters to coordinate the activities of its officers with other bodies; for example prisons, to facilitate the movement of prisoners.[67]

The land war represented an extraordinary event in which the telegraph played an important role in the communication of orders. As outlined above, it allowed Dublin Castle to not only control various parts of the R.I.C. throughout the island but also to react rapidly to incidents. Thus, the telegraph reinforced the organisation's hierarchical command structure and permitted the centralisation of decision making in Dublin.[68] While the use of telegraphy in other periods is not as well documented, this does not signify that the technology was underutilised. The transmission of the equivalent of £78,764 worth of telegrams, in the year 1900-1, on state business demonstrates that the process of centralisation was aided by the telegraph and that its role extended beyond dealing with emergencies.

Popular perceptions of telecommunications and governance

As can be seen in the epigraph to this chapter, the perception prevailed that the telephone would herald a new era in the democratisation of politics. The telephone would give the public instant access to parliamentary debates and allow for greater democratic oversight of politicians. Given that early telephone companies levied an annual subscription charge rather than a fee per call, this type of transmission was financially viable for the subscriber. Indeed, such communication had been achieved

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[66] Telegrams to county inspector, R.I.C. Limerick, 27 Nov. 1880, 11.55 am, 12.20 pm, in R.I.C. telegraph book containing carbon copies of messages sent from Dublin to county inspectors relating to crime and agrarian matters, Nov. 10, to Dec. 15, 1880 (NLI, Ms. 16,192).
[67] Telegram from inspector general to county inspector, constabulary, Clonmel, 7 Dec. 1880, in R.I.C. telegraph book containing carbon copies of messages sent from Dublin to county inspectors relating to crime and agrarian matters, Nov. 10, to Dec. 15, 1880 (NLI, Ms. 16,192).
[68] Telegram to county inspector, constabulary, Tralee, 10 Nov. 1880, in R.I.C. telegraph book containing carbon copies of messages sent from Dublin to county inspectors relating to crime and agrarian matters, Nov. 10, to Dec. 15, 1880 (NLI, Ms. 16,192).

for the transmission of concerts.[69] However, there would be many technical difficulties in providing such a service. Firstly, this type of transmission required the use of considerable numbers of telephone lines. Secondly, transmissions from parliament would require the use of, extremely expensive, telephone trunk-lines. Finally, as anyone who has spent time sifting through parliamentary debates will inform you, the proceedings of parliament could be tedious and intolerably lengthy. Nevertheless, while the revolution in political oversight promised was not to materialise in the manner envisaged, the increased speed with which news was transmitted allowed for quicker access to intelligence concerning political affairs (ch. VII).

The public was quite aware that the advent of the telegraph challenged the manner and means of governance throughout the United Kingdom. An article in *Fraser's Magazine* in 1880 arguing for the abolition lord lieutenancy highlighted the impact of the telegraph on such positions. While the author felt that such an office had been needed to command the forces of the state in case of rebellion, such necessity no longer existed as 'the telegraph and the railway have cleared away this difficulty'.[70] The article continued that while the boards and civil servants in Ireland needed a head, provided in the form of the chief secretary, the need for an executive figure had been made redundant thanks to technological advances. Indeed the telegraph, alongside steam power, 'meant that a government … can make its influence felt from Downing-street very nearly as soon as from the Castle'.[71] Now any important political decisions could easily be made in London and orders rapidly transmitted to Dublin.

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[69] *Irish Times*, 2 May 1883.
[70] M.P., 'Ireland and England' in *Fraser's magazine*, issue 601 (1880), pp 77-8.
[71] Anon, 'Ireland' in *Fraser's magazine for town and country*, issue 420 (1864), p. 674.

Indeed, the same logic that was being employed to remove the symbols of British power was also being directed toward those agitating for home rule. During Grattan's Parliament, that is the last Irish parliament prior of the Act of Union 1800, communication between London and Dublin took two to three days. Those against the granting of home rule for Ireland argued that railways and improved and regular sailings had reduced this journey to about ten hours. Added to this, the advent of the telegraph meant that 'anything occurring in Ireland is known in London in five minutes.' These technological improvements, it was argued, made the need for an Irish parliament redundant.[72] While improvements in communication could hardly be the solution to the aspirations of those seeking home rule, this argument highlights the revolution that had been wrought over the course of the nineteenth century. New communication technologies had dramatically increased the ability of government at Westminster to directly control Irish affairs.

Uses of the telephone

Following its introduction, the telephone was to take its place alongside the telegraph as a tool for the administration of the state. Its use was to rapidly increase in the twentieth century (fig. 8.3), leading to a reduction in official telegrams from 1900 onward (fig. 8.2).

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[72] Powerscourt, 'Casual notes about Ireland' in *The nineteenth century: a monthly review* (April 1889), pp 527-538, at 534.
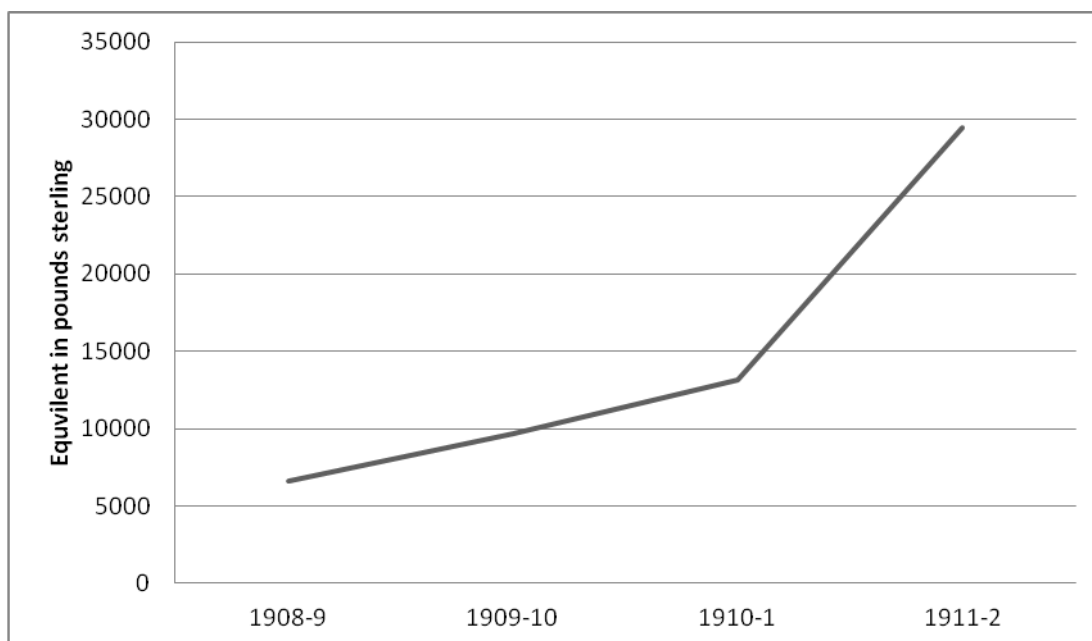
Fig. 8.3 Value of free telephone calls by government departments across the United Kingdom, 1870-1911
Source: *Fifty-ninth report of the postmaster general*, 93.

As Frank Cullen has demonstrated in his comparative study of nineteenth-century urban development in Dublin and Belfast, the telephone was used to connect important government offices in Dublin. Prior to this the telegraph had provided communication for many municipal bodies. For example, the Dublin Waterworks Committee made use of a telegraph line to connect the city to its reservoir at Roundwood, Co. Wicklow, allowing it to regulate its release of water.[73] Various organisations in Dublin and Belfast, including police, fire brigade and various corporation buildings were soon connected to the newly emerging telephone networks. These allowed rapid reaction by these services to events such as fires and crimes.[74] Despite increased telephone use by authorities across the British Isles, the technology's role in the administration of the state was limited. The telephone was

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[73] Entries dated 31 Dec. 1866, 14 Jan. 1867, 4 Feb. 1867 in minutes of the Dublin committee of the B&I MTC, p. 174, in Abstract of minutes (BT archive, TGF/1/1).
[74] Francis J. Cullen, 'Local government and the management of urban space: a comparative study of Belfast and Dublin, 1830-1922' (Ph.D. thesis in History, Department of History, NUI Maynooth, 2005), pp 221, 224-7.

extremely useful for communicating within urban areas connected to a central telephone exchange. However, as Ireland had few telephone trunk-lines, the telephone would not replace the telegraph as a tool that could satisfy the centralising impulses of the Irish regime.

Conclusion

As has been demonstrated, the advantages that the telegraph brought were rapidly realised by the state. It was quickly adopted as a means of transmitting intelligence and commands. Nevertheless, it was but one of an array of technologies, such as steamships and locomotives, which rapidly decreased communication times and aided the centralisation of the command functions of many public bodies. This was particularly relevant to Ireland where the existence of two separate and competing political and religious traditions meant that any decision was scrutinised for partiality. Due to this, decision-making for organisations such as the R.I.C.—which was wrought with pitfalls—was normally taken at Dublin Castle. The benefits of telegraphy were obvious; without the rapid communication they offered, officials in various parts of the country would have had much more independence of action. Thus, the telegraph, alongside the postal service, was essential for a centralising regime. Indeed, during incidents such as the Fenian disturbances and the land war this highly centralised command structure and coordinated response would not have been possible without the telegraph.

The technology was also essential for the routine operation of government. The structure of the Irish administration, split between London and Dublin, meant that access to the rapid communication provided by the telegraph was essential, particularly in light of the public's and newspaper industry's use of the service. Due

to this, the government was forced to rely on the telegraph to maintain a 'parity of intelligence.' The technology also provided the executive and parliament in Westminster with the most up-to-date intelligence during periods of disturbance.

The telephone was to replace the telegraph for much official communication between various municipal bodies, for example the police and fire brigade. However, the underdevelopment of Ireland's trunk lines limited its usefulness for long-distance communication. The importance of telecommunications was seen in the growth of its use by the state (fig. 8.2 & 8.3). In Ireland it was essential for the management of the island's administrative and security forces and became an indispensable tool of a centralising state.

Conclusion

Over the course of the long nineteenth-century, *c.* 1790-1912, Ireland was to undergo a communication revolution. Communication speeds both within Ireland and between it and the rest of the world, in particular Britain, changed beyond anything imaginable a century before. This transformation was due to the development and implementation of a number of communication and transportation technologies. Perhaps the two most important innovations of the period were the application of steam to transportation and of electricity to communication. The introduction of steam power to shipping and locomotives led to the compression of space and time, as the existing relationship between the two was altered by changing transportation technology. The development of optic and electric communication was to finally bring about the dissolution of this relationship, as information was separated from physical transportation for the first time.[1]

By studying the development, implementation and growth of these technologies over the long nineteenth century, this thesis has demonstrated that throughout their development these networked communication technologies were shaped by an array of social, economic, political, geographic and technological factors.

The first hurdle for inventors and promoters of these technologies was to market their innovations. The thesis has reinforced the idea that technological efficiency is not enough for a technology to become 'successful'. This was seen in the case of R.L. Edgeworth's 'tellograph' (chapter 1). The technical elements of the tellograph—telescopes and mechanical signalling apparatus—had long been available; indeed, Edgeworth himself had experimented with the application of such

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[1] Roland Wenzlhuemer, *Connecting the nineteenth-century world: the telegraph and globalisation* (Cambridge, 2012), pp 8-9.

technology to signalling as early as 1767. Thus, if the history of telegraphy followed a technological determinist path, that is to say if 'good' engineering alone was enough to secure the success of a technology, then it would have been well established prior to the 1790s. Instead, the development and success of a technology is a social phenomenon, 'society creates technology and decides if and how to use it.'[2] It was not simply enough to invent a technology that operated efficiently; instead inventors needed to create the perception of uses which their innovation could satisfy. In creating the perception of a market for their inventions, they would also have to fashion themselves as authoritative figures whose opinions and insight were invaluable.[3]

However, throughout the 1790s, the British state was unwilling to invest the considerable sums of money needed to maintain a modern, long-distance communication system. The short-term success of Edgeworth's tellograph was due to the extreme military tensions of the French revolutionary period and, once these had subsided, state support quickly evaporated. In future, the capital for such technologies would be provided by private investors, reliant for profit on the public. The need to create the perception of uses for communication technologies and the requirement to market these technologies was seen again with the introduction of the telephone to Ireland, in the late 1870s (chapter V). This revolutionary technology was initially seen as an amusing toy and telephone promoters used a range of public displays, lectures and exhibitions to prove its usefulness.

In all these cases the success of the technology was not guaranteed but rather relied on the ability of promoters to invent and maintain uses for their innovations. In

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[2] Lynne Hamill, 'The social shaping of British communications networks prior to the First World War,' in *Historical Social Research,* xxxv, no. 1 (2010), p. 261.
[3] Marsden and Smith, *Engineering empires: a cultural history of technology in nineteenth-century Britain* (Basingstoke, New York, 2005), pp 179-80.

Edgeworth's case, he was initially successful in this regard, marketing his invention as a tool for military communication against a threatened French invasion. But as this threat diminished the use for which he had fashioned his tellograph disappeared and the technology was ultimately a failure. In the case of the telephone, promoters were able to convince the public of the technology's use as a tool for internal communication. Significantly, the promoters of the telephone were also able to re-imagine the telephone as a networked technology, connecting multiple telephones via an exchange, and later as a long-distance communication device. Thus, the ability of promoters to imagine and convince others of a series of uses for their innovation was essential for its continued success.

The nature of the Irish economy and the importance of Britain to this economy was another important factor that shaped the development of electric telegraphy and telephony throughout the nineteenth century. This was amply demonstrated with the early development of the telegraph on the island. Despite the 'invention' of the telegraph in the 1830s and its expansion throughout Britain in the 1840s, by 1850 there was only five miles of telegraph line in Ireland. This thesis has argued that the central reason for this were the basic differences between the British and Irish economies.

The Irish economy was primarily focused on the export of agricultural and agri-industrial goods (that is processed agricultural goods) to Britain. Likewise, the only area to undergo significant industrialisation, the north-east of Ulster, was integrated into British markets. In comparison Ulster's connections with the rest of Ireland were much weaker. It was for these economic reasons that the eventual connection of Ireland to Britain, 1853, led to a massive growth in Irish telegraphy. The comparative economic situation of Ireland and Britain also explains the slow

growth of telephony in Ireland. Telephone use—given that it was marketed as a tool of urban business—would never reach British levels due to the underdevelopment of Ireland's industrial and commercial life. However, the importance of connectivity to Britain was again emphasised by the popularity of the cross-channel telephone cables.

The fact that the telegraph and telephone were initially promoted by private companies was a significant factor in their development in Ireland, and indeed across the United Kingdom. These companies were driven by profit and this was to have a significant impact on the development of telegraph and telephone networks. These companies would only lay lines where they were nearly certain of making a profit. For the telegraph, this was to restrict not only the amount of lines but also the number of telegraph offices on each. While there were some instances of towns supplementing the cost of telegraph offices, this policy was to restrict the growth of the network denying many access to the technology. The early telephone was to experience similar restrictions as companies sought to ensure profitability before expending capital on lines.

Nationalisation led to the antithesis of this policy; the state, driven by pressure from the electorate and the desire to use its monopoly to aid the economy, was to expend vast sums of money on the expansion of telegraphy and telephony. The case of the telegraph is quite striking. Nationalisation led to a massive improvement in the extent of the telegraph network, with more lines, wider geographic distribution, more offices, centralised offices in urban areas, longer opening-hours and a dramatic price reduction for transmission of both public and newspaper telegrams. However, such a service was only achieved by considerable and continued expenditure. The lesson is obvious: one can have a private service that

is costly to use, with poor service and perhaps, most significantly, has restricted geographic distribution or one can have an expensive public service that is cheap (to the consumer), efficient and reaches a wide proportion of the island, both in terms of population and geography. It is impossible to have both. Which service is provided is as much a political as an economic decision.

Another important, and often overlooked, factor that shaped Ireland's electric communication networks was its membership of the United Kingdom. It has long been recognised that the island's proximity to Britain has had a massive impact on its political and cultural history. As seen, already, this proximity was to have a significant impact on the nature of the Irish economy. In addition, the closeness of the two islands and their political union meant that much of the capital and impetus for the development of these technologies in Ireland came from Britain. This was perhaps most prominently seen in the establishment and operation of the English and Irish Magnetic Telegraph Company (E&I MTC). This company, primarily operated and financed from Manchester was responsible for most of Ireland's telegraph network from the 1850s until nationalisation in 1870.

The benefits of political union were also manifest in the radical reconstruction and upgrading of the Irish telegraph network following nationalisation. As this thesis has argued, the impetus for these developments came from Britain and not from Ireland, yet the new standards of telegraphy that were developed for the core of the United Kingdom were transferred wholeheartedly to Ireland. It is unlikely that Irish telegraphy would ever have advanced to this degree except for its membership of the United Kingdom. Thus, political union was to be one of the most important factors that shaped the telegraph over a large period of this study.

The importance of geography was seen in the development of Ireland as a node in transatlantic communication. The island's position as the most westerly part of the United Kingdom was to see substantial increases in its telegraph infrastructure with the construction of a telegraph line through the south of the island connecting the transatlantic terminus at Valentia to Wales. The failure of the 1858 cable also saw the growth of the island as a point for the delivery of transatlantic messages for further transmission by telegraph. Thus, geography was to be a significant factor in shaping the growth of electric communication in Ireland.

While it is easy for a thesis such as this to focus on the structural factors that influenced the development of long-distance communication technologies in Ireland over the course of the long nineteenth century, it is also important to remember the role of agency. Numerous social factors influenced the development of communication. The role of users was significant for the success, implementation and growth of these technologies. Edgeworth's tellograph would never have been tested if it were not for his own tenacity but also for the assistance of many political, military and scientific figures, for example John Foster. The importance of users was seen also in the case of the closure of Athy's telegraph station. Its perceived importance to the town meant that the Town Commissioners eventually agreed to subsidise the office in order to keep it open. Likewise, users such as merchants sought to employ the technology to gain advantage over, and to maintain a parity of intelligence with, their competitors.

Due to the networked nature of the telegraph and telephone, wayleaves, the right to lay wires were extremely important. The telegraph companies overcame this by acquiring rights to lay lines beside existing railways; however, this did restrict the growth of the network. In the case of the telephone, the inclusion of local notables in

the management of the Telephone Company of Ireland (TCI) is testimony to their role in securing such rights. The retention of these individuals on local boards following the purchase of the TCI by the National Telephone Company (NTC), 1893, is further evidence of their importance.

Perhaps the most obvious factor shaping the development of electric communication in Ireland was technology itself. Developing technology places many restrictions on users and shapes how, if, and when the technology is used. Likewise, these limitations shape the extent and nature of the network that develops to service this use. As already outlined, the growth of telegraphy in Ireland was driven by its connection to Britain. However, given that the first long-distance submarine cable, Dover to Calais, was only laid in 1850, the delay in the development of Irish telegraphy can be attributed to technological limitations as much as other factors. This technological restriction on long-distance communication was also to restrict the growth of the early telephone network. However, technological advancements also aided those seeking to improve the service provided. For the Post Office the development of duplex, quadruplex, and multi-plex transmission allowed for a massive increase in capacity without significant outlays of capital. Likewise, improvements in long-distance telephony were to drive the expansion of the technology and the desire for telephonic communication between Britain and Ireland was strong by the twentieth century.

Thus, by studying a number of technologies over the course of the long nineteenth century this thesis has been able to show that the success, implementation and growth of optic and electric long-distance communication technologies had much in common. The thesis has demonstrated throughout that the development of

these networked, communication technologies was shaped by an array of social, economic, political, geographic and technological factors.

While this study has sought to provide an insight into the social shaping of technological systems in Ireland during the long nineteenth century, it also demonstrated that these technologies had significant impacts, in two specific areas: the supply of intelligence to the newspaper industry and the governance and administration of Ireland.

Newspaper editors were quick to realise the importance of the electric communication. Prior to the telegraphic connection of Ireland and Britain, intelligence from London arrived in Ireland at the same time as London newspapers. This gave London newspapers a distinct advantage over the Irish press. The arrival of the telegraph disconnected information from physical carriers for the first time. Consequently, Irish newspaper editors would receive intelligence at nearly the same time as their London counterparts. This allowed them to print and distribute this intelligence before newspapers from London could arrive. Importantly, the publication of financial information from across the United Kingdom would force investors and merchants to purchase newspapers in order to maintain a parity of intelligence with their competitors.

The importance of telegraphy to Ireland's press was demonstrated in the strong showing of the island's newspaper proprietors at meetings called to discuss telegraph nationalisation. Likewise, Irish newspapers were well represented in the founding members of the Press Association, set up to replace the joint Intelligence Department of the private telegraph companies. The nationalisation of the United Kingdom's inland telegraphs, 1870, was to dramatically affect the news industry. Most importantly, the radical reduction in transmission rates for newspaper

intelligence led to an exponential increase in the volume of information received by the press. While this was to be a considerable drain on the Post Office, it was to be a boon for newspaper editors. The daily intelligence transmission received by newspapers was to increase from 4-6,000 words, prior to nationalisation, to 15,000 to 20,000, after.

The effect on newspapers was considerable: as access to information became more widespread journalists were forced to offer more analysis. Thus, 'journalism became the art of structuring reality, rather than recording it.'[4] In addition, the reduced transmission rates also allowed for reporters in the field to transmit reports back to their editors. Thus, the telegraph, alongside the massive improvements in the postal service, changed the operation and content of Irish newspapers forever.

The telegraph's potential as an important tool for the governance and administration of the state was recognised during the development of optical telegraphy. Indeed, even in France, which by the 1850s had over 550 optical telegraph stations, this was the primary function of the technology. Likewise, with the development and implementation of the electric telegraph many European states restricted use of the technology to state agents. While the United Kingdom's early electric telegraph network was to be developed by private enterprise, the British government carefully ensured that it could co-opt and commandeer telegraph lines whenever it desired. All charters granted to the private telegraph companies gave the state specific powers over them. The impact of these clauses was seen during the Fenian rebellion, 1867, when state forces took control of a number of telegraph stations. This allowed the administration to not only gather information and distribute orders quickly but also to deny these advantages to its enemy.

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[4] Anthony Smith, 'The long road to objectivity and back again: the kinds of truth we get in journalism' in George Boyce, James Curran and Pauline Wingate (eds), *Newspaper history: from the 17th century to the present day* (Beverly Hills, 1978), pp 153-171, at p. 167.

The use of the telegraph as a tool of state was demonstrated in the encouragement that it gave in the construction of a direct telegraph line between Britain and the south of Ireland to connect with steamers from North American and the transatlantic cable. This line, it was felt, would 'be employed by the govt. [sic] for transmitting its messages to Queenstown'.[5] Indeed, the substantial financial and logistical support provided for the 1857 and 1866 transatlantic cables was demonstration of the importance to the government of rapid communication with North America. However, while various state bodies were to make use of telegraphy, its use was limited by the high cost of the service.

State use was to drastically increase following nationalisation in 1870, as was the construction of telegraph extensions to service military and policing requirements. The integration of state forces and the telegraph was demonstrated during the Fenian rising and the Land War of the 1880s. During the Land War the telegraph was utilised to allow for the rapid transmission of intelligence and orders. Likewise, the connection of Ireland to the global telegraph network meant that official correspondence, that would have taken weeks prior to the introduction of telegraphy, could be carried out in hours.

Thus, the telegraph was to become a significant tool of state. It use was of importance for time-sensitive information, the postal service being used for other routine, and bulky, reports. While information transmitted could include the most mundane, such as the orders for state solicitors, it was in times of crisis that the technology became invaluable. The cases of the Fenian rising and the Land War demonstrated how the telegraph allowed the government to respond to a rapidly

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[5] G. Lewis to Lord Carlisle, in Letters and cuttings, Peel and Larcom, controversy between Peel, O'Donoghue and Fr Lavelle, telegraph line between London and Cobh, 1862 (NLI, Larcom papers, Ms. 7583).

changing situation and how it had become an integral part of the apparatus of government on the island.

This ground-breaking study of the introduction, implementation, expansion, successes and failures of long-distance communication technology in Ireland's long nineteenth century opens up numerous avenues of further investigation. Obvious areas include further research into the role that users and non-users of these technologies had on their development and the role that the National Telephone Company played in the early development of the telephone in Ulster. Above all, this thesis has demonstrated the importance of integrating technological developments into wider historical studies.

Appendix 1

Table of total number of telegraph messages transmitted from postal telegraph offices in England and Wales (excluding London), London, Scotland and Ireland. (N.B. in 1879 1,970,213 press messages were included in the returns).

Year ended	Number of Messages				
	England & Wales		Scotland	Ireland	Total
	Provinces	London			
1 April 1871	5,299,882	2,863,821	1,020,189	606,285	9,852,177
30 March 1872	6,594,590	3,612,772	1,388,434	878,000	12,473,796
29 March 1873	8,022,151	4,577,015	1,761,298	1,175,316	15,535,780
28 March 1874	9,233,854	5,254,547	2,009,893	1,343,639	17,821,530
27 March 1875	10,113,436	5,663,258	2,132,787	1,343,639	19,253,120
25 March 1876	10,843,268	6,390,573	2,287,359	1,145,180	20,973,380
31 March 1877	11,112,341	6,390,573	2,402,347	1,529,162	21,726,143
30 March 1878	11,242,609	6,849,909	2,490,776	1,588,489	22,171,783
29 March 1879	11,446,539	8,976,217	2,477,003	1,559,854	24,459,613

Source: Twenty-fifth annual report of the Postmaster on the Post Office, 197 [C 2405], H.C. 1878-9, xxi, 40.

Appendix 2

Dublin's first telephone directory
Source: List of exchange subscribers issued by the United Telephone Company 1880 (B.T. archive, TPC 1/1).

Appendix 3

Statistical tables showing the operations of the National Telephone Company in Ireland, 1893-1903

Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Ulster	12	22	951	158	1109
Belfast, Bangor, Carrickfergus, Comber, Lisburn, Larne, Lurgan, Newtownards, Portadown, Whitehouse, Whiteabbey and Doagh…					
Londonderry and Strabane	2	4	100	14	114
Dublin and South of Ireland	5	16	913	187	1100
Dublin, Rathmines, Kingstown, Drogheda and Dundalk					
Cork, Queenstown and Midleton	3	2	304	77	381
Limerick	1		116	17	133
Total 31 Oct. 1893	23	44	2384	453	2837
Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Ulster	12	22	1,011	186	1197
Belfast, Bangor, Carrickfergus, Comber, Lisburn, Larne, Lurgan, Newtownards, Portadown, Whitehouse, Whiteabbey and Doagh…					

Centre	No. of Exchanges	No. of Call Offices	No. of lines Exchange	Private	Total
Londonderry and Strabane	2	5	100	14	114
Dublin and South of Ireland	6	19	1045	219	1264
Dublin, Rathmines, Kingstown, Bray, Drogheda and Dundalk					
Cork, Queenstown and Midleton	3	3	343	84	427
Limerick	1		123	27	150
Total: 30 Jun 1894	24	49	2622	530	3152

Centre	No. of Exchanges	No. of Call Offices	No. of lines Exchange	Private	Total
Ulster	12	23	1025	185	1,237
Belfast, Bangor, Carrickfergus, Comber, Lisburn, Larne, Lurgan, Newtownards, Portadown, Whitehouse, Whiteabbey and Doagh…					
Londonderry and Strabane	2	5	101	15	116
Dublin and South of Ireland	8	19	1113	237	1350
Dublin, Rathmines, Kingstown, Bray, Killarney, Dundrum, Drogheda and Dundalk					
Cork, Queenstown and Midleton	3	3	370	91	461
Limerick	1		125	30	155
Total: 31 Dec. 1894	26	50	2734	558	3319

Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Ulster	12	24	1073	194	1267
Belfast, Bangor, Carrickfergus, Comber, Lisburn, Larne, Lurgan, Newtownards, Portadown, Whitehouse, Whiteabbey and Doagh…					
Londonderry and Strabane	2	5	100	21	121
Dublin and South of Ireland	8	19	1148	237	1385
Dublin, Rathmines, Kingstown, Bray, Killarney, Dundrum, Drogheda and Dundalk					
Cork, Queenstown and Midleton	3	3	385	94	479
Limerick	1		125	30	155
Total: 30 June 1895	26	51	2831	576	3407
Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Ulster	12	24	1127	205	1332
Belfast, Bangor, Carrickfergus, Comber, Lisburn, Larne, Lurgan, Newtownards, Portadown, Whitehouse, Whiteabbey and Doagh…					
Londonderry and Strabane	2	5	102	28	130

	No. of Exchanges	No. of Call Offices	Exchange	Private	Total
Dublin and South of Ireland	9	18	1164	249	1413
Dublin, Rathmines, Kingstown, Bray, Killarney, Dundrum, Drogheda and Dundalk					
Cork, Queenstown and Midleton	3	3	405	94	499
Limerick	1		136	28	164
Total: 31 Dec. 1895	27	50	2934	604	3538

Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Ulster	13	25	1192	226	1471
Belfast, Bangor, Carrickfergus, Craigavad, Comber, Lisburn, Larne, Lurgan, Newtownards, Portadown, Whitehouse, Whiteabbey and Doagh…					
Londonderry and Strabane	2	6	105	32	137
Dublin and South of Ireland	11	20	1222	249	1471
Dublin, Rathmines, Kingstown, Bray, Killarney, Dundrum, Blackrock, Ballsbridge, Dalkey, Drogheda and Dundalk					
Wexford	1		16		16
Cork, Queenstown and Midleton	3	3	452	95	547
Limerick	1		138	25	163

| Total: 30 June 1896 | 31 | 54 | 3125 | 627 | 3805 |

Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Ireland	13	24	1279	228	1507
Belfast, Bangor, Carrickfergus, Craigavad, Comber, Lisburn, Lurgan, Larne, Newtownards, Portadown, Whitehouse, Whiteabbey and Doagh…					
Londonderry and Strabane	2	6	123	23	155
Dublin, Rathmines, Kingstown, Bray, Killarney, Dundrum, Blackrock, Ballsbridge, Dalkey, Drogheda and Dundalk	11	21	1279	244	1523
Waterford and Wexford	2		27	1	28
Cork, Queenstown and Midleton	3	3	478	102	580
Limerick	1		152	32	184
Total: 31 Dec. 1896	32	54	3338	630	3977

Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Ireland	14	24	1375	231	1606
Belfast, Bangor, Carrickfergus, Craigavad, Comber, Lisburn, Lurgan, Larne, Newtownards, Portadown, Whitehouse, Whiteabbey, Doagh and Holywood…					
Londonderry and Strabane	2	6	133	34	167

Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Dublin, Rathmines, Kingstown, Bray, Killarney, Dundrum, Blackrock, Ballsbridge, Dalkey, Drogheda and Dundalk	11	21	1382	247	1629
Waterford, Wexford and Enniscorthy	3	2	60	6	66
Cork, Queenstown, Midleton and Blackrock	4	3	515	106	621
Limerick	1		176	35	211
Total: 30 June 1897	35	56	3641	659	4300

Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Ireland	15	26	1475	232	1707
Belfast, Bangor, Carrickfergus, Craigavad, Comber, Lisburn, Lurgan, Larne, Newtownards, Portadown, Whitehouse, Whiteabbey, Doagh, Holywood and Dunmurry…					
Londonderry and Strabane	2	6	141	33	174
Dublin, Rathmines, Kingstown, Bray, Killarney, Dundrum, Blackrock, Ballsbridge, Dalkey, Clontarf, Drogheda and Dundalk	12	22	1448	242	1690
Waterford, Wexford and Enniscorthy	3	2	75	13	88
Cork, Queenstown, Midleton and Blackrock	4	3	529	112	641

Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Limerick and Tralee	2		188	37	225
Total: 31 December 1897	38	59	3856	669	4525

Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Ireland	18	30	1564	246	1803
Belfast, Bangor, Carrickfergus, Craigavad, Comber, Lisburn, Lurgan, Larne, Newtownards, Portadown, Whitehouse, Whiteabbey, Doagh, Holywood, Dunmurry, Helen's Bay, Hillsborough, and Armagh…					
Londonderry and Strabane	2	6	155	34	189
Dublin, Rathmines, Kingstown, Bray, Killarney, Dundrum, Blackrock, Ballsbridge, Dalkey, Clontarf, Drogheda and Dundalk	12	22	1577	246	1823
Waterford, Wexford and Enniscorthy	3	2	85	16	101
Cork, Queenstown, Midleton and Blackrock	4	3	557	120	677
Limerick and Tralee	2		206	39	245
Total: 30 June 1898	41	63	4144	701	4838

Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Ireland	19	33	1688	252	1940
Belfast, Bangor, Carrickfergus, Craigavad,					

Comber, Lisburn, Lurgan, Larne, Newtownards, Portadown, Whitehouse, Whiteabbey, Doagh, Holywood, Dunmurry, Helen's Bay, Hillsborough, Armagh and Newry…

Londonderry and Strabane	2	6	163	36	199
Dublin, Rathmines, Kingstown, Bray, Killarney, Dundrum, Blackrock, Ballsbridge, Dalkey, Clontarf, Drogheda, Dundalk, Castleknock, and Howth	14	28	1675	244	1919
Waterford, Wexford, Enniscorthy and Clonmel	4	6	112	16	128
Cork, Queenstown, Midleton, Blackrock and Passage	5	4	588	130	718
Limerick, Tralee and Castleconnell	3	1	211	40	251
Total: 31 December 1898	47	78	4437	718	5155

Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Ireland	19	43	1855	257	2112

Belfast, Bangor, Carrickfergus, Craigavad, Comber, Lisburn, Lurgan, Larne, Newtownards, Portadown, Whitehouse, Whiteabbey, Doagh, Holywood, Dunmurry, Helen's Bay, Hillsborough, Armagh and

Newry…

Centre	No. of Exchanges	No. of Call Offices	Exchange	Private	Total
Londonderry and Strabane	2	5	177	33	210
Dublin, Rathmines, Kingstown, Bray, Killarney, Dundrum, Blackrock, Ballsbridge, Dalkey, Clontarf, Drogheda, Dundalk, Castleknock, Howth and Wicklow	15	24	1766	240	2006
Waterford, Wexford, Enniscorthy Clonmel and New Ross	5	6	132	17	149
Cork, Queenstown, Midleton, Blackrock and Passage	5	9	627	132	759
Limerick, Tralee, Castleconnell, Roxborough and Ennis	5	9	243	43	286
Total: 30 June 1899	51	96	4800	722	5522

Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Ireland	19	46	2271	394	2665
Belfast, Bangor, Carrickfergus, Craigavad, Comber, Lisburn, Lurgan, Larne, Newtownards, Portadown, Whitehouse, Whiteabbey, Doagh, Holywood, Dunmurry, Helen's Bay, Hillsborough, Armagh and Newry…					
Londonderry and Strabane	2	5	220	50	270
Dublin, Rathmines, Kingstown, Bray,	18	38	2048	353	2401

			No. of lines		
			Exchange	Private	Total
Killarney, Dundrum, Blackrock, Ballsbridge, Dalkey, Clontarf, Drogheda, Dundalk, Castleknock, Howth, Wicklow, Naas, Sligo, and Mullingar					
Waterford, Wexford, Enniscorthy Clonmel, New Ross and Kilkenny	6	8	156	30	186
Cork, Queenstown, Midleton, Blackrock and Passage West	5	10	710	162	872
Limerick, Tralee, Castleconnell, Roxborough, Ennis and Galway	6	10	279	66	345
Total: 31 December 1899	56	117	5684	1055	6739

Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Ireland	19	48	2375	388	2763
Belfast, Bangor, Carrickfergus, Craigavad, Comber, Lisburn, Lurgan, Larne, Newtownards, Portadown, Whitehouse, Whiteabbey, Doagh, Holywood, Dunmurry, Helen's Bay, Hillsborough, Armagh and Newry…					
Londonderry and Strabane	2	5	237	46	283
Dublin, Rathmines, Kingstown, Bray, Killarney, Dundrum, Blackrock, Ballsbridge, Dalkey, Clontarf,	18	35	2083	352	2435

Centre					
Drogheda, Dundalk, Castleknock, Howth, Wicklow, Naas, Sligo, and Mullingar					
Waterford, Wexford, Enniscorthy Clonmel, New Ross and Kilkenny	6	7	161	30	191
Cork, Queenstown, Midleton, Blackrock and Passage West	5	10	737	166	903
Limerick, Tralee, Castleconnell, Roxborough, Ennis and Galway	6	10	292	78	370
Total: 30 June 1900	56	115	5885	1060	6945

Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Ireland	18	46	2718	380	3098
Belfast, Bangor, Carrickfergus, Craigavad, Comber, Lisburn, Lurgan, Larne, Newtownards, Portadown, Whitehouse, Whiteabbey, Doagh, Holywood, Dunmurry, Helen's Bay, Hillsborough and Armagh					
Londonderry, Strabane and Brookhall	3	6	263	42	305
Dublin, Kingstown, Bray, Killarney, Dundrum, Blackrock, Ballsbridge, Dalkey, Clontarf, Drogheda, Dundalk, Castleknock, Howth, Wicklow, Naas, Sligo,	18	35	2266	374	2640

Centre	No. of Exchanges	No. of Call Offices	No. of lines Exchange	Private	Total

Mullingar and Newry

Centre	No. of Exchanges	No. of Call Offices	Exchange	Private	Total
Waterford, Wexford, Enniscorthy Clonmel, New Ross and Kilkenny	6	7	179	28	207
Cork, Queenstown, Midleton, Blackrock and Passage West	5	10	791	176	967
Limerick, Tralee, Castleconnell, Roxborough, Ennis and Galway	6	10	311	85	396
Total: 31 Dec. 1900	56	114	6528	1085	7613

Centre	No. of Exchanges	No. of Call Offices	No. of lines Exchange	Private	Total
Ireland	18	44	2833	380	3213
Belfast, Bangor, Carrickfergus, Craigavad, Comber, Lisburn, Lurgan, Larne, Newtownards, Portadown, Whitehouse, Whiteabbey, Doagh, Holywood, Dunmurry, Helen's Bay, Hillsborough and Armagh					
Londonderry, Strabane and Brookhall	3	6	279	43	322
Dublin, Kingstown, Bray, Killarney, Dundrum, Blackrock, Ballsbridge, Dalkey, Clontarf, Drogheda, Dundalk, Castleknock, Howth, Wicklow, Naas, Sligo, Mullingar and Newry	18	34	2428	367	2795
Waterford, Wexford, Enniscorthy Clonmel,	6	9	187	28	215

New Ross and Kilkenny					
Cork, Queenstown, Midleton, Blackrock and Passage West	5	10	798	174	972
Limerick, Tralee, Castleconnell, Roxborough, Ennis and Galway	6	10	311	88	399
Total: 30 June 1901	56	113	6836	1080	7916

Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Ireland	18	45	2975	385	3360
Belfast, Bangor, Carrickfergus, Craigavad, Comber, Lisburn, Lurgan, Larne, Newtownards, Portadown, Whitehouse, Whiteabbey, Doagh, Holywood, Dunmurry, Helen's Bay, Hillsborough and Armagh					
Londonderry, Strabane and Brookhall	3	6	295	46	341
Dublin, Kingstown, Bray, Killarney, Dundrum, Blackrock, Ballsbridge, Dalkey, Clontarf, Drogheda, Dundalk, Castleknock, Howth, Wicklow, Naas, Sligo, Mullingar and Newry	18	36	2578	363	2941
Waterford, Wexford, Enniscorthy Clonmel, New Ross and Kilkenny	6	8	193	26	219
Cork, Queenstown, Midleton, Blackrock and	5	10	811	170	981

Passage West

Centre					
Limerick, Tralee, Castleconnell, Roxborough, Ennis and Galway	6	10	322	87	409
Total: 31 December 1901	56	115	7174	1077	8251

Centre	No. of Exchanges	No. of Call Offices	No. of lines		
			Exchange	Private	Total
Ireland	17	49	3181	379	3560
Belfast, Bangor, Carrickfergus, Craigavad, Comber, Lisburn, Lurgan, Larne, Newtownards, Portadown, Whitehouse, Whiteabbey, Doagh, Holywood, Dunmurry, Helen's Bay and Hillsborough					
Londonderry, Strabane and Brookhall	3	6	312	46	358
Dublin, Kingstown, Bray, Killarney, Dundrum, Blackrock, Ballsbridge, Dalkey, Clontarf, Drogheda, Dundalk, Castleknock, Howth, Wicklow, Naas, Sligo, Mullingar and Newry	18	39	2690	371	3061
Waterford, Wexford, Enniscorthy Clonmel and New Ross	5	8	192	26	218
Cork, Queenstown, Midleton, Blackrock and Passage West	5	13	835	170	1005
Limerick, Tralee, Castleconnell,	5	9	322	81	403

Roxborough, and Galway

| Total: 30 June 1902 | 53 | 124 | 7532 | 1073 | 8605 |

| Centre | No. of Exchanges | No. of Call Offices | No. of lines | | |
			Exchange	Private	Total
Ireland	17	52	3659	379	4038
Belfast, Bangor, Carrickfergus, Craigavad, Comber, Doagh, Dunmurry, Helen's Bay, Hillsborough, Holywood, Larne, Lisburn, Lurgan, Newtownards, Portadown, Whiteabbey, Whitehouse					
Londonderry, Strabane, Brookhall	3	6	342	49	391
Dublin, Kingstown, Bray, Killarney, Dundrum, Blackrock, Ballsbridge, Dalkey, Clontarf, Drogheda, Dundalk, Castleknock, Howth, Wicklow, Newbridge, Naas, Sligo, Mullingar, Newry	19	32	3003	373	3376
Waterford, Wexford, Enniscorthy Clonmel and New Ross	5	6	206	33	239
Cork, Queenstown, Midleton, Blackrock and Passage West	5	13	890	168	1058
Limerick, Tralee, Castleconnell, Roxborough, and Galway	5	9	338	75	413
Total: 30 June 1903	54	118	8438	1077	9515

Centre	No. of Exchanges	No. of Call Offices	No. of lines Exchange	Private	Total
Ireland	17	55	3907	371	4278
Belfast, Bangor, Carrickfergus, Craigavad, Comber, Doagh, Dunmurry, Helen's Bay, Hillsborough, Holywood, Larne, Lisburn, Lurgan, Newtownards, Portadown, Whiteabbey, Whitehouse					
Londonderry, Strabane, Brookhall	3	6	363	51	414
Dublin, Kingstown, Bray, Killarney, Dundrum, Blackrock, Ballsbridge, Dalkey, Clontarf, Drogheda, Dundalk, Castleknock, Howth, Wicklow, Newbridge, Curragh, Naas, Sligo, Mullingar, Newry	20	31	3161	375	3536
Waterford, Wexford, Enniscorthy Clonmel and New Ross	5	7	316	39	255
Cork, Queenstown, Midleton, Blackrock and Passage	5	10	911	163	1074
Limerick, Tralee, Castleconnell, Roxborough, and Galway	5	11	350	78	428
Total: 31 December 1903	55	120	9008	1437	9985

Source: Compiled by A.J. Kirwan from Lists of telephone exchanges (B.T. Archives, TPF/3/1).

Appendix 4

Summary of expenditure on telephone construction in Irish urban centres from July 1911 to June 1912, with London added for comparative purposes

Ordinary Construction *l.s.d.*

Centre	July 1911	August 1911	Sept. 1911	Oct. 1911	Nov. 1911	Dec. 1911	Jan. 1912	Feb. 1912	March 1912	April 1912	May 1912	June 1912
London	10587.18.11	7783.9.5	5308.6.9	5271.2.5	7031.15.4	6428.6.2	4457.2.7	7052.14.9	6782.0.8	7.6.3	26.18.5	0.14.4
Belfast	231.12.10	181.9.6	182.14.8	57.13.3	244.4.2	266.10.2	251.15.4	398.0.4	$358^2.3^5.6^1$	341.5.1	480.1.7	329.17.5
London-derry	60.15.1	59.19.8	63.17.2	60.3.2	87.14.11	71.19.6	16.13.9	23.9.5	$11^1.12^1.11$	6.7.4	42.12.1	18.11.7
Dublin	587.1.9	571.1.2	468.8.1	545.6.4	831.2.2	208.17.11	459.11.11	758.16.0	753.18.9	517.11.7	683.8.6	488.11.11
Cork	65.3.3	103.3.8	51.10.7	39.2.3	95.9.5	92.9.10	$10^{10}.10.8$	83.12.3	102.15.3	101.8.6	52.14.5½	$56.16.11^1/_3$
Limerick	28.2.3	37.1.10	24.18.1	23.10.9	52.9.10	11.13.7	4.7.4	10.13.11	50.10.5	9.15.9	3.17.10	20.6.8
Water-ford	22.1.10	24.13.2	15.5.3	12.6.7	10.18.2	16.1.10	4.10.1	8.15.9	1.18.4	5.11.8	22.9.1	11.5.7
Total for UK	30278.9.1	29616.16.0	22747.9.0	23662.2.9	33167.7.3	41743.12.6	19127.18.3	30591.9.7	28333.18.2	16096.1.8	25996.10.8½	18764.10.8

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Exchange Construction *l.s.d.*

Centre	July 1911	August 1911	Sept. 1911	Oct. 1911	Nov. 1911	Dec. 1911	Jan. 1912	Feb. 1912	March 1912	April 1912	May 1912	June 1912
London	3828.11.6	323.6.8	1323.2.1	985.13.7	735.12.2	2256.12.0	202.4.4	490.19.9	250.14.9	0.0.10½	3.3.4	0.0.0
Belfast	2.17.5	9.10.6	11.2.6	0.11.11	96.9.4	25.4.6	10.1.0	4.16.2	15.14.4	10.12.2	83.10.7	13.12.1
London-derry	0.7.9			0.0.7		1.10.3	0.1.11					
Dublin	35.12.3	13.8.10	17.3.0	75.6.5	92.15.7	103.7.0	17.3.2	44.13.9	19.3.5	1.2.8	4.10.3	1.18.9
Cork	0.6.6	1.9.2	0.4.10		6.9.10	1.18.5	0.11.11		0.17.11	6.8.10		17.1.6
Limerick			5.0.0	0.15.0	2.1.0				0.0.6		0.5.0	
Waterford	8.10.0	1.18.8	0.5.0	3.0.8	0.15.3	0.2.8						
Total for UK	4822.9.10	1981.5.5	6803.17.0	3215.4.8	1422.19.0	1672.14.8	800.9.11	966.0.11	113.9.7	564.15.9½	1060.4.½	1279.9.11

Special Reconstruction *l.s.d.*

Centre	July 1911	August 1911	Sept. 1911	Oct. 1911	Nov. 1911	Dec. 1911	Jan. 1912	Feb. 1912	March 1912	April 1912	May 1912	June 1912
London				37.12.0								
Belfast												
London-derry												
Dublin		10.0.0										
Cork												
Limerick	2.19.11	9.15.5	9.16.3	5.9.3	2.16.1	2.16.10						
Water-ford												
Total for UK	2018.6.6	927.2.5	50.10.5	3066.4.3	82.5.3	7106.17.10						

Source: Compiled by A.J. Kirwan from Summary of accounts (B.T. Archives, TPF/4/5). (Note: Information has been extracted from returns for the whole of the United Kingdom. Figures in red appear to be added at a later date)

Appendix 5

Number of superior officers, clerks and messengers employed by the private telegraph companies, *c.* 1870

Name of Company	London			England & Wales			Scotland			Ireland			Total number employed by each company		
	Superior Officers	Clerks	Mess.	Superior Officers	Clerks	Mess.	Superior Officers	Clerks	Mess.	Superior Officers	Clerks	Mess.	Superior Officers	Clerks	Mess.
E&I TC	15*	467	212		818	450		98	56		70	41	**15**	**1453**	**759**
B&I MTC	6	97	64		303	244		84	55		163	70	**6**	**647**	**433**
UKTC	3	82	57		148	112		40	38				**3**	**270**	**207**
London &Provincial	1	144	66										**1**	**114**	**66**
1UPTC	2	3			4	2		11	4				**2**	**18**	**6**
Totals	**27**	**763**	**399**		**1273**	**808**		**233**	**153**		**233**	**111**	**27**	**2502**	**1471**

*This number includes five of the directors and an auditor.

Source: Redrawn by A.J. Kirwan from Arrangements for engineering staff from the telegraph companies acquired by the Post Office (BT archive, Post 30/200C).

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