GIRDLING THE GLOBE, NETWORKING THE WORLD

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A DISCOURSE ANALYSIS OF THE MEDIA REPRESENTATION OF NINETEENTH-CENTURY TRANSPORT AND COMMUNICATION TECHNOLOGIES IN VICTORIAN BRITAIN, 1838 – 1871

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Abstract

The nineteenth century witnessed the emergence of an unprecedented global transport and communication infrastructure in shape of steamships, railways, telegraph landlines and submarine cables and related engineering works, such as canals and railway tunnels. For various reasons, Great Britain could position itself at the centre of these new networks. Their ramifications on various spheres, such as global trade and the conduct of imperial policy, have received sustained scholarly attention. An in-depth analysis of the general public's reactions to the burgeoning infrastructure and the technologies involved, however, has not been carried out. Providing a discourse analysis of the various technologies' representation in Victorian print publications, this dissertation closes this gap. Focusing specifically on the newly established connections between Britain and India, on the one hand, and Britain and the United States, on the other, it investigates contemporaries' attitudes, perceptions and expectations and shows that in many ways, Victorian approaches anticipated postmodern analyses. For this, specific events have been selected and were monitored in a variety of British newspapers, magazines and other relevant printed material of the time. In so doing, this dissertation reveals that Victorian approaches towards technology reached beyond simplistic technological determinist beliefs and that their understanding of changing spatiotemporal arrangements was more sophisticated than the oft-quoted phrase of the 'annihilation of time and space' suggests. Further, it reveals the social and cultural frameworks into which these transport and communication technologies were embedded and illustrates the role they were given in the context of the formation of collective identities and interstate rivalries.

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1. Introduction

In the beginning of Jules Verne's by now classic tale of the journey *Around the World in 80 Days*, the novel's main character Phileas Fogg gets involved in a discussion about a robbery that has just occurred at the Bank of England. In this connection, the members meeting at the Reform Club discuss the investigators' chances of finding the thief and returning the stolen money. Andrew Stuart, one of Fogg's fellow card-players at the Club, points out that "the chances are in favour of the thief," for "[t]he world is big enough"[1] to find a place to hide. Fogg briefly replies that the world is no longer as big as it used to be. In the following discussion, Gauthier Ralph, another of Fogg's acquaintances, supports this assumption, pointing out that "[t]he world has grown smaller, since a man can now go round it ten times more quickly than a hundred years ago."[2] Fogg finally asserts that it is possible to circumnavigate the world in eighty days. He is supported by yet another gentleman who presents the following estimate taken from the *Daily Telegraph*:

> *From London to Suez via Mont Cenis and Brindisi, by rail and by steamboats…. 7.*
>
> *From Suez to Bombay by steamer …. 13 '*
>
> *From Bombay to Calcutta, by rail … 3 '*
>
> *From Calcutta to Hong Kong, by steamer …. 13 '*
>
> *From Hong Kong to Yokohama (Japan), by steamer …. 6 '*
>
> *From Yokohama to San Francisco, by steamer …. 22 '*
>
> *From San Francisco to New York, by rail …. 7 '*
>
> *From New York to London, by steamer and rail …. 9 '*
>
> *Total …… 80 days*.[3] [italics in original]

Despite his comrades' disbelief and doubts, Fogg adheres to his idea of proving the *Daily Telegraph*'s estimate right, and the wager is recorded on the spot.

As soon as Fogg and his servant Passepartout depart from London, the bet turns into a matter of public interest: Not only does the press discuss Fogg's chances of returning to London in time, with "[t]he Times, Standard, Morning Post, and Daily News, and twenty other highly respectable newspapers [scouting] Mr. Fogg's project as madness;

[1] Jules Verne, *Around the World in 80 Days* (Blacksburg: Wilder Publications, 2009 [1873]), 11.
[2] Ibid, 12.
[3] Ibid.

the Daily Telegraph alone hesitatingly [supporting] him;"[4] moreover, people would bet for or against Fogg "as if he were a race-horse."[5]

Adding to the suspense of the story is the fact that Fogg himself is suspected of being involved in the robbery. For this reason, Fogg and Passepartout are pursued by Detective Fix. During his journey, Fix avails himself of the telegraph in order to keep the authorities in London informed about his whereabouts or to announce Fogg's arrival at the next harbour up-front, for instance when he decided to "warn the English authorities, and signal the Rangoon before her arrival [in Hong Kong]. This was easy to do, since the steamer stopped at Singapore, whence there is a telegraphic wire to Hong Kong."[6]

Verne is often referred to as one of the founding fathers of science fiction,[7] yet when the book was first published in 1873,[8] his account of Phileas Fogg's journey around the world was highly topical in many respects. On the one hand, the nineteenth century witnessed the emergence of what may be referred to as "backbone of media modernity,"[9] in other words, the establishment of a global transport and communication infrastructure: after centuries in which oceanic passage had to be mastered in wooden ships of one kind or the other, propelled by either wind or sheer physical effort, the first wooden steamships crossed the Atlantic Ocean in the 1830s, not long after to be superseded by iron steamers. Oceanic transport had become not only faster, but also more reliable. Similarly, land transport underwent massive changes. In 1825, the first railway built especially for public transport was inaugurated in Great Britain. In the following decades, the railway network grew steadily, criss-crossing first Europe, then North America and other continents. Both sea and land transport were further improved and accelerated by means of no less ground-breaking engineering works: the Suez Canal and the Panama Canal (inaugurated in 1869 and 1914, respectively) rendered the circumnavigation of the African and South American continents unnecessary. Alpine tunnels, such as the Mont Cenis Railway Tunnel (opened in 1871, connecting France and Italy) or the Gotthard Tunnel between Switzerland and Italy (opened in 1882) made for facilitated and speedier access to the Mediterranean for travellers coming from

[4] Ibid., 17.
[5] Ibid., 18.
[6] Ibid., 60.
[7] Cf. Adam Roberts, *The History of Science Fiction* (Basingstoke: Palgrave Macmillan, 2006), xv and 129.
[8] The story had originally been published as a serial from November 1872 onwards; see footnote 13.
[9] Frank Hartmann, *Globale Medienkultur. Technik, Geschichte, Theorien* (Wien: WUV, 2006), 75. My translation. German original: "*Backbone* der Medienmoderne."[italics in original]

North and Central Europe.[10] Along with these developments, mailing times had been reduced drastically, yet global communication reached an entirely new quality with the 'invention' of electric telegraphy: the first electric telegraph line was inaugurated in Britain in July 1839. Throughout the century, the global network of landlines and submarine cables was gradually extended and – at least from a British perspective – reached a preliminary climax in 1902, when a submarine cable connecting British Columbia and New Zealand was completed and "all parts of the British Empire could (…) communicate by a cable network upon which the sun never set."[11]

What is more, the fact that, in the novel, Fogg's attempt is widely covered in the press indicates that questions of improving channels of transport and communication were issues the general public was not only aware of, but also took an interest in. Indeed, contemporaries were highly fascinated by the new transport and communication technologies and the opportunities they seemed to offer. Calculations similar to those presented in the novel were published in nineteenth-century newspapers in the aftermath of the opening of the Suez Canal,[12] and the circumstance that the novel was an immediate success certainly indicates that the public took to the topic.[13]

This dissertation therefore aims to provide a discourse analysis of the British media coverage of nineteenth-century transport and communication technologies and the emerging and/or burgeoning global infrastructure in the Victorian era. It examines the various attitudes, perceptions and expectations that existed among the general British public towards these transport and communication channels. Victorian press coverage of these technologies addresses many aspects, and therefore a wide range of topics will be taken up in the analysis, such as: in which cultural, social and historical frameworks

[10] In combination with steamships and railways, respectively, the canals and tunnels form large technological systems, which, according to Hughes, consist of both physical and legislative artefacts and organizations and "solve problems or fulfill goals using whatever means are available and appropriate," with "the problems [having] to do mostly with reordering the physical world in ways considered useful or desirable." In this study, I therefore subsume them under the term transport and communication technologies. Cf. Thomas Hughes, "The Evolution of Large Technological Systems," in *The Social Construction of Technological Systems. New Directions in the Sociology and History of Technology*, eds. Wiebe E. Bijker, Thomas P. Hughes, and Trevor J. Pinch (Cambridge, MA: MIT Press, 1989), 51-53.

[11] Daniel Headrick, *The Tools of Empire. Technology and European Imperialism in the Nineteenth Century* (New York: Oxford University Press, 1981), 160.

[12] Cf. Volker Dehs, *Jules Verne. Eine kritische Biographie* (Düsseldorf: Artemis und Winkler, 2005), 211.

[13] The public's fascination with the opportunities these new technologies offered becomes all the more apparent taking into consideration how the story of Fogg's journey around the world was received by its readers: When published as a serial in *Le Temps* from November 1872 onwards, the time of publication coincided with the period covered in the story; the boundaries between reality and fiction were blurred and 'real life' readership was just as captivated by Fogg's enterprise as the public in the novel. Cf. ibid., 218.

were the new means of transport and communication embedded? What were the ramifications contemporaries expected to accrue from these networks? How did they conceptualize changing relations of time and space? And were these technologies thought to bear witness to seemingly typically British qualities? An examination of these media representations therefore allows for deeper insights into Victorian mindsets and mentalities in general.[14]

Conventional accounts of the expectations towards technology in the nineteenth century tend to veer between the extremes of an overoptimistic belief in progress, on the one hand, and a pronounced, if not profound fear of the emerging technological juggernaut, on the other. Both accounts are based on the fact that technological determinist beliefs are nowadays usually deemed to have "become dogma by the end of the [nineteenth] century."[15] These apparently typical, technological determinist beliefs (whether positive or dystopian) will be traced in this analysis of Victorian media coverage. Examining the way these technologies were represented in nineteenth-century newspapers, magazines and other printed material, however, I will also show that these conventional accounts are largely insufficient and misleading.[16] It will be demonstrated that Victorian approaches towards technologies in general were more complex and multilayered than is widely assumed and went beyond such determinist and naive ideas. In fact, I argue that they in various ways anticipated postmodern sociological perspectives and therefore illustrate that (as Krueger formulated aptly, although in a different context), "[n]o matter how vociferously we protest our postmodern condition, we are in many respects post-Victorians."[17]

[14] As Rössler points out, analysis of media coverage is only to a certain extent able to take into consideration the ways in which readers reacted to the reporting under scrutiny (the only exception being letters to the editor). Media coverage is thus not necessarily a generally valid representation of reality. Rössler does, however, also point out that in particular in a historical context, it can be assumed that media coverage provides insights into social reality of the time. Cf. Patrick Rössler, *Inhaltsanalyse* (Konstanz: UVK, 2005), 31f.

[15] Merritt Roe Smith, "Technological Determinism in American Culture," in *Does Technology Drive History? The Dilemma of Technological Determinism*, ed. Merritt Roe and Leo Marx (Cambridge, MA: MIT Press, 1995), 7.

[16] A notable exception is Tamara Ketabgian's *The Lives of Machines*, in which she engages in a postmodern rereading of Victorian technoculture and stresses aspects of hybridity and mingling; Tamara Ketabgian, *The Lives of Machines: The Industrial Imaginary in Victorian Literature and Culture* (Ann Arbor, Mich.: University of Michigan Press, 2011).

[17] Christine L. Krueger (ed.), introduction to *Functions of Victorian Culture at the Present Time* (Athens: Ohio University Press, 2002), xi.

As Mussell has pointed out, the press is an indispensable vehicle for understanding the nineteenth century.[18] The reason for this is primarily that in the course of the nineteenth century, newspapers, magazines and other press products became part of everyday life and were more widely read than ever before. An analysis of newspapers and magazines published at different places and aimed at different strata of society was therefore deemed the best way to gain insights into the attitudes and perceptions of the general public (rather than focusing on the ways in which intellectual circles or the business community responded to them).[19] An analysis of press coverage has the additional benefit that there is a large amount of source material available, covering a long period of time. This enables us to draw comparisons over time and between the various technologies and can help us comprehend if, or indeed, how, attitudes and perceptions differed significantly or changed over time.

It is by no means coincidental that, in Verne's novel, Fogg's journey begins and ends in London. Similarly, the focus on printed material published in nineteenth-century Britain has not been chosen arbitrarily. Rather, in the present context, Victorian Britain is of peculiar interest and significance, in large part because, as previously mentioned, in the course of the nineteenth century transport and communication technologies improved decisively. The exchange of people, goods and information could now be carried out in a fraction of the time needed earlier and with a previously unknown reliability and predictability (at least for those who, like Phileas Fogg, could afford to make use of, and had access to these media). It is therefore not surprising that Osterhammel suggests mobility as one of the key terms to epitomize the nineteenth century:

> Mobility was no longer only a way of living pursued by nomadic populations, an emergency state of being of refugees or displaced people, or a requirement for breadwinning for seamen. It had become a dimension of organized social life, whose pace differed from that of small-scale everyday life.[20]

In particular the period from 1830 till the end of the nineteenth century (roughly equivalent to Victoria's reign) is therefore often referred to as the first information

[18] Cf. James Mussell, *The Nineteenth-Century Press in the Digital Age* (Basingstoke: Palgrave Macmillan, 2012), 1.

[19] As will be seen, the publications chosen for analysis are among the most widely read of the period under observation, which is why it seems appropriate to refer to their readership as the 'general public' or 'contemporaries'.

[20] Jürgen Osterhammel, *Die Verwandlung der Welt. Eine Geschichte des 19. Jahrhunderts* (Munich: C.H. Beck, 2004), 1291. My translation. German original: "Mobilität war nun nicht mehr nur eine Lebensweise nomadischer Populationen, ein Notzustand von Flüchtlingen und Vertriebenen oder die Bedingung des Broterwerbs von Seeleuten. Sie war eine Dimension organisierten gesellschaftlichen Lebens geworden, deren Tempo sich von dem des kleinräumigeren Alltags unterschied."

age.[21] What is more, on a global level, Great Britain held a special position within this infrastructure and could "[establish] itself securely as the information hegemon by the late 1800s."[22] There are a variety of reasons for this, the fact that Britain as a trading state and imperial power depended on speedy and reliable means of transport and communication certainly being pivotal. It can therefore be safely assumed that the British press covered these technologies more extensively and in more detail than, for instance, French, American or German newspapers (although, as we will see later, analyzing the media representation of the various transport and communication technologies in these countries would certainly also yield very interesting results).

As this study is concerned with *perceptions* of transport and communication technologies – rather than with, for instance, their 'invention' or the scientists, engineers and statesmen involved in this process – it does not fit in any of the 'classic' categories of technological history.[23] Instead, my approach to the topic conforms to Marsden and Smith's claim that "the study of technology in history is part of the study of *culture* more generally."[24] [italics in original] They define cultural history as "the study of the construction (or production) and the dissemination (or reproduction) of meanings in varying historical and cultural settings,"[25] and it is this area that this dissertation seeks to make a contribution to. As has been hinted, it can thus help us grasp Victorian mindsets in a wider context, for instance concerning the ways in which contemporaries reconciled scientific progress with traditional Christian belief, or in understanding the role technology and industrialization played for European self-conception. What is more, given that we are living through equally radical changes (the Victorians witnessing the so-called communication revolution, the transformations from the late twentieth century onwards being referred to as the digital revolution), an examination of attitudes towards transport and communication technologies in this first information age will almost inevitably bring up the question of how we today respond to the respective media. In the

[21] Cf. Richard Menke, *Telegraphic Realism. Victorian Fiction and Other Information Systems* (Stanford, CA: Stanford University Press, 2008), 9; Miles Taylor and Michael Wolff (eds.), *The Victorians Since 1901. Histories, Representations and Revisions* (Manchester: Manchester University Press, 2004), 8.
[22] Peter J. Hugill, *Global Communications since 1844. Geopolitics and Technology* (Baltimore: John Hopkins University Press, 1999), 28.
[23] Marsden and Smith distinguish three types of histories of technology: firstly, popular histories of technology, producing progress- and triumph-oriented narratives that "comfort rather than challenge;" secondly, economic and business histories which engage in quantitative questions; and thirdly, what they call antiquarian histories of technology, revolving around details of design and construction. Cf. Ben Marsden and Crosbie Smith, *Engineering Empires. A Cultural History of Technology in Nineteenth-Century Britain* (Basingstoke: Palgrave Macmillan, 2007), 1f.
[24] Ibid., 5.
[25] Ibid., 4.

broadest sense, therefore, this dissertation also pursues the question of technology's place in, and contribution towards twenty-first century society.

In the following section, I will further elaborate on the relevance of this approach towards the study of technology in history and the advantages it has to offer. To start with, however, I will briefly contemplate why the study of nineteenth-century technologies of transport and communication is of particular relevance at this moment in time.

1.1 Relevance and Purpose of Dissertation

As an academic discipline, history – although evidently devoted to the study of the past – is inevitably and inextricably always engaging with the present, for, as the late Eric Hobsbawm pointed out, "where we stand in regard to the past, what the relations are between past, present and future are not only matters of vital interest to all: they are quite indispensable."[26] He does indeed admit that "[s]ince industrialization began, the novelty of what every generation brings is much more striking than its similarity to what has gone before,"[27] but nonetheless emphasizes that the past is after all a most significant benchmark in order to make sense of present-day events. Furthermore, he sets forth that looking backward is essential for anyone wanting to 'forecast' the future, as far as this is possible, for "[h]istory alone provides orientation and anyone who faces the future without it is not only blind but dangerous, especially in the era of high technology."[28]

With Hobsbawm's contemplations on the significance of the study of the past in mind, we can identify several rationales for which the study of the Victorian ideas of and approaches towards transport and communication technologies is important. The first reason revolves mainly around the aspect of globalization and the corresponding research interest of historians: hardly surprising, trends within the academic discipline of history do not emerge arbitrarily, but are shaped and informed by current political, social or cultural conditions and developments (just think of how, in the nineteenth century, the emergence of nation states was accompanied by attempts to create national

[26] Eric Hobsbawm, *On History* (London: Weidenfeld and Nicolson, 1997), 24.
[27] Ibid., 26.
[28] Ibid., 52.

histories).[29] Given the fact that we live in a deeply globalized world (globalization is here defined as "*changes in the density of international and global interactions relative to local or national networks*"),[30] [italics in original] it does not come as a surprise that historians have come to 'cast off' the limitations the nation state as an analytical 'box' within which to think has imposed on them.[31] Instead, approaches interested in "communication, contacts and transfers between world regions"[32] (world or global history) or "processes of border crossing"[33] (transcultural history) have become increasingly popular.[34] An integral part of studying the history of contacts, transfer or border crossings of whichever kind is the study of the carriers along which these processes unfolded. It is in this context that nineteenth-century transport and communication structures are of paramount interest: Although studies such as Tom Standage's *The Victorian Internet*[35] are oversimplified and misleading in the sense that they present the electric telegraph network as a direct precursor of today's communication and information infrastructure,[36] there are several reasons for which studying and comparing the underlying structures and functions of the two can turn out insightful and help us understand current globalization processes; both, for instance, contributed to a closer integration of world markets and changed the way news are gathered and reported.[37] In a similar manner, studying contemporaries' *attitudes* towards these global networks of transport and communication and their *reactions* to the

[29] Cf. Ron Robin, "Historians and the Nation State," in *The Palgrave Dictionary of Transnational History*, eds. Akira Iriye and Pierre-Yves Saunier (Basingstoke: Palgrave Macmillan, 2009), 486; Jürgen Osterhammel, "Imperien," in *Transnationale Geschichte: Themen, Tendenzen und Theorien*, eds. Gunilla Budde, Sebastian Conrad, and Oliver Janz (Göttingen: Vanderhoek and Ruprecht, 2006), 56.

[30] Christopher Chase-Dunn, Yukio Kawano and Benjamin D. Brewer, "Trade Globalization Since 1795: Waves of Integration in the World-System," *American Sociological Review* 65, no. 1 (2000):78.

[31] Osterhammel, however, highlighting the manifold motives behind national historiography and pointing to the many newly emerging nation states in search of what he calls a "usable past," is nonetheless confident that the nation state will remain a most crucial instrument in the historian's tool box; cf. Osterhammel, "Imperien," 56.

[32] Roland Wenzlhuemer, "Globalization, Communication, and the Concept of Space in Global History," in *Historical Social Research – Historische Sozialforschung. Global Communication: Telecommunication and Global Flows of Information in the Late 19th and Early 20th Century*, ed. Roland Wenzlhuemer (Cologne: Center for Historical Social Research, 2010), 21.

[33] Madeleine Herren, Martin Rüesch and Christiane Sibille, *Transcultural History: Theories, Methods, Sources* (Berlin: Springer, 2012), 6.

[34] Other approaches with similar objectives are, for instance, world history, entangled histories or transnational history; cf. Akira Iriye and Yves-Pierre Saunier, *The Palgrave Dictionary of Transnational History* (Basingstoke: Palgrave Macmillan, 2009), xviii.

[35] Tom Standage, *The Victorian Internet: The Remarkable Story of the Telegraph and the Nineteenth Century's Online Pioneers* (London: Weidenfeld and Nicolson, 1998).

[36] As Wenzlhuemer highlights, the nineteenth-century electric telegraphy network and today's internet differ, among other things, in terms of public access, transmission costs and the content that could be transmitted. Cf. Roland Wenzlhuemer, *Connecting the Nineteenth-Century World: The Telegraph and Globalization* (Cambridge: Cambridge University Press, 2013), 7f.

[37] Cf. ibid, 9.

resulting integration processes (rather than underlying structures and functions only) can help us understand the way we think about and respond to similar processes today. How, for instance, Victorians made sense of changes in the relation between time and space brought about by the electric telegraph and the dematerialization of information flows, is a highly topical question at the beginning of the twenty-first century.

But studying *perceptions* of transport and communication technologies is necessary and relevant on a more general level, reaching beyond aspects of globalization. As Mikael Hård and Andrew Jamison have aptly pointed out, "[t]echnological artifacts and scientific knowledge have become increasingly constitutive of what we do and what we think."[38] This is best understood when we look at the many ways in which science and technology 'permeate' the human body (in shape of, for instance, critical-care medicine, genetic engineering or so-called wearable computers, such as the newly developed Google Glass) or how we use technological devices as medium through which we perceive the world and participate in events at a local, national and global level (just think of the ways in which people in their everyday life base their decisions on the information provided by means of a smart phone, for instance when using it as a mobile navigation device, or how social networking platforms such as Facebook and Twitter enable us to support pressure groups fighting for their course at the other end of the world). In light of such developments, the well-established subject-object dichotomy is an anachronism that can no longer be deemed an adequate approach in order to conceptualize the multidimensional relations and interactions between humans and technology. It is therefore hardly surprising that sociologists have developed new perspectives, focusing on the actual usage of technologies and highlighting aspects of hybridity (I will discuss these approaches in more detail at a later point).

Similarly, history as an academic discipline also needs to find new ways of dealing with technology-related questions: traditional approaches, in particular those focusing on the 'supply side' (that is, on innovation and inventions, revolving mainly around the idea of progress) are inadequate in the sense that they, *a priori*, have a limited geographic, temporal and social scope.[39] In terms of transport and communication technologies, this means that they concentrate largely on, for instance, the launch and maiden voyage of a

[38] Mikael Hård and Andrew Jamison, *Hubris and Hybrids. A Cultural History of Technology and Science* (New York: Routledge, 2005), 3.
[39] Cf. David Edgerton, "From Innovation to Use: Ten Eclectic Theses on the Historiography of Technology," *History and Technology* 16, no. 2 (1999):114.

new type of ship, the details of its construction and the extent to which it is therefore superior to its predecessors, or the economic benefits deriving from this new means of transport. Certainly, such studies are interesting and important in their own right, yet as Hård and Jamison highlight, "[f]or historians, the task is to provide a richer account of the past, to develop narratives that bring out our multifarious interactions with technology and science."[40] Studies as the ones mentioned above all too often provide nothing but fairytale-like 'happily ever after'-accounts, assuming that, once a technology has been introduced, it is just 'there' and 'does' what it was initially supposed to do. In this case, neither processes of decline and disappearance, nor the cultural and social contexts in which a particular technology is embedded, are taken into consideration. David Edgerton thus proclaims that, rather than restricting themselves to innovation-oriented perspectives, historians should turn to what he calls "technology in use."[41] This approach, he argues, allows for an entirely different picture of the development of technologies and their impact. What is more – and most important in the context of this study – is the fact that it enables us to reconsider the roles we attribute to technology, to trace their historical roots and to "undermine most contemporary claims to novelty."[42]

Three examples (two of which I will come back to at a later stage) can help us understand this better: Edgerton himself points to the fact that various technologies have traditionally been expected to bring about universal peace. It was repeatedly assumed that the efficacy of new technologies of destruction – be it battleships, bombing aircrafts or nuclear bombs, just to name a few – would force statesmen to seek other solutions than military conflict and would therefore foster world peace. Moreover, transport and communication technologies, such as steamships, railways, the electric telegraph and the telephone, were also expected to bring about universal peace: as they enabled people to communicate faster, if not instantly, it was assumed that misunderstandings, which frequently resulted in armed conflict, could be avoided.[43] The latter aspect is particularly interesting in the context of this study: Taking into consideration that the internet was allegedly nominated for the Nobel Peace Prize – the rationale of the supporters also being that it fostered international communication and global

[40] Hård and Jamison, *Hubris and Hybrids*, 7f.
[41] Edgerton, "From Innovation to Use," 112.
[42] David Edgerton, *The Shock of the Old: Technology and Global History since 1900* (London: Profile Books, 2006), xvi.
[43] Cf. ibid.

exchange[44] – it becomes obvious what Edgerton means when he sets forth that "[h]istory reveals that technological futurism is largely unchanging over time. Present visions of the future display a startling unselfconscious lack of originality."[45]

Another example is to be found in Regine Buschauer's study on *Mobile Räume* ('Mobile Spaces'), in which she investigates the discourses on spatial transformations resulting from new technologies of transport, communication and information (more precisely, the telegraph, railways, the internet and mobile telephony).[46] Buschauer illustrates that the topos of space being 'annihilated', 'overcome' or 'lost' has been drawn upon repeatedly whenever new transport, communication and information technologies confounded previously valid notions of time and space. In this context, she emphasizes the remarkable similarities between the discourse on the changes brought about by the electric telegraph and the digital media of the twenty-first century. She consequently (and in concert with Edgerton) points out that the changes we have been experiencing from the late twentieth century onwards and which we often consider to be new and unprecedented (and therefore typical of the so-called information age) in fact have their historical predecessors.[47]

A third example I would like to mention here is the opening of the Channel Tunnel: six years after construction works had commenced and around three and a half years after French and British workers had joined their respective halves of the submarine tunnel, the 'Chunnel' connecting England and France between Folkestone and Calais was completed. At the inauguration ceremony on 6 May 1994, Queen Elizabeth II described the tunnel as "one of the world's great technological achievements," and further remarked that it "stands as a monument to the joint efforts and talents of [the] engineers, technicians and construction workers."[48] As expected, the official opening of the tunnel received wide coverage in the international press; the *Guardian*, for instance, considered it a "hi-tech triumph of ideology,"[49] the *Chicago Tribune* declared it to be

[44] "Internet for Peace, Press Release No. 1," last viewed 24 August 2013, www.internetforpeace.org/mediadetail.cfm?pressid=1.
[45] Edgerton, *Shock of the Old*, xvi.
[46] Regine Buschauer, *Mobile Räume: Medien- und Diskursgeschichtliche Studien zur Tele-Kommunikation* (Bielefeld: Transcript Verlag, 2010).
[47] Cf. ibid., 320.
[48] Queen Elizabeth II, "Speech at the Opening of the Channel Tunnel" (Cheriton, 6 May 1994).
[49] Francois Came, "Two nations linked by blood, sweat and toil," *The Guardian*, 6 May 1994, last viewed 3 December 2013, http://www.guardian.co.uk/travel/1994/may/06/railtravel.wonders.channeltunnel.

"one of the technological marvels of the 20th century,"[50] and the *New York Times* described it as "an engineering triumph comparable to that of the Panama and Suez Canals" and "a tunnel to bring England closer to France."[51] Indeed, the *New York Times* is the only of the three newspapers mentioned here that draws a direct comparison with a nineteenth-century engineering work. Beyond this obvious reference, though, it is fascinating to see that twentieth-century commentary on the inauguration of an engineering structure is astonishingly similar to what Victorian newspapers would have written around a hundred years earlier (in the sense that the tunnel is referred to as 'triumph', 'marvel' and 'monument,' and is deemed to reduce the distance between the two countries). Obviously, these are only a few snippets taken from the particular newspapers' coverage on the opening, and as such they do by no means allow for any definite conclusion. Nonetheless we can take them as indication of the extent to which our thinking about technology has been influenced by Victorian narratives.[52]

These three examples already demonstrate that studying Victorian ideas, expectations and anxieties will not only provide insights into nineteenth-century mindsets and mentalities, that is, the way(s) in which contemporaries saw themselves in relation to, for instance, nature or non-European civilizations and what role the seemingly all-pervasive idea of progress played. Teasing out similarities and continuities, such analysis will also show that, rather than thinking of ourselves "as reaching across a postmodern historical rupture (…), we may instead begin to suspect how far we haven't come in one hundred years, that we appeal to Victorian culture in order to think about problems and needs that are not wholly unprecedented."[53] As Linda Simon highlights in her study on the social and cultural history of electric technologies and electrification in the United States in the second half of the nineteenth century, "[a]s we respond to new technologies (…) we carry with us an inheritance from those who gazed with fascination and trepidation at the first incandescent light bulb, and at the astounding

[50] Ray Moseley, "Eurotunnel Opens Amid Pomp, Yawns," *Chicago Tribune*, 7 May 1994, last viewed 3 December 2013. http://articles.chicagotribune.com/1994-05-07/news/9405070115_1_channel-tunnel-french-president-francois-mitterrand-french-leader.
[51] William E. Schmidt, "The World; All Aboard for the Chunnel of Love-Hate," *The New York Times*, 1 May 1994, last viewed 3 December 2013, http://www.nytimes.com/1994/05/01/weekinreview/the-world-all-aboard-for-the-chunnel-of-love-hate.html.
[52] What is more, Queen Elizabeth II also remarks that in the future "this cooperation [between French and British authorities] will stimulate new bonds of friendship and understanding as we work together to ensure the successful operation of the Shuttle, the Eurostar trains and the Freight Service," and thus – at least indirectly – asserts that technologies can foster mutual understanding and help improve interstate relations. "Speech at the Opening of the Channel Tunnel."
[53] Krueger, introduction to *Functions of Victorian Culture*, xii.

shadowy image of their bones, made visible by an inexplicable ray.“[54] In this sense, she points out that the historical study of responses to new technologies enables us “to reflect upon our responses, to illuminate who we once were, and to imagine who we might become.”[55] As pointed out by Eric Hobsbawm, these are the main functions of studying the past.

1.2 Objects of Study and Methodological Approaches

Due to the ongoing digitalization of (not only) British press products of previous centuries, access to this kind of material was comparatively easy to achieve. Owing to the abundance of publications available and the length of the period under observation, however, this (digital) ‘archive’ was seemingly unlimited. The author function not being available as a tool by means of which to delimit these vast collections (bear in mind that most of what was printed in nineteenth-century newspapers and periodicals was published anonymously), other strategies were necessary in order to narrow down the material and make it manageable.[56] For this purpose, the following selection criteria have been imposed (with this study aiming at a qualitative evaluation of media coverage, rather than a quantitative analysis, methodological representativeness in the strict sense was not aimed for):

To start with, it seemed reasonable to delimit the material available by concentrating on certain world regions. The dissertation therefore focuses primarily on channels of transport and communication between Great Britain and the Indian subcontinent, on the one hand, and Great Britain and the United States, on the other. In the nineteenth century, Great Britain’s prosperity hinged to a considerable extent on the Indian subcontinent. The reasons for this were manifold: firstly, India had become the major market for textiles produced in Britain. Secondly, under Lord Dalhousie a system was introduced according to which companies investing in the construction of Indian railways were guaranteed a yield return of 5 percent; British companies made ample use of this opportunity, and capital export thus has to be viewed as another reason for which India was of particular importance to Great Britain. Furthermore, with both raw materials, on the one hand, and locomotives and coaches, on the other, being imported

[54] Linda Simon, *Dark Light. Electricity and Anxiety from the Telegraph to the X-Ray* (Orlando: Harcourt, 2004), 2.
[55] Ibid.
[56] Cf. Mussell, *The Nineteenth-Century Press in the Digital Age*, 38f.

from Britain, British economy as a whole profited from railway construction in India.[57] For all these commercial activities, speedy and reliable means of transport and communication were indispensable.

Moreover, the 1857/58 uprising revealed that the control exercised by the *East India Company* was by no means as stable as had been believed; as a result, the British government assumed power by means of the Act for the Better Government of India in 1858. In the aftermath of the so-called Mutiny, the political aspect of improved means of transport and communication loomed large in public perception, and both the attempt of laying a cable through the Red Sea in 1859/60 and the construction of various land lines in the mid-1860s have to be viewed in light of this alleged need for state communication.[58] What is more, the improved transport and communication channels between Britain and India were also important in the sense that they accelerated communication with East and South-East Asia and the Antipodes.

The United States were another indispensable trade partner of Great Britain, and therefore rapid channels of transport and communication across the Atlantic Ocean were of paramount importance for the business community. Cotton and grain were peculiarly significant import goods for Britain: cotton was the most traded primary product of the time, and Great Britain – British cotton industry being considered the driving force behind the country's industrialization – obtained 75 percent of cotton imports from the United States.[59] Similarly, prior to the First World War, grain trade accounted for more than 9 percent of world trade. From 1870 onwards, most European states came to import grain from the US, and Great Britain, growing only around one fifth of the amount of grain needed domestically, hinged on these imports. Both trade in cotton and grain depended on swift channels of communication, the significance of which is also illustrated by the fact that the expansion of cable capacities in the North Atlantic and the growth in trade volume between Europe and the United States coincide chronologically. [60] Moreover, stock markets depended on speedy exchange of

[57] Cf. Dietmar Rothermund, *Indiens wirtschaftliche Entwicklung. Von der Kolonialherrschaft bis zur Gegenwart* (Paderborn: Schöningh, 1985), 31-48.
[58] Cf. Michael Wobring, *Die Globalisierung der Telekommunikation im 19. Jahrhundert: Pläne, Projekte und Kapazitätsausbauten zwischen Wirtschaft und Politik* (Frankfurt am Main: Peter Lang, 2005), 249-255.
[59] Interestingly, when this source of supply was no longer available during the American Civil War, it was again India who figured prominently as a supplier of raw materials, with Bombay becoming the world's major trading centre for cotton and the volume of trade between Britain and India increasing enormously in the years of the American Civil War. Cf. Wobring, *Globalisierung der Telekommunikation*, 270.
[60] Cf. ibid., 211-215.

information.[61] Given the importance of India and the United States as market outlets and trade partners, it was assumed that the respective emerging and/or burgeoning transport and communication channels were reported most regularly and frequently.

Focusing on transport and communication channels between Great Britain and India or the United States still generates a seemingly endless supply of material to evaluate. The following 'events' have therefore been chosen for a more detailed analysis:

1) The *Great Western* steamship's voyage across the Atlantic in 1838 (first transatlantic passage of a steamship)
2) First attempts of laying transatlantic submarine cables in 1857 and 1858 (the latter at least temporarily successful)
3) Launch of the *Great Eastern* steamship in 1858 (originally designed for passage to India and Australia, eventually used as a cable-laying ship)
4) Attempt of and successful laying of transatlantic submarine cable in 1865 and 1866, respectively (these being cable-laying operations the *Great Eastern* was involved in)
5) Opening of the Suez Canal in 1869
6) Opening of the Mont Cenis Tunnel in 1871
7) Laying of the submarine cable to India.

Generally speaking, these particular technologies have been chosen as they all, at their respective time, introduced qualitative and/or quantitative improvements in terms of transport and communication. Just as before, I have therefore assumed that they have aroused intense public interest and that this would be reflected in contemporary press publications. Except for no. 5 and 6, these were projects carried out on the initiative of the British Government and/or British companies. In this connection, both the 1857/58 attempts of laying a transatlantic submarine cable and the launch of the *Great Eastern* steamship are particularly noteworthy in the sense that they 'failed'; how such setbacks were reported will be of peculiar interest. Despite being of paramount importance for transport and communication between Britain and the Indian subcontinent, both the Suez Canal and the Mont Cenis Tunnel were initiated and constructed by rivaling European states (the Suez Canal under French, the Mont Cenis Tunnel under French and Italian auspices). What is more, the Suez Canal was – at least at the outset – openly

[61] Cf. ibid., 216-221.

rejected by the British government. If, and if so, to what extent, this is reflected in media coverage, can provide further information about the extent to which technologies were viewed as national achievements. Moreover, I have decided to take into account the reporting on the Great Exhibition of 1851. As Asa Briggs has pointed out in his study on *Victorian People* (originally published in 1954), the year 1851 presents a "perfect vantage point for a survey of nineteenth-century England."[62] Analyzing the media coverage the Exhibition – which both historians and contemporaries considered one of the most important events of the year[63] – received will therefore allow for further insights into Victorian attitudes to science and technology in general. What is more, the emerging transport and communication technologies were of paramount importance for the speedy realization of the Exhibition, and it has been assumed that this was also reflected in the various publications.

Finally, the following newspapers and periodicals have been selected:

1) *The London Times* (hereafter *Times)*
2) *The Manchester Guardian*
3) *The Scotsman*
4) *The Liverpool Mercury* (all of which published daily)
5) *The Observer*
6) *The Illustrated London News*
7) *Lloyd's Weekly Newspaper* (the latter three published on a weekly basis).[64]

In addition, other printed publications of relevance, such as books or pamphlets published on the occasion or in the aftermath of the inauguration of any of the relevant technologies, are taken into consideration, their objective usually being to provide further information on the particular technology and to point out their (potential) ramifications.[65] The selection of newspapers is based on the fact that at least a minimal

[62] Asa Briggs, *Victorian People. A Reassessment of Persons and Themes, 1851 – 67* (Chicago: University of Chicago Press, 1975), 15.
[63] Cf. ibid; see also chapter 2.4.
[64] Of all the publications chosen, the *Illustrated London News* and *Lloyd's Weekly Newspaper* are the only ones that were not published throughout the entire period of observation, both being first published in 1842. Given the fact that from then on, they were continually published on a weekly basis, and due to the topics they covered (see chapter 1.3.3), they seemed nonetheless suitable for the purpose of this dissertation.
[65] According to the UNESCO's definition, a pamphlet is "a non-periodical printed publication of at least 5 but no more than 48 pages, exclusive of the cover pages, published in a particular country and made available to the public;" a book, on the other hand, is defined as a printed publication of at least 49 pages; cf. General Conference of the UNESCO, Thirteenth Session, *Recommendations Concerning the*

degree of national representativeness was aimed for (rather than analyzing London-based publications only), particularly taking into consideration that the business communities in Manchester, Liverpool and Edinburgh certainly had an interest in improving channels of transport and communication. Moreover, it seemed fruitful to examine newspapers and periodicals aiming at different audiences (for a detailed presentation of the various publications, see chapter 1.3.3).

The contents of the newspapers and periodicals were evaluated by scanning the entire year in which one of the relevant technologies became operational (rather than only the weeks immediately before and after inauguration). I have adopted this approach for several reasons: at times, dates of inauguration or launch could not be adhered to as originally scheduled and had to the postponed (such as in case of the *Great Eastern*). In other cases, initially successfully installed devices ceased functioning after a few weeks' time (as mentioned before, the transatlantic submarine cable of 1858) and would therefore receive attention once again. Moreover, towards the end of the year, newspapers and periodicals reminisced about the past year and thus addressed certain topics once more. In analyzing the reporting published immediately before or after the implementation only, a great deal of material directly related to the research interests of this study would have been disregarded. For this reason, as concerns projects whose construction extended over a particularly long period of time (bear in mind that construction works of both the Suez Canal and the Mont Cenis Tunnel extended over more than a decade), coverage in the years preceding their inauguration was taken into consideration as well. Besides reports on current news and editorials, letters to the editor and speeches related to these technologies (held, for instance, at inauguration festivities or public meetings, usually printed verbatim) were taken into consideration. Advertisements, articles revolving mainly around questions of financing and profitability, and illustrations, on the other hand, were not taken into account. Owing to these selection criteria, the amount of material to be included could be limited in a reasonable way.

International Standardization of Statistics Relating to Book Production and Periodicals; 19 November 1964.http://portal.unesco.org/en/ev.phpURL_ID=13068&URL_DO=DO_TOPIC&URL_SECTION=201.html. For the purpose of this study and as these materials are thought to complement the analysis of the press coverage, I will not further dwell on these distinctions. What matters is basically that such publications were generally available at a comparatively cheap price and that one can therefore safely assume that they attracted a wide audience from different social backgrounds. For a detailed account of their emergence and social, political and cultural functions, see Joad Raymond, *Pamphlets and Pamphleteering in Early Modern Britain* (Cambridge: Cambridge University Press, 2003).

I have decided to subsume this analysis under the term discourse. Given the fact that the term is used differently in a wide range of disciplines, such as sociology, philosophy and linguistics (sometimes there may even be different approaches towards it *within* one single discipline),[66] and that Foucault himself used in it a variety of ways,[67] it seems appropriate to briefly elaborate on the reasons for which I have chosen to do so.[68] In general, Foucault's work can be categorized under the domains of archaeology, genealogy and ethics.[69] In the context of this dissertation, the domain of archaeology is of particular interest, for it is here that discourse analysis is conceptualized – in the words of Reiner Keller – as a historical snapshot of a particular point in time in history.[70] Generally speaking, Foucault, being dissatisfied with the way in which primary source material was drawn upon in order to reconstruct the past, was not interested in judging the validity of primary sources or in contemplating the ideas and opinions of seemingly particularly important public figures. Instead, the objective he aimed for with the 'historical snapshot' was to disclose 'hidden' structures which unnoticed organize knowledge and determine what is counted as such (that is, the rules which determine what is considered true or false at a given point in time). In the style of an archaeologist, Foucault was therefore concerned with 'excavating' these underlying structures.[71] According so Sarasin, discourse analysis is therefore looking for the algorithm according to which certain statements are being generated, while others are eliminated.[72] As this dissertation analyzes the media coverage of nineteenth-century transport and communication technologies and, in so doing, 'excavates'

[66] Sociologists, for instance, avail themselves of both Habermas' concept of discourse ethics, on the one hand, and Foucauldian discourse analysis, on the other. Cf. Laura Kajetzke, *Wissen im Diskurs. Ein Theorienvergleich von Bourdieu und Foucault* (Wiesbaden: VS Verlag für Sozialwissenschaften, 2008), 30.

[67] In *The Archaeology of Knowledge*, Foucault writes: "[I]nstead of gradually reducing the rather fluctuating meaning of the word 'discourse', I believe that I have in fact added to its meaning: treating it sometimes as the general domain of all statements, sometimes as an individualizable group of statements, and sometimes as a regulated practice that accounts for a certain number of statements." Michel Foucault, *The Archaeology of Knowledge and the Discourse on Language* (New York: Pantheon Books, 1972), 80.

[68] In line with Foucault's idea of a tool box from which one should choose exactly what is needed, I will only dwell on aspects that are significant in the context of this study. For a detailed introduction into discourse analysis, see for instance, Sara Mills, *Discourse* (London: Routledge, 1997); Marianne Jørgensen and Louise J. Phillips, *Discourse Analysis as Theory and Method* (Sage: London, 2002); Franz X. Eder, (ed.), *Historische Diskursanalysen. Genealogie, Theorie, Anwendungen* (Wiesbaden: VS Verlag für Sozialwissenschaften, 2006).

[69] Sarasin refers to these domains as 'phases', but he admits that this implies a chronological sequence (and separation) which does in fact not exist; instead, these different domains should be understood as shifting emphases rather than new approaches; cf. Philipp Sarasin, *Michel Foucault zur Einführung* (Hamburg: Junius, 2005), 12; Reiner Keller, *Diskursforschung. Eine Einführung für Sozialwissen-schaftlerInnen* (Wiesbaden: Springer Fachmedien, 2011), 50.

[70] Cf. Keller, *Diskursforschung*, 50.

[71] Cf. ibid., 45f.

[72] Cf. Sarasin, *Foucault zur Einführung*, 110.

contemporaries' approaches towards and perceptions of these technologies (thus exposing what was counted as 'knowledge' and 'true' in this connection), it seemed appropriate to use the term discourse analysis.

1.3 Reading the Past – Victorian Newspapers and Periodicals as Primary Sources

As Mark Hampton points out, newspapers, the information they provided and the very act of reading a newspaper were made mention of in many nineteenth-century novels, which is why he draws the conclusion that they "attained a prominent place in British society"[73] in the course of the second half of the nineteenth century. Similarly, Lucy Brown highlights that "the newspaper became established as part of the normal furniture of life *for all classes*"[74] [my italics] from around 1850 onwards. In fact, newspapers and periodicals flourished at the time and are a treasure trove for everyone wishing to acquaint himself with and reconsider what he knows about the Victorians' outlook on the world they lived in. An analysis of the media coverage of transport and communication technologies in Victorian Britain is therefore primarily an examination of these two genres. This centrality of newspapers and periodicals in Victorian society is due to several concomitant developments, which I will briefly outline on the following pages, before I introduce the publications I have chosen for analysis.

1.3.1 Education, Literacy and Access to Print Publications

In the course of the nineteenth century, literacy rates had risen. This improvement, along with the resulting growth of readership and the formation of a mass public, is often (albeit incorrectly) attributed to the Education Act of 1870.[75] Despite the fact that there had been no *national* schooling system before 1870, though, the population was far from being unschooled: There was a wide variety of voluntary institutions, such as

[73] Mark Hampton, *Visions of the Press in Britain. 1850 -1950* (Urbana: University of Illinois Press, 2004), 25.
[74] Lucy Brown, *Victorian News and Newspapers* (Oxford: Clarendon Press, 1985), 273.
[75] Since the beginning of the nineteenth century, there had been an awareness of the importance of education in general, and that of the working classes in particular; a first government agency for educational matters was founded in 1839 and systematization of schooling progressed from mid-century onwards. It was only with the 1870 Education Act, though, that a national system of education was established. Cf. Laura Novo, "Education, Elementary," in *Victorian Britain. An Encyclopedia*, ed. Sally Mitchell (New York: Garland Publishing, 1988), 241f.

Sunday schools organized by the parish. Most of these institutions were small and of an ephemeral character, but people "dipped [into these educational opportunities] as and when they could and at the level they could best afford."[76] As Vincent has convincingly demonstrated, literacy rates had improved throughout the century, and the transition towards a literate society had been much smoother than is widely assumed.[77] The notion of a largely analphabetic society at the turn of the nineteenth century and "ghettoes of illiteracy"[78] before 1870 is therefore misleading. Accordingly, around mid-century, individual basic literacy rates ranged in England between around 70 percent for men and 55 percent for women.[79] Moreover, as Vincent emphasizes,

> [f]ew people lived alone in the eighteenth and nineteenth centuries, and fewer still lacked either relatives or close friends. In households, in the informal relationships in the neighbourhood, literate and illiterate were everywhere in each other's company.[80]

Around the middle of the nineteenth century there was thus a collective literacy rate of 85 percent, so that "at least at a collective level, most had access to the literacy required for enjoying newspapers."[81]

Mainly due to their high prices before the repeal of the so-called taxes on knowledge (see below), newspapers and other print publications were often purchased collectively anyway or were read in public places. Many coffee houses, pubs or public institutes provided their guests and visitors with reading material. What is more, newspapers would be read out aloud at times. Alternatively, people would purchase a newspaper for a cheaper price a few days after its publication. Therefore, the circulation figures given for any newspaper during this period can only offer a rough guide as to actual readership, and estimates vary accordingly.[82] It is clear, though, that more people than ever before were either capable of reading newspapers and periodicals themselves or could indulge in them through their social network.

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[76] Philip Gardner, "Literacy, Learning and Education," in *A Companion to Nineteenth-Century Britain*, ed. Chris Williams (Malden, MA: Blackwell, 2004), 360.
[77] Cf. David Vincent, *Literacy and Popular Culture. England 1750 – 1914* (Cambridge: Cambridge University Press, 1989), 22.
[78] Vincent, *Literacy and Popular Culture*, 23.
[79] Cf. David Vincent, *The Rise of Mass Literacy. Reading and Writing in Modern Europe* (Cambridge: Polity Press, 2000), 9f.
[80] Ibid., 23.
[81] Hampton, *Visions of the Press*, 27.
[82] Whereas Lee estimates that each copy of a paper "was seen by perhaps half a dozen readers," Curran points out that more than 20 readers would have shared one copy of a radical newspaper during the 1830s and 1840s. Cf. Alan J. Lee, *The Origins of the Popular Press in England, 1855 – 1914* (London: Croom Helm, 1976), 35f.; James Curran, "Press History," in *Power Without Responsibility. The Press and Broadcasting in Britain*, by James Curran and Jean Seaton (London: Routledge, 1989), 14.

1.3.2 Victorian Press Market

At the beginning of the nineteenth century, however, the British press was still subject to various restrictions, such as stamp and advertisement duties. As a consequence, it performed poorly in international comparison: Drawing on an article published in the *Working Man's Friend*, Cranfield points out that in 1833, there were 320 newspapers with a annual gross circulation of 30 million available to Britain's 24 million population. At the same time, the 15 million population of the United States, where there were no taxes on knowledge, were offered 850 newspapers with a gross circulation of 65 million.[83] Moreover, neither the process of production nor that of distribution had changed very much in the course of the eighteenth century. Printing devices, such as the Stanhope Iron Press, introduced in 1800, helped improve impression, but required manual operation after all; accordingly, output was still limited to 250 copies an hour. News 'gathering' was very often tantamount to 'recycling' what other papers had printed before, and generally speaking, the press still catered mostly to the needs and interests of influential circles in the cities.

From the 1830s onwards, however, the press witnessed changes in many domains. The taxes on knowledge were gradually reduced and finally abolished in the 1850s. This came to play a most significant role in the extension of the newspaper market and the introduction of the daily penny press in the following decades. In 1860, there were no more than 15 London and 16 provincial daily papers in England, but these numbers increased enormously in the following decades. By 1890, there were around 150 dailies across the country. Correspondingly, they sold more copies than ever before (1851: 85 million copies in England; 1920: 5,604 million copies).[84]

What is more, the production and distribution of newspapers was transformed throughout the nineteenth century. With the introduction of König's steam-press in 1814, the production of 1,000 copies an hour had become viable, and the rotary press (introduced in 1848), allowed for up to 12,000 impressions per hour.[85] The gradual establishment of a railway network from the 1830s onwards helped accelerate the distribution of newspapers throughout the country. Moreover, the growing electric

[83] Cf. Geoffrey A. Cranfield, *The Press and Society. From Caxton to Northcliffe* (London: Longman, 1978), 139.
[84] Cf. Hampton, *Visions of the Press*, 28. Hampton, however, also points out that there were other factors involved in the increase, such as the prices for paper, which fell throughout the nineteenth century; cf. ibid., 36.
[85] Cf. Lee, *Origins of the Popular Press*, 55.

telegraph network and the emerging press agencies offered new chances and opportunities in terms of the gathering and distribution of news. From early on, telegraph companies, making use of the cables' surplus capacities during night-time, provided services for both national and foreign news. In so doing, they did not only reveal the ways in which the press could benefit from electric telegraphy, but also inspired resourceful businessmen such as Julius Reuter: the foundation of Reuter's eponymous press agency in London in 1851, the formation of the Press Association in 1868 and the close cooperation between these two companies that was to develop in the years to follow – Reuters providing international news which the Press Association distributed in Britain; the Press Association, in turn, supplied Reuters with domestic news – were of paramount importance in this context.

Closely related to all the developments mentioned above is the circumstance that the style of newspapers also underwent drastic changes in the second half of the nineteenth century. These are generally subsumed under the term 'new journalism'. With regard to contents, readers were supplied with an increasing amount of news instead of commentaries, and politics were only one sphere of activity that was covered among many. The focus shifted towards articles of a more personal and sensational type, such as gossip columns, women's pages, human-interest stories, and sports coverage.[86] Telegraphy also came to play a prominent role in this context, with Reuters developing the forerunner of today's breaking news by "publishing a flash or an outline before anyone else."[87] The design of newspapers underwent far-reaching changes, and by means of shorter paragraphs, larger type, cross-heads, headlines and an increasing amount of illustrations, they became more easily legible.[88]

All told, the British press market changed tremendously in the course of the nineteenth century. Various factors, such as the repeal of newspaper taxation, technological progress both in terms of production (printing) and news gathering (telegraphy, press agencies) and increasing literacy rates contributed their share to this transformation. As a result, the press no longer aimed at the upper strata of society only, but catered to the needs and interests of a larger share of the population than ever before. Newspapers and periodicals had thus become a central element of Victorian society and culture.

[86] Cf. J. O. Baylen, "The British Press, 1861 – 1918," in *The Encyclopedia of the British Press, 1422 - 1992*, ed. Dennis Griffiths (Basingstoke: Macmillan, 1992), 38.
[87] Donald Read, *The Power of News. The History of Reuters, 1849 – 1989* (Oxford: Oxford University Press, 1992), 31.
[88] Cf. Baylen, "The British Press, 1861 – 1918," 38.

1.3.3 Selected Publications

With regard to the historical relevance of the *Times* and the role it played in Great Britain from the early nineteenth century onwards, press historians seem to be unanimous in their appraisal. They consider it, among other things, "the most powerful title of the entire first half of the nineteenth century,"[89] or describe the era as "the age of the primacy of *The Times*."[90] Indeed, the *Times* was to set standards in many respects. Founded in 1785 as the *Daily Universal Register*, the originally four-paged newspaper introduced a new typesetting technique which allowed for cheaper and faster printing. In 1788, its name was changed to *The Times or Daily Universal Register* and was finally shortened to *The Times* two months later. In 1814, the *Times* was the first newspaper to make use of Koenig's steam press, by means of which the amount of copies printed per hour increased decisively.[91] As a result, printing could be done in a fraction of the time needed previously, and the *Times* could therefore provide more up-to-date news. In the following decades, both the factual news and comments it presented became increasingly appreciated and the *Times* could establish itself as the most significant newspaper for business men and industrial circles. By 1841 (that is, at the end of the editorship of Thomas Barnes), it sold more than double the amount of copies three of its rivals (*Morning Chronicle*, *Morning Herald*, *Morning Post*) combined.[92] This growth was to continue under the editorship of John Delane (1841 to 1877). Given the paper's enormous audience among influential circles, it became difficult, if not impossible for the government (or any other politician) to ignore it; indeed, the *Times* was considered to have "an influence (…) so imperious that the Speaker, instead of demanding from the Sovereign freedom of speech had much better ask it from *The Times*."[93] It was during the Crimean War that it became peculiarly obvious how influential the paper had become, when it was not only the first newspaper sending a special war correspondent to the scene, but thereby also contributed decisively to the government's resignation in 1855.[94] Its coverage of foreign news is particularly noteworthy: from early on, the *Times* had established its own correspondents on the continent, for instance in Bologna and Marseilles, but also in extra-European

[89] Aled Jones, "The Press and the Printed Word," in *A Companion to Nineteenth-Century Britain*, ed. Chris Williams (Malden, MA: Blackwell, 2004), 372.
[90] Lucy Brown, "The British Press, 1800-1860," in *The Encyclopedia of the British Press: 1422 – 1992*, ed. Dennis Griffiths (Basingstoke: Macmillan, 1992), 26.
[91] Cf. Cranfield, *Press and Society*, 152.
[92] Cf. ibid., 159.
[93] Croker in a letter to Lord Brougham, 21 July 1854, quoted in ibid., 161.
[94] Cf. ibid., 162.

metropolises such as Alexandria. Moreover, it was indeed the only daily newspaper with its own network of foreign correspondents in India prior to 1850.

When, in the aftermath of the repeal of the taxes on knowledge, a tide of so-called penny papers was founded in the 1850s and 1860s, they were hardly considered to be serious competitors; their style and coverage was too different from what the *Times*' readers would appreciate, and thus, at least on certain occasions, the *Times* would still sell around 100,000 copies of a single issue.[95]

As long as there were taxes imposed on newspapers, daily publications were mostly limited to London. In smaller cities or provincial towns, publishers were unlikely to find a sufficiently large audience affluent enough to purchase a newspaper at a price of six or seven pence every day, and the enterprise would thus have to remain unprofitable. For this reason, most people outside London would generally receive their news from weekly publications until the middle of the century. It was only with the reduction and abolition of the various taxes in the 1850s that provincial weekly papers were turned into dailies, and new daily publications were launched altogether.[96]

It should therefore not come as a surprise that the *Manchester Guardian* commenced as a weekly paper, too, originally published on Saturdays only. It was founded in the aftermath of the so-called Peterloo massacre of 1819, the first edition being published in May 1821. The founder, John Edward Taylor, considered it to be "primarily (…) a means of political expression and communication," its main objective (at least at the outset) being to expedite the issue of reform.[97] Starting with a circulation of 1,000 per issue, the number had doubled by 1823 and trebled two years later. Already at this point in time, Taylor experimented with turning the paper into a bi-weekly by purchasing the *Manchester Mercury*, which practically was a "mid-week edition of the *Guardian*."[98] It was not before 1836, though, that the *Manchester Guardian* was officially turned into a bi-weekly. When Taylor died in 1844, the *Guardian* had, in terms of circulation, become the biggest newspaper outside London (8,000 copies per issue) and was turned into a daily newspaper in 1855. In the 1850s, it reached a regular weekday circulation of 20,000 (up to 30,000 on Saturdays).[99]

[95] Cf. ibid., 209.
[96] Cf. Maurice Milne, "Press, Provincial", in *Victorian Britain. An Encyclopedia*, ed. Sally Mitchell (New York: Garland Publishing, 1988), 630.
[97] David Ayerst, *The Manchester Guardian. Biography of a Newspaper* (Ithaca, New York: Cornell University Press, 1971), 30.
[98] Ibid., 80.
[99] Cf. ibid., 33; see also Hampton, *Visions of the Press*, 28.

The *Manchester Guardian* came to play a significant role within the British newspaper market. Although it started as a regional newspaper fulfilling its readers' cravings for local news, it also gained national importance. This is (mostly) due to the circumstance that Manchester had become Britain's main transfer site for cotton and yarn, with 90 percent of British cotton industry being located in the adjacent areas by 1830.[100] Ayerst therefore points out that already in the 1820s, Manchester was the centre of a growing economic region in the North of England and asserts that by 1840,

> [t]here was something more than local interest (…) in Manchester and Lancashire news (…). What happened was often of national importance: its trade mattered greatly to the whole country; it was a dominant centre of Chartist activities, the possible scene of revolutionary disturbances; and it was the headquarters of England's first modern political machine, the Anti-Corn Law League. While remaining essentially a local paper, the *Guardian* was in the course of its ordinary duties necessarily beginning to play a significant part in national life.[101] [italics in original]

Moreover, the *Manchester Guardian* was deeply involved in the formation of the Press Association in 1868, which not only liberated provincial newspapers from the unreliable and incomplete service of the telegraph companies, but also put them in a position where they could compete with London papers.

The *Liverpool Mercury* was first published in July 1811, the aim of its proprietors being to "promote a free intercourse of ideas relative to government, trade, literature, and the fine arts" and to blend "[i]nformation, discussion, utility and amusement […] in a public journal."[102] Until 1858, it was published once a week only, but in the aftermath of the repeal of the taxes on knowledge, it was also made a daily newspaper. Similar to Manchester, Liverpool was of paramount importance to British trade and commerce in the nineteenth century, in particular in terms of cotton imports from the United States: In fact, the amount of cotton processed at Liverpool port tripled between 1820 and 1850 and amounted to 80 percent of Great Britain's total cotton import.[103] It is hardly surprising, then, that the *Liverpool Mercury* was not only read in Liverpool and the adjacent areas, but also in Wales and London.

In the second half of the nineteenth century, the *Scotsman* became Scotland's leading newspaper. Founded in Edinburgh by William Ritchie and Charles MacIaren out of

[100] Cf. Alan Kidd, *Manchester* (Edinburgh: Edinburgh University Press, 2002), 13.
[101] Ayerst, *The Manchester Guardian*, 85.
[102] "There is Nothing of Which an Englishman," *Liverpool Mercury*, 5 July 1811, 1.
[103] Cf. D. M. Williams, "Liverpool Merchants and the Cotton Trade," in *Liverpool and Merseyside. Essaysin the Economic and Social History of the Port and its Hinterland*, ed. J. R. Harris (London: Frank Cass and Co., 1969), 183f.

dissatisfaction with the existing local papers and first published on a weekly basis from January 1817 onward, it commenced with a circulation of around 900 copies. From 1822, it was published twice weekly. In the wake of the repeal of both advertisement and stamp duty, circulation increased to around 6,000 copies in the 1850s. Soon afterwards, the *Scotsman* was turned into a daily newspaper and circulation numbers grew steadily, amounting to 17,000 in 1865 and 40,000 in 1873.[104] One of the factors contributing to this ascent from a local to a truly transregional newspaper is the proprietors' innovative spirit and their willingness to avail themselves of new transport and communication technologies. In the mid-1860s, for instance, they decided to cover the high expenses for rail carriage out of their own pockets. In so doing, agents outside Edinburgh could still sell the paper for the original price (rather than adding the transport costs) which, at least partially, made for the increasing circulation figures. From around 1870, early-morning high-speed trains were used in order to transport papers coming fresh off the press from Edinburgh to Glasgow. As a result, the morning edition of the *Scotsman* was published almost simultaneously in both cities. What is more, the *Scotsman* availed itself of the *Electric Telegraph Company*'s services from 1866 onwards, hiring a cable for exclusive use, and was the first British provincial newspaper to open an office on Fleet Street in 1868.

If the *Times* was considered among the leading journals of Europe, the *Manchester Guardian*, the *Liverpool Mercury* and the *Scotsman* certainly took a similarly outstanding position among Britain's provincial papers of the time. All of these newspapers were read by a comparatively large audience and provided services and information British businessmen and trading houses involved in international commerce depended on. It is therefore reasonable to assume that all of these newspapers, catering to the interests of the business community, paid close attention to and provided adequate information about the newly emerging networks of transport and communication. Moreover, they were not only read in their specific 'hometown', but reached a wider audience.

Nonetheless, it was not daily, but weekly papers that were most widely read at that time: even after the repeal of the taxes on knowledge, daily papers were financially out of reach for the majority of society, and, as mentioned earlier, they would either buy them

[104] Cf. Dennis Griffiths (ed.), *The Encyclopedia of the British Press, 1422 – 1992* (Basingstoke: Macmillan, 1992), 508.

collectively or read them in public places, such as coffee houses or reading rooms. In private, on the other hand, most people would rather resort to weekly publications in order to read the news and/or entertain themselves. Sunday papers – appearing on what would usually be a free day and, similarly important, just after pay day – were particularly popular, and are in retrospect considered one of the major developments in nineteenth-century publishing.[105] Founded in 1791, the *Observer* is widely considered the oldest Sunday newspaper in the world. Facing enormous difficulty a few years after its launch, the proprietor attempted to sell the newspaper to the government, which did not show any interest, though. Nonetheless, in so doing, he had managed to make useful connections: under the leadership of William Clement, who owned the *Observer* from 1815 onwards, the paper profited from government subsidies and, by extension, "became a mouthpiece of the ruling party."[106] What is more, prominent political figures, such as Lord Palmerston, used the *Observer* as a forum and wrote editorials supporting government policies. The government's impact is also reflected in circulation figures: in 1819, for instance, the *Observer* sold a total of around 13,000 copies a week. On top of that, though, some 10,000 copies were distributed freely in order to promote government policy.[107] The *Observer* is furthermore noteworthy in that it pioneered the use of woodcuts and provided illustrated supplements, for instance about the coronation of King George IV in July 1821.

In fact, illustrated newspapers were another significant development from around 1840 onwards. In contrast to newspapers such as the *Observer*, which would only include illustrations in the reporting of outstanding events, these new publications would by default make use of woodcuts. In 1842, the *Illustrated London News* was founded by Herbert Ingram, who had observed that sales figures of newspapers increased whenever they featured illustrations. In the first issue, it was therefore declared that "[t]he public [would have] henceforth under their glance, and within their grasp, the very form and presence of events as they transpire, in all their substantial reality, and with evidence visible as well as circumstantial."[108] The *Illustrated London News* covered a wide range of topics, such as 'The Markets', Foreign Intelligence and Science, and declared that it was "by the publication of this very newspaper, launching the giant vessel of illustration

[105] Cf. Brown, "The British Press, 1800-1860," 29.
[106] John Richard Wood, "Observer," in *Dictionary of Nineteenth-Century Journalism in Great Britain and Ireland*, eds. Laurel Brake and Marysa Demoor (Gent: Academia Press, 2009), 466.
[107] Cf. Griffiths (ed.), *Encyclopedia of the British Press*, 159.
[108] "Our Address," *Illustrated London News*, 14 May 1842, 1.

into a channel the broadest and the widest that it has ever dared to stem."[109] The first issue appeared on 14 May, the date being well-chosen: two days earlier, Queen Victoria had held a fancy-dress ball at Buckingham palace, and readers were provided with many illustrations. The first issue sold 26,000 copies and was reprinted several times afterwards. Priced six pence, the *Illustrated London News* was relatively expensive and was thus from the outset a "popular journal of the middle-brow and middle class."[110] The makers of the *Illustrated London News* considered it a "Pictorial Family Newspaper"[111] and, as a result, the "ethical mandate of the paper [was] expressed in terms of middle-class family values."[112] In the final issue of the year 1842, however, the *Illustrated London News* pointed to the diverse readership it had found in the first few months of its existence:

> Circulating much, perhaps chiefly, amongst the higher and middle classes, we have yet stood sturdily by the swelling bulk of the people, and have heartily championized the poor. It is no small pride to us that we have won the esteem of the working classes, and we have hundreds of testimonials to that effect.[113]

In fact, already in 1843, the *Illustrated London News* had established itself among the leading weekly papers in Britain (selling more than 40,000 copies per issue) and soon spawned international imitators.[114] Circulation rose continuously (from 67,000 in 1850 to 123,000 in 1855) and occasionally, for instance when covering the wedding of Prince Edward and Princess Alexandra in 1863, reached an outstanding 310,000.[115] It was therefore not only the most well-known illustrated newspaper of the time, but had also managed to establish itself as "part of the social fabric."[116]

Popular as it was, the *Illustrated London News* did not only spawn imitators abroad, but also at home. *Lloyd's Weekly Newspaper* was by far the most successful of these.[117] Edward Lloyd – a London publisher who had previously launched several other

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[109] Ibid.
[110] Katherine M. Newey, "'Dramatic and Musical Chit Chat': Theatrical Writing in *The Athenaeum* and *The Illustrated London News* in 1843," *Victorian Periodicals Review* 23, no. 4 (1990):11.
[111] "The Illustrated London News," *Illustrated London News*, 2 July 1842, 127.
[112] Peter W. Sinnema, *Dynamics of the Pictured Page. Representing the Nation in the Illustrated London News* (Ashgate and Brookfield: Aldershot, 1998), 13.
[113] "The Close of the Year 1842," *Illustrated London News*, 31 December 1842, 529.
[114] Cf. W. H. Smith, "The Early Days of 'The Illustrated London News'," in *History as Hot News. 1842 - 1865. The World of the Early Victorians as seen through the Eyes of the Illustrated London News*, ed. Leonard de Vries (John Murray: London, 1967), 10.
[115] Cf. Cranfield, *Press and Society*, 171.
[116] Ibid.
[117] It was originally published under the name *Lloyd's Illustrated London News*, which was changed to *Lloyd's Weekly London Newspaper* after a few weeks, before it was finally given the title *Lloyd's Weekly Newspaper* in 1849.

publications such as the *Penny Sunday Times* – founded the eponymous Sunday paper in 1842, the first issue being published on 27 November. Until January 1843, the paper was published unstamped and sold for a mere two pence – in other words, a third of the price of the *Illustrated London News* – before the authorities intervened and taxes had to be paid. Nonetheless, *Lloyd's* was still far less expensive than the *Illustrated London News*. There was a demand for cheap magazines, and with "[t]hose whose means were scantier, or who knew the value of money, [buying] Lloyd's,"[118] Edward Lloyd managed to delineate his paper from the middle-class pioneer and, "lending itself more to topics of general interest than particular politics,"[119] appealed to a lower-middle and working-class audience.

The demand for this kind of publication among the lower strata of Victorian society is sufficiently illustrated by the steadily increasing circulation figures: Whereas in 1843 – that is, only one year after the magazine had been launched – 43,000 copies were sold a week, this number was to double within the following ten years (1853: 90,000). In anticipation of the repeal of the paper duty, the price was reduced to one penny in September 1861, and circulation increased to 170,000; two years later, it had reached an unprecedented 350,000, and, in so doing, had achieved "a success unparalleled in its way."[120]

The *Observer*, the *Illustrated London News* and *Lloyd's Weekly Newspaper* thus represent one of the major developments of Britain's nineteenth-century media landscape. Particularly the *Illustrated London News* and *Lloyd's Weekly Newspaper* found a ready market among their respective target readership, and both covered a wide range of topics, explicitly including imperial and foreign news. It has therefore been assumed that they gave ample coverage to the various events and expeditions related to the newly emerging transport and communication networks.

[118] H.R.Fox Bourne, *English Newspapers. Chapters in the History of Journalism* (London: Chatto and Windus, 1887) 2:254.
[119] Sari Beth Altschuler, "Lloyd's Weekly Newspaper," in *Dictionary of Nineteenth-Century Journalism in Great Britain and Ireland* , eds. Laurel Brake and Marysa Demoor (Academia Press: Gent, 2009), 371.
[120] Bourne, *English Newspapers*, 2:348.

1.4 Literature Review

The various transport and communication technologies which emerged in the course of the nineteenth century, the growth of a global transport and communication network and its impact (or sometimes also lack hereof) on a multitude of spheres and fields of activity have received persistent scholarly attention. The number of publications tracing the emergence and construction of the new links and lines has grown steadily. Already in 1929, Hoskins' *British Routes to India* was published, providing detailed information on British efforts to establish secure, speedy and efficient channels of transport and communication with their possessions on the subcontinent and the many problems and conflicts they had to face in the process.[121] In *Steaming East*, Sarah Searight has in a similar manner engaged in the *Forging of Steamship and Rail Links Between Europe and Asia*.[122] As the title indicates, she does not only consider connections between Britain and India, but also looks at railway lines and steamship services to the Middle East. The Suez Canal and its role within the context of the Eastern Question and the Great Game have been elaborated on by William Jackson[123] and Zachary Karabell.[124] Ransom, in turn, has traced the construction of the *Mont Cenis Fell Railway*.[125] Although – as the title indicates – he is primarily interested in the summit railway, he also dwells on the construction of the Mont Cenis Tunnel and the significance of speedy passage through this part of the Southern Alps in terms of Britain's communication with the Middle East and South Asia. Stephen Fox, on the other hand, has looked into the development of Atlantic passage, retracing the developments and changes occurring between 1830 and the early twentieth century.[126]

The development of a global communications infrastructure, specifically the electric telegraph network, has received special attention. The reason for this may primarily be that by means of the telegraph and the inherent dematerialization of information flows, the speed at which information travelled reached an entirely new quality.[127] Tracing the

[121] Halford L. Hoskins, *British Routes to India* (New York: Longmans, Green, and Co., 1928).
[122] Sarah Searight, *Steaming East. The Forging of Steamship and Rail Links between Europe and Asia* (London: Bodley Head, 1991).
[123] William Jackson, *The Pomp of Yesterday. The Defence of India and the Suez Canal, 1798 – 1918* (London: Brassey, 1995).
[124] Zachary Karabell, *Parting the Desert. The Creation of the Suez Canal* (New York: A.A. Knopf, 2003).
[125] P. J. G. Ransom, *The Mont Cenis Fell Railway* (Truro: Twelveheads Press, 1999).
[126] Stephen Fox, *Transatlantic: Samuel Cunard, Isambard Brunel, and the Great Atlantic Steamships* (New York: Harper Collins, 2003).
[127] By analyzing the information provided by *Lloyd's List*, Kaukiainen, however, has impressively demonstrated that the speed with which information travelled had already been drastically reduced prior to the large-scale application of the electric telegraph, due to both the more speedy means of

integration of various world regions into the electric telegraphy network, Ahvenainen, for instance, has made valuable contributions to the historiography of global communication structures.[128]

Looking at the sheer amount of publications, the imperial utilization of transport and communication technologies appears to have been a matter of special interest to historians. Innis' *Empire and Communications* provides a general overview over the role communication and the respective media and technologies played for imperial integration and administration.[129] Around thirty years later, Daniel Headrick's *Tools of Empire* was published, in which he examines the nexus between *Technology and European Imperialism in the Nineteenth Century*.[130] A large part of the book is devoted to what Headrick refers to as communication revolution. Here, he dwells on (among other things) the significance of steamships for imperial purposes; the role the Suez Canal came to play in this context; and the relevance of British submarine cables in terms of control over British colonial possessions. It was this account of how various technologies enabled and facilitated New Imperialism that intensified historians' interest in these (and related) questions. Headrick himself explored the topic in several subsequent publications, such as *The Invisible Weapon*,[131] and other historians followed suit and addressed questions of *Geopolitics and Technology* [132] or *Telegraphic Imperialism.* [133] Obviously, other imperial powers would also avail themselves of telecommunications: Daqing Yang, for example, has investigated the role electric

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transportation in the form of steamships and railways, on the one hand, and improved organization of the various processes of mail distribution, on the other; cf. Yrjö Kaukiainen, "Shrinking the World. Improvements in the Speed of Information Transmission, c. 1820 – 1870," *European Review of Economic History* 5, no. 1 (2001).

[128]Jorma Ahvenainen, *The European Cable Companies in South America before the First World War* (Helsinki: Finnish Academy of Science and Letters, 2004); Jorma Ahvenainen, *The History of the Caribbean Telegraphs before the First World War* (Helsinki: Finnish Academy of Science and Letters, 1996); Jorma Ahvenainen, *The Far Eastern Telegraphs: The History of Telegraphic Communications between the Far East, Europe and America before the First World War*. (Helsinki: Finnish Academy of Science and Letters, 1981).

[129] Harold A. Innis, *Empire and Communications* (Oxford: Clarendon Press, 1950).

[130] Daniel R. Headrick, *Tools of Empire,* 1981.

[131] Daniel R. Headrick, *The Invisible Weapon. Telecommunications and International Politics, 1851 – 1945* (New York: Oxford University Press, 1991). See also Daniel R. Headrick, "A Double-Edged Sword: Communications and Imperial Control in British India," in *Historical Social Research – Historische Sozialforschung. Global Communication: Telecommunication and Global Flows of Information in the Late 19th and Early 20thCentury*, ed. Roland Wenzlhuemer (Cologne: Center for Historical Social Research, 2010).

[132] Hugill, *Global Communications.*

[133] Deep Kanta Lahiri Choudhury, *Telegraphic Imperialism. Crisis and Panic in the Indian Empire, c. 1830-1920* (Basingstoke: Palgrave Macmillan, 2010).

telegraphy came to play in the Japanese Empire.[134] Moreover, technologies of transport and communication also had an impact on international relations in the sense that they influenced the way diplomacy, on the one hand, and warfare, on the other, were conducted.[135]

The new transport and communication technologies, however, were more than mere tools of empire; they also catered to the needs of business communities, which were in dire need of speedy and reliable channels of communication.[136] Various studies have demonstrated that both railways and telegraphy contributed to closer integration of markets,[137] and the Suez Canal's impact on world trade has also been examined. [138] The impact of telegraphic communication on shipping and the far-reaching changes this brought about for global trade have been investigated by Byron Lew and Bruce Cater,[139] who emphasize the advantages resulting from quasi-instantaneous communication (such as up-to-date information, based on which ship-owners could reschedule the ship's itinerary after it had left port). They therefore concluded that "[i]f the telegraph benefited shipping, then it must have benefited trade."[140] It must be warned against

[134] Daqing Yang, *Technology of Empire: Telecommunications and Japanese Expansion in Asia, 1883 – 1945* (Cambridge, MA: Harvard University Asia Center, 2010).
[135] David Paull Nickles, "Diplomatic Telegraphy in American and German History," in *Atlantic Communications: The Media in American and German History from the Seventeenth to the Twentieth Century*, ed. Norbert Finzsch and Ursula Lehmkuhl (Oxford: Berg, 2004); David Paull Nickles, *Under the Wire: How the Telegraph Changed Diplomacy* (Cambridge MA: Harvard University Press, 2003); David Paull Nickles, "Telegraph Diplomats: The United States' Relations with France in 1848 and 1870," *Technology and Culture* 40, no. 1 (1999); Jack Nicholls, "The Impact of the Telegraph on Anglo-Japanese Diplomacy during the Nineteenth Century," *New Voices* 3 (2009); Christian Wolmar, *Engines of War. How Wars Were Won and Lost on the Railways* (New York: Public Affairs, 2010); Laszlo Solymar, "The Effect of the Telegraph on Law and Order, War, Diplomacy, and Power Politics," *Interdisciplinary Science Reviews* 25, no. 3 (2000).
[136] According to Winseck and Pike, private companies therefore played a most significant role in terms of the construction of the global telegraph network; Dwayne R. Winseck and Robert M. Pike, *Communication and Empire. Media, Markets, and Globalization, 1860 – 1930* (Durham: Duke University Press, 2007).
[137] John Hurd II, "Railways and the Expansion of Markets in India, 1861-1921," *Explorations in Economic History* 12, no. 3 (1975); Jacob Metzer, "Railroad Development and Market Integration: The Case of Tsarist Russia," *Journal of Economic History* 34, no. 3 (1974); Mette Ejrnæs and Karl Gunnar Persson, "The Gains from Improved Market Efficiency: Trade Before and After the Transatlantic Telegraph," *European Review of Economic History* 14, no. 3 (2010); John Langdale, "Impact of the Telegraph on the Buffalo Agricultural Commodity Market: 1846-1848," *Professional Geographer* 31, no. 2 (1979); Kenneth D. Garbade and William L. Silber, "Technology, Communication and the Performance of Financial Markets: 1840-1975," *The Journal of Finance* 33, no. 3 (1978).
[138] Max E. Fletcher, "The Suez Canal and World Shipping, 1869 – 1914," *Journal of Economic History* 18, no. 4 (1958).
[139] Byron Lew and Bruce Cater, "The Telegraph, Co-ordination of Tramp Shipping, and Growth in World Trade, 1870 – 1910," *European Review of Economic History* 10, no. 2 (2006). See also Lars U. Scholl, "The Global Communications Industry and its Impact on International Shipping before 1914," in *Global Markets: The Internationalization of the Sea Transport Industries since 1850*, eds. David J. Starkey and Gelina Harlaftis (St. John's: International Maritime Economic History Association, 1998).
[140] Lew and Cater, *The Telegraph and Tramp Shipping*, 151.

oversimplified and monocausal analysis, though: David Jacks and Krishna Pendakur have investigated "Global Trade and the Maritime Transport Revolution" between 1870 and 1913 and have come to the conclusion that despite the seemingly obvious correlation (increases of 400 percent in global trade while freight rates declined on average by 50 percent), it was other factors, such as income growth and convergence, that were primarily responsible for the growth in world trade.[141]

As has been mentioned earlier, with information travelling faster than ever before, the gathering and distribution of news was subject to far-reaching changes in the course of the nineteenth century and the press benefited decisively from the newly emerging transport and communication infrastructure. From early on, telegraph companies would transmit time-critical information, such as stock-market prices and other market-relevant news.[142] Later, press agencies, which made full use of the opportunities the telegraph offered, were founded, bearing witness to the fact that news had become a global commodity and profitable business.[143] Julius Reuter founded his London-based news agency of the same name in 1851 and managed to establish his business as "an institution of the British Empire."[144] Accordingly, the interplay of the electric telegraph network, the transmission of news, and imperial news coverage in Britain has received sustained scholarly attention.[145] Kielbowicz, however, makes a stand against over-simplified before-and-after comparisons by pointing out how, under certain circumstances, news exchanges by mail could compete with the electric telegraph, as each "occupied different functional niches in the system of news relay."[146] Similarly, Amelia Bonea has also questioned the role attributed to the electric telegraph when it comes to news reporting and, using the example of India, has examined to what extent socio-cultural or political factors mattered in this context.[147]

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[141] David S. Jacks and Krishna Pendakur, "Global Trade and the Maritime Transport Revolution," *Review of Economics and Statistics* 92, no. 4 (2010).
[142] Cf. Winseck and Pike, *Communication and Empire*, 18.
[143] Terhi Rantanen, *When News Was New* (Oxford: Wiley-Blackwell, 2009); Terhi Rantanen, "The Globalization of Electronic News in the 19th Century." *Media, Culture and Society* 19, no. 4 (1997).
[144] Read, *The Power of News*, 40.
[145] Chandrika Kaul, *Reporting the Raj: The British Press and India, c. 1880 – 1922* (Manchester: Manchester University Press, 2003); Simon J. Potter, *News and the British World: The Emergence of an Imperial Press System, 1876 – 1922* (Oxford: Clarendon Press, 2003).
[146] Richard B. Kielbowicz, "News Gathering by Mail in the Age of the Telegraph. Adapting to a New Technology," *Technology and Culture* 28, no. 1 (1987), 41. See also Peter G. Goheen, "The Impact of the Telegraph on the Newspaper in Mid-Nineteenth Century British North America," *Urban Geography* 11, no. 2 (1990).
[147] Amelia Bonea, "'This cable…was not in my words': News Reporting and Telegraphic Communication in Nineteenth-Century India" (PhD diss., Heidelberg University, 2012).

Beyond that, the various technologies had multifarious sociocultural ramifications. Gender issues have received attention in terms of both railways and telegraphy. Diane Drummond has outlined how railway usage was gender-specific and how the experiences men and women made with this new means of transport therefore differed.[148] The emergence of new professional groups with the advent of electric telegraphy has also been examined in several studies.[149]

Furthermore, railways and steamships helped 'opening up' the country in various ways. New technologies of transport contributed to the emergence of popular tourism and thus enabled a growing number of people to travel the country and visit sights and areas which had previously been difficult to access.[150] What is more, railways changed both cities and landscapes. Questions of the railways' influence on urban development and growth have therefore been at the centre of numerous studies.[151] As regards telegraphy in urban areas, Tarr, Finholt and Goldman attended to *Urban Telecommunications in the Pre-Telephone Era*[152] and came to the conclusion that "in spite of the critical nature of communications techniques for urban development, we have only a limited knowledge of their effects on the city."[153] To this date, this does not seem to have changed and matters of inner-city telegraphy are still disregarded in favour of imperial or global issues.[154]

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[148] Diane Drummond, "The Impact of the Railway on the Lives of Women in the Nineteenth-Century City," in *The City and the Railway in Europe*, eds. Ralf Roth and Marie-Noëlle Polino (Aldershot: Ashgate, 2003).

[149] For instance, Anna Davin, "Women Telegraphists and Typists," in *Women in Industry and Technology. From Prehistory to the Present Day*, eds. Amanda Devonshire and Barbara Wood (London: Museum of London, 1996); Gregory J. Downey, *Telegraph Messenger Boys: Labor, Technology, and Geography, 1850 – 1950* (New York: Routledge, 2002).

[150] John Armstrong and David M. Williams, "The Steamboat and Popular Tourism," *Journal of Transport History* 26, no. 1 (2005); Alastair J. Durie, "Tourism and the Railways in Scotland: the Victorian and Edwardian Experience," in *The Impact of the Railway on Society in Britain. Essays in Honour of Jack Simmons*, eds. A.K.B. Evans and J.V. Gough (Aldershot: Ashgate, 2003).

[151] John R. Kellett, *The Impact of Railways on Victorian Cities* (London: Routledge and Kegan Paul, 1969); David Wragg, *Commuter City. How the Railways shaped London* (Barnsley: Wharncliffe Books, 2010); Neil McAlpine and Austin Smyth, "Urban Form, Social Patterns and Economic Impact Arising from the Development of Public Transport in London, 1840 – 1940," in *The City and the Railway in Europe*, eds. Ralf Roth and Marie-Noëlle Polino (Aldershot: Ashgate, 2003); Jack Simmons, *The Railway in Town and Country, 1830 – 1914* (Newton Abbot: David and Charles Publishers, 1986); David Turnock, *An Historical Geography of Railways in Great Britain and Ireland* (Aldershot: Ashgate, 1998).

[152] Joel A. Tarr, Thomas Finholt and David Goodman, "The City and the Telegraph: Urban Telecommunications in the Pre-Telephone Era," *Journal of Urban History* 14, no. 1 (1987).

[153] Ibid, 39.

[154] Wenzlhuemer, however, in his article on "Metropolitan Telecommunication," in which he seeks to trace the historical roots of today's digital divide, examines nineteenth-century London's connectivity patterns. Roland Wenzlhuemer, "Metropolitan Telecommunication. Uneven Telegraphic Connectivity in 19th-Century London;" *Social Science Computer Review* 27, no. 3 (2009).

Given the fact that this dissertation is primarily interested in the ways newly emerging transport and communication technologies were represented in Victorian media, publications addressing their reception in contemporary literature are of peculiar interest. Charles Dickens is certainly the most prominent English author frequently dwelling on the railway. Robin Atthill[155] and Helmut Viebrock[156] have thus focused on how Dickens portrayed the railway in his literary works. In this connection, Atthill has drawn the conclusion that "[t]wo contrasting moods predominate in Dickens's writings about the railway: the humorous and the horrific – the satirical and the sensational."[157] Ewald Mengel also dealt with *The Railway Through Dickens's World*,[158] yet he provided a mere compilation, rather than an analysis of texts from the magazines *Household Words* and *All the Year Round*, both of which were edited by Dickens. The lack of any analysis is somewhat deplorable, particularly taking into consideration that Mengel himself pointed out that "[a]n investigation of the image of the railway in *Household Words* and *All the Year Round* shows the many-sided, complex and contradictory reactions of Dickens's contemporaries towards the new means of transport."[159] Dickens also figured in Michael Freeman's *Railways and the Victorian Imagination*,[160] where he investigated, among other things, how railways were represented in contemporary art and literature. With electric telegraphy "[bringing] about changes in the nature of language, of ordinary knowledge, of the very structures of awareness,"[161] it is hardly surprising that these transformations have been subject of an increasing number of publications. Richard Menke's *Telegraphic Realism*, in which he examined nineteenth-century British fictional writing (and therefore also resorts to Dickens) and argued that "imaginative writing responds in crucial and defining ways to the nineteenth century's new media and the ideas they encouraged about information, communication, and language," is but one example of this kind of study.[162] Menke has not only considered how new information technologies were represented in contemporary literature, but has also shown how they transformed fictional writing – in the words of the author himself,

[155] Robin Atthill, "Dickens and the Railway," *English* 13, no. 76 (1961).
[156] Helmut Viebrock, "Dickens und das Dampfroß," in *Wirklichkeit und Dichtung. Studien zur Englischen und Amerikanischen Literatur*, eds. Ulrich Halfmann, Kurt Müller, and Klaus Weiss (Berlin: Duncker and Humblot, 1984).
[157] Atthill, "Dickens and the Railway," 134. Cf. also Viebrock, "Dickens und das Dampfroß," 82.
[158] Ewald Mengel (ed.), *The Railway Through Dickens's World. Texts from Household Words and All the Year Round* (Frankfurt am Main: Lang, 1989).
[159] Ibid., 3.
[160] Michael Freeman, *Railways and the Victorian Imagination* (New Haven: Yale University Press, 1999).
[161] James W. Carey, "Technology and Ideology: The Case of the Telegraph," *Prospects. An Annual of American Cultural Studies* 8 (1983):304.
[162] Menke, *Telegraphic Realism*, 3.

these are "cross-pollination[s] between imaginative writing and media innovation in nineteenth-century Britain."[163]

In what follows, I will briefly outline the key texts addressing the representation of nineteenth-century transport and communication technologies and their impact on contemporaries' perceptions and experience.

In a – sadly – rather short article on "Representations of Transatlantic Telegraphy," Colin Hempstead set out to investigate typical representations of the first transatlantic submarine cables in contemporary British and American prose, poetry and pictures.[164] His aim was twofold: on the one hand, he wished to trace how the public was familiarized with the cables spanning the North Atlantic. Analyzing the content of publications aimed at a general public (rather than at a professional audience), on the other hand, he argued that "we can learn of otherwise hidden social and political attitudes."[165] He has demonstrated that the accounts of the various transatlantic cable ventures were not provided in a vacuum, but were both "embedded (…) in existing social structures"[166] and "placed into the social, cultural and technological history of Western Europe."[167] Images repeatedly drawn upon include, inter alia, biblical and Shakespearean motifs, tales of explorations and progress, and patriotic lyric. As Hempstead has pointed out, it was in particular biblical and Shakespearean images that were most often resorted to, for instance in order to illustrate the speed at which messages were transmitted along the telegraph cables. An example given by Hempstead[168] is the following passage taken from the *Atlantic Monthly*, in which the author draws on Shakespeare's *Midsummer Night's Dream*:

> When Shakespeare made Puck promise to 'put a girdle round about the earth in forty minutes,' he undoubtedly supposed he would thereby accomplish a remarkable feat; but when the great Russo-American line *viâ* [sic] Behring's Strait and the Amoor is completed, and the Atlantic Cable is again in operation, we can put an electric girdle round about the earth before Puck could have time to spread his wings![169]

As Hempstead modestly noted in his final remarks, his examinations do not allow for any definite conclusion. Nonetheless, his study has inspired this dissertation and informed its research objectives. Rather than analyzing the representation of the

[163] Ibid, 5.
[164] Colin A. Hempstead, "Representations of Transatlantic Telegraphy," *Engineering Science and Education Journal* 4, no. 6 (1995).
[165] Ibid., 25.
[166] Ibid., 18
[167] Ibid.
[168] Cf. ibid., 19.
[169] "The Progress of the Electric Telegraph," *Atlantic Monthly*, March 1860, 297.

transatlantic telegraph only, however, this dissertation investigates the representation of transport and communication technologies on a wider scale and, in so doing, will advance Hempstead's preliminary findings.

Stephen Kern's monograph on *The Culture of Time and Space* was first published in 1983.[170] With time and space being universal and essential categories, Kern considered them "particularly suitable as a framework for a general cultural history"[171] and therefore set out to illustrate how from "around 1880 to the outbreak of World War I a series of sweeping changes in technology and culture created distinctive new modes of thinking about and experiencing time and space."[172] The technologies Kern addressed included, *inter alia*, the telephone, wireless telegraphy, bicycles, x-ray and the automobile. Looking into coeval developments in the fields of, for instance, literature (for example the works of Joseph Conrad, Franz Kafka and James Joyce), painting (Pablo Picasso, Jean Metzinger) or philosophy (Karl Jaspers, Émile Durkheim, Henri-Louis Bergson), Kern attempted to illustrate how these technologies have jumbled up previously valid ideas of time and space and brought about new approaches and interpretations. In order to make his point, he firstly contemplated the 'nature of time', and subsequently examined how notions of the past, the present and the future were shaped by the respective technologies. After an interlude on 'speed', he dwelled on the 'nature of space', coping with issues such as form, distance and direction. Attempting to illustrate "how the changes in thinking about and experiencing these abstract philosophical categories were manifested in a concrete historical situation,"[173] he finally elaborated on the interrelation between new perceptions of time and space and the outbreak of the First World War.

Indeed, Kern has been given credit for having written "a thoroughly interesting book," which is described as being "bold and daring. In a world filled with safe, pedestrian, and narrow monographs, there must be preserved a place for such books."[174] One of the factors making the book so interesting was its truly international outlook; moreover, the way he traced how well-established political and social structures were called into

[170] Stephen Kern, *The Culture of Time and Space, 1880 – 1918* (Cambridge, MA: Harvard University Press, 2003).
[171] Ibid., 2.
[172] Ibid., 1.
[173] Ibid., 4.
[174] Frank M. Turner, review of *The Culture of Time and Space, 1880 – 1918*, by Stephen Kern, *The International History Review* 7, no. 3 (1985): 455.

question by what is conceived of as "potentially democratic technology,"[175]on the one hand, and new ways of thinking in both the sciences and the arts, on the other, was positively commented on. However, Kern has also met with criticism: Turner, for instance, has pointed out that the intellectual trends Kern drew upon mostly originated in countries which did not belong to the vanguard in terms of technological developments in the nineteenth century, such as Russia, Italy or Austria. In Great Britain, in turn, which was spearheading scientific and technological progress at that time, these movements were not particularly well-developed.[176]Furthermore, despite warning against monocausal technological determinism in the introduction,[177] Kern declared in the preface to the second edition that "[t]echnology offers a compelling way to explain cultural change."[178] He further pointed out that

> [c]ultural historians struggle to explain the gradual evolution of fluid concepts such as romanticism and realism that have no precise starting date and no specific material manifestation. Technologies like the telephone present no such problems. They begin to affect history at a relatively precise starting date and are things that can be touched or held. They also affect the masses and not just an esoteric readership, as did many modernist classics.[179]

This is astonishing, if not disturbing in many ways. To start with, emphasizing technologies' tangibility as reason for which they are particularly appropriate means to explain cultural change seems fairly naive. What is more, with Edgerton's claim in mind that analyses of the interrelation between technology and society should primarily deal with "technology which is in *widespread* use,"[180] [my italics] Kern's statement appears all the more crude, as he does not seem to take into account questions concerning the diffusion of a particular technology, access to it and its actual usage.

Wolfgang Schivelbusch, in turn, set out to examine the psychological effects train journeys had on contemporaries and was primarily interested in railways' impact on changing perceptions of time and space.[181] For this reason, he took a closer look at the experiences of various professional groups involved, such as businessmen, engineers and medical doctors, as well as the general public. Contrary to what the title indicates, though, the issue of changing perceptions of time, space and landscape (and related

[175] Ibid., 456.
[176] Cf. ibid., 457.
[177] Cf. Kern, *Culture of Time and Space*, 6.
[178] Ibid., xxiii.
[179] Ibid.
[180] Edgerton, "From Innovation to Use," 112.
[181] Wolfgang Schivelbusch, *Geschichte der Eisenbahnreise. Zur Industrialisierung von Raum und Zeit im 19. Jahrhundert* (München: Hanser, 1977).

phenomena, such as the introduction of unified railway time) has been dealt with in one single chapter only. Beyond that, Schivelbusch has looked into a wide array of other aspects related to train journeys, such as the question whether railways could possibly alleviate social distinctions, the potential effects travelling by train could have on passengers' health and how railway stations came to dominate cities and towns. These are certainly important facets which have all too often been disregarded in 'ordinary' railway histories, and Schivelbusch has quite rightly been given credit for having written an interesting book. Nonetheless, he also had to face harsh criticism: Owing to the wide array of topics covered, for instance, it has been criticized that the book was "neither tightly organized nor unified by a single overriding thesis"[182] and that it was therefore "a collection of essays [rather] than a well-organized reference work."[183]

As mentioned earlier, in her study on *Mobile Räume*, Regine Buschauer set out to examine the discourses on spatial transformations in the context of new transport, communication and information technologies. Drawing upon a wide range of material, such as nineteenth-century novels and letters, correspondence between governmental bodies or computer game instructions, Buschauer has shown that space was repeatedly declared to have been 'abolished', 'lost' or 'overcome'. She has therefore reinforced Edgerton's hypothesis that our thinking about technologies has roots that reach far into the past. What is more, though, she has also demonstrated that, rather than condensing the discourses on the spatial reconfigurations brought about by the various technologies, one needs to distinguish them: in the context of railways, for instance, questions of speed are at the heart of the discourse. Concerning telegraphy, network structures and questions of immaterialness are more important.[184]

With *Dark Light*, Linda Simon has presented a cultural and social history of electric technologies and the electrification taking place in the United States in the course of the second half of the nineteenth century: By means of newspapers, magazines and fictional writing, she has examined the reception of electrically driven inventions, with a focus on illumination. As indicated in the title, the author was first of all interested in the anxieties that arose in this context. She therefore paid particular attention to the contradictions between the enthusiasm with which electricity was hailed (including

[182] Anthony Esler, review of *The Railway Journey. The Industrialization of Time and Space in the Nineteenth Century*, by Wolfgang Schivelbusch, *American Historical Review* 93, no. 5 (1988):1296.
[183] J. H. White, review of *The Railway Journey. Trains and Travel in the Nineteenth Century*, by Wolfgang Schivelbusch, *Technology and Culture* 24, no. 3 (1983):515.
[184] Cf. Buschauer, *Mobile Räume*, 320.

medical treatments, which were quite popular among contemporaries in both North America and Europe), on the one hand, and the fact that it acquired belated foothold in American households, on the other. Starting point for her examination was the perception of the electric telegraph; further, she also considered responses to the telephone, the phonograph, first light bulbs and X-rays. Among the questions she addressed were: What did contemporaries actually know about electricity as a physical phenomenon? What did they think about the relationship between electrical and human energy? And what were the cultural legacies that had informed their reaction to electricity? In this context she also looked into belief systems of the time, such as spiritualism, vitalism and mesmerism, thus embedding these anxieties over electricity into "a much larger anxiety about the place of the immaterial within an world [*sic*] of science increasingly dominated by matter."[185] What is more, Simon highlighted that this was not only a book about nineteenth-century responses to electric technologies. Rather, it addressed questions that are still valid more than a century later, for,

> truth be told, we, too, worry about invisible emanations – from power lines or from the cell phones that we carry with us everywhere. New technologies unsettle us. (…) Many of us have inherited from our nineteenth-century forebears some cherished assumptions: that nature will and must keep its secrets, that humans should not transgress, that nature will enact punishment against those who try to control it or probe too closely.[186]

The book offered interesting insights into the perception of electricity, but, given the fact that the author herself has repeatedly pointed out that the book addressed topics that are of paramount significance for us to understand the world we live in today, it is somewhat disappointing that she has not dwelt on the similarities (and differences) between past and present any further.

In his recent publication *Connecting the Nineteenth-Century World*, Roland Wenzlhuemer has investigated the multilayered interrelations between actors and network technologies, using the global telegraph network of the nineteenth century as a case study. In so doing, his aim was to study "the actors of late nineteenth-century processes of globalization embedded into global communication structures." [187] Combining quantitative and qualitative methods and looking at statistical data and network maps as well as letters, diaries, newspaper articles and cartoons, he aimed for

[185] Carolyn Thomas de la Peña, review of *Dark Light. Electricity and Anxiety from the Telegraph to the X-Ray*, by Linda Simon, *American Historical Review* 110, no. 3 (2005):806.
[186] Simon, *Dark Light*, 10.
[187] Wenzlhuemer, *Connecting the Nineteenth-Century World*, 25.

an "integrated perspective."[188] The underlying questions he sought to answer were, on the one hand, to what extent structures of a network are informed by the specific functions a technology performs, and, on the other, how these structures in turn affect the ways in which actors utilize this particular technology. Within this framework, he addressed – among other things – the question to what degree and in which ways telegraphic communication had an effect on contemporaries' experiences and thoughts. He was, for instance, interested in whether perceptions of time and space changed, to what extent language was influenced and whether tensions between established social and cultural practices, on the one hand, and the opportunities and/or limitations inherent to the technology, on the other, emerged. The following example illustrates how the interplay of qualitative and quantitative methods can provide useful insights: analyzing the shipping information which was regularly published in the *Times* and which provided information about incoming ships and their date of arrival, Wenzlhuemer was able to illustrate that global communication times shrank in the second half of the century and were no longer necessarily related to geographical distance. At the turn of the century, geographic space and (what Wenzlhuemer refers to as) global communication space were therefore no longer congruent.[189] Such structural changes, in turn, came to be reflected in contemporaries' perception of the world they lived in. This is illustrated in a letter to the editor published in the *Times* in December 1870.[190] In this letter, a gentleman who "had occasion to telegraph to Calcutta"[191] describes what seems like an absurd odyssey through the maze of post and telegraph offices in Central London and the multifarious problems he encountered when all he wished to do was to telegraph to the capital of British India. Reading between the lines, it becomes apparent that, due to its integration into the global communication infrastructure, the gentleman seems to perceive Calcutta to be much closer to London than other, less integrated places (despite them being closer to London in terms of geographic space). (I will come back to this example at a later point, see chapter 5.)

Combining these different types of source material, Wenzlhuemer has thus been able to draw a vivid picture of how the nineteenth-century global telegraph network informed perceptions of space and influenced contemporaries' everyday experiences.

[188] Ibid., 21.
[189] Cf. ibid., 126-128.
[190] Cf. ibid., 97-99.
[191] "The Post Office and the Telegraphs," *The Times*, 7 December 1870, 6.

Analyzing nineteenth-century transport and communication technology's media representation, this dissertation also seeks to contribute to the growing body of research on the ways in which these informed and transformed contemporaries' everyday experiences and perceptions. As set out earlier, it aims at providing a more comprehensive analysis, though, in the sense that it looks at newspapers and other printed material aimed at various strata of society. In so doing, it will also make a valuable contribution to the field of Victorian studies in general, and Victorian cultural history in particular.

As Susie Steinbach remarks aptly, "[h]istorians have been attempting to provide overviews of Victorian Britain for a long time."[192] At this, she points out, both temporary boundaries as well as geographic foci have varied. With the nineteenth century witnessing the formation of Britain's political parties and the piecemeal extension of franchise throughout the century, it is hardly surprising that questions of political thought and procedures have attracted scholarly interest.[193] Similarly, imperial and economic issues have steadily received attention, and the nexus between the two[194] has also been subject to examination. Asa Briggs' *The Age of Improvement* certainly is of particular interest in this context: although the first edition was published in 1959 and the book covers what the author himself calls the "'unconventional' period"[195] between 1783 and 1867, it is still one of the most comprehensive works on (at least a part of) the Victorian era, the author interweaving all of the issues mentioned above.

Along with this distinct interest in political, economic and imperial history, Victorian mindsets and mentalities have also been paid attention to from very early on. Already in 1936, Young engaged in drawing the *Portrait of an Age* and was particularly concerned with contemporaries' perceptions and attitudes towards the world they lived in, as for him, "the real, central theme of History is not what happened, but what people felt about it when it was happening."[196] This is particularly interesting in light of the fact that Young is more interested in the inconsistencies and ruptures, rather than in finding

[192] Susie L. Steinbach, *Understanding the Victorians: Politics, Culture and Society in Nineteenth-Century Britain* (London: Routledge, 2012), 1.
[193] For example: Bruce Coleman, *Conservatism and the Conservative Party in Nineteenth-Century Britain* (London: Arnold, 1988); Terence A. Jenkins, *Parliament, Party and Politics in Victorian Britain* (Manchester: Manchester University Press, 1996); H. Stuart Jones, *Victorian Political Thought* (Basingstoke: Macmillan, 2000).
[194] For example: Duncan Bell (ed.), *Victorian Visions of Global Order: Empire and International Relations in Nineteenth-Century Political Thought* (Cambridge: Cambridge University Press, 2007).
[195] Asa Briggs, *The Age of Improvement, 1783 – 1867* (Harlow: Longman, 2000), 1.
[196] G. M. Young, *Victorian England. Portrait of an Age* (London: Oxford University Press, 1977), 18.

overriding and unifying characteristics of the age. Consequently, Young's picture of England under Victoria's reign is complex and multilayered, "a dazzling chiaroscuro, an intricate network of themes and counterthemes blending to form a masterly work of art which successfully conveys a sense of the organic life of Victorian England."[197] In spite of such praise, though, there are some aspects the reader should be aware of: firstly, Young's *Portrait* is, as the title indicates, one of Victorian *England* rather than *Britain*. Secondly, as the author's focus is on a liberal and highly educated middle class, the *Portrait* shows only a very limited fraction of English society of the time. Moreover, more than other books on the Victorian period, the *Portrait* has to be seen as a product of the particular period during which it was written: in the early twentieth century and particularly after the First World War, the Victorians were looked down upon – first and foremost by the so-called Bloomsbury Group – for what was deemed naivety and hypocrisy. This only came to change thirty years later, when Britain had to come to terms with seemingly insurmountable economic and political problems. The era under the reign of Queen Victoria then came to be remembered as a time of political stability and a period in which Great Britain was internationally held in high esteem for its role as a global superpower. Readers should therefore keep in mind that, in writing the *Portrait*, Young

> intended to convey a message to his contemporaries who were grappling with the problems of the inter-war years. The *Portrait* contains a warning: only by re-capturing the vigorous and flexible intelligence of their early and mid-Victorian past can the English safely step into the future.[198] [italics in original]

In 1949, *Ideas and Beliefs of the Victorians* was published as an accompanying volume to the eponymous radio series that had been broadcast by the BBC Third Programme throughout 1948.[199] The circumstance of the book being published as an accompanying volume should be taken into account in order to understand its structure and extent: As highlighted in the preface, "broadcasting is essentially discontinuous. In a sense it should be so. Each item heard should be a completed experience."[200] Therefore, although contributions to the series were meant to adhere to a "unifying principle,"[201] each piece should be self-contained in the sense that the audience could listen to it

[197] James A. Colaiaco, "The Historian as Insider: G. M. Young and Victorian England." Review of *Victorian England: Portrait of an Age*, by G. M. Young, *The History Teacher* 16, no. 4 (1983):530.
[198] Ibid., 525.
[199] British Broadcasting Corporation, *Ideas and Beliefs of the Victorians. An Historic Revaluation of the Victorian Age* (London: Sylvan Press, 1950).
[200] Harman Grisewood, foreword to *Ideas and Beliefs of the Victorians. An Historic Revaluation of the Victorian Age*, by the British Broadcasting Corporation (London: Sylvan Press, 1950), 9.
[201] Ibid.

without getting the impression they were lacking elementary knowledge from earlier broadcasts.[202] The contributions to the radio programme – and the companion volume, accordingly – were arranged in five categories: 'Theory of Progress,' 'Victorian Religious Belief and Controversy,' 'Man and Nature,' 'The Liberal Idea,' and the somewhat vaguely formulated ''Working out' of Victorian Ideas.' Rather than covering what can be considered conventional aspects only, topics such as sexuality in the Victorian era or biographies of well-known personalities were also included in order to attract the widest possible audience. This approach, on the one hand, presents an advantage in the sense that it offers patchwork-like insights into a wide spectrum of topics interwoven with one another. Contributions dwelling on the roots and proliferation of the idea of progress, for instance, are completed by pieces on the relationship between man and nature and its representation in contemporary works of art (although it is questionable if radio listeners were able to relate all these contributions to one another). At the same time, though, this approach is one of the major shortcomings of the book: owing to the specifications concerning the content of the programme (in terms of discontinuity of broadcasting, self-containment of the single contributions and lack of narrative structure) the patchwork remains somewhat fragmentary and unconnected in spite of the many different topics covered.

In 1957, Walter Houghton set out to examine the *Victorian Frame of Mind*,[203] attempting to explore

> those general ideas and attitudes about life which Victorians of the middle and upper classes would have breathed in with the air – the main grounds of hope and uneasiness which they felt, the modes of thought and behavior they followed, often spontaneously, the standards of value they held – in a word, the frame of mind in which they were living and thinking.[204]

As Houghton pointed out, such examination of the *Victorian Frame of Mind* is of particular importance, for "to look into the Victorian mind is to see some primary sources of the modern mind."[205] Following a brief introduction on what he considers the 'Character of the Age,' Houghton addressed the emotional, intellectual and moral

[202] The instructions given to the research assistant in preparation of the show thus read as follows: "We do not aim at completeness, nor yet at narrative. People are easily interested by personalities and we envisage making some use of the biographical method in the broadcast result. It would be useful, therefore, obviously to use certain persons and their lives, letters and conversation to exemplify certain trends and aspects of the period." Ct. in ibid., 11.
[203] Walter E. Houghton, *The Victorian Frame of Mind, 1830 -1870* (New Haven: Yale University Press, 1957).
[204] Ibid., xiii f.
[205] Ibid., xiv.

attitudes of the Victorians. At this, he concentrated on the period from 1830 to 1870 (following prominent predecessors such as Young[206]) and dealt with, among other things, 'Optimism and Anxiety', 'Dogmatism' or the 'Commercial Spirit'. Houghton's survey being based on "literature in the broad sense"[207] it is first and foremost intellectuals, such as Arnold, Carlyle and Huxley, that are being heard and which Houghton regarded as representative of both the upper and middle class. Similar to Young, Houghton explicitly did not consider the "working class as such,"[208] and it is therefore once again only a particular section of Victorian society the reader is introduced to.

David Newsome's *The Victorian World Picture* is yet another and much more recent attempt to come to terms with *Perceptions and Introspections in an Age of Change.*[209] The questions Newsome addressed are as follows:

> How did the Victorians observe their own times? What troubled or excited them, as they looked at their internal problems and crises? How did they see themselves and their country in relation to what was happening in Europe and elsewhere? What did history tell them as a guide to the future (when they looked 'before and after', in fact)?[210]

Newsome, like Houghton, highlighted that contemporaries were well aware they lived in times of profound changes and therefore emphasized that the Victorian world picture must be a collage and a moving picture "rather than an ordered composition."[211] He also addressed the problem of representativeness, pointing out two things readers should keep in mind: firstly, the issue of regional variations, for even *within* England there were distinct local identities, let alone Scottish and Welsh ones; and secondly, the question of how the attitudes and world views of the lower classes could be brought to the fore. Despite these efforts, it was in this context that Newsome encountered criticism for what was considered a narrow focus on certain strata of society: "When treating the class frictions that constituted the intellectual, religious and political elites, Newsome is on firm ground. These apparently were the real Victorians; we are left

[206] As Hewitt points out, throughout the first half of the twentieth century, historians usually subdivided the Victorian age into an early and a late period. The year 1870 was usually viewed as a turning point, and generally speaking, the early Victorian period has received much more scholarly attention. Cf. Martin Hewitt, "Introduction: Victorian Milestones," in *The Victorian World*, ed. Martin Hewitt (London: Routledge, 2012), 3f.
[207] Houghton, *Victorian Frame of Mind*, xv.
[208] Ibid., xvi.
[209] David Newsome, *The Victorian World Picture. Perceptions and Introspections in an Age of Change* (New Brunswick: Rutgers University Press, 1997).
[210] Ibid., 5.
[211] Ibid., 12.

unsure about the rest of the population."[212] Nonetheless, Newsome is considered to be the "G.M. Young *de nos jours*"[213] [italics in original] and readers new to the topic are advised that, before venturing on Young's *Portrait*, they should consult Newsome's *Victorian World Picture*.

This dissertation by no means attempts to provide a similarly comprehensive overview over Victorian zeitgeist. As Newsome has pointed out, though, "the massive advance of technology and industrialization which was visibly reshaping both the landscape and the social structure of the country" had "a most powerful impact"[214] and was one of the distinguishing features of the Victorian era. Examining the media representation of transport and communication technology, one will therefore undoubtedly gain insights into Victorian mindsets in a wider sense, and this dissertation can therefore make a valuable contribution to the research on Victorian ideas and beliefs.

1.5 Chapter Structure

This introductory chapter took passages from Jules Verne's *Around the World in 80 Days* as point of departure to illustrate the general public's excitement about nineteenth-century transport and communication technologies and the ways in which they seemed to make the world a smaller place. It illustrated that – despite a large body of scholarly publications on transport and communication technologies and their application in various fields – contemporaries' attitudes and expectations towards these technologies have not been researched sufficiently. Further, it identified the questions this dissertation seeks to answer. The chapter also elaborated the relevance of this dissertation and outlined both the significance of nineteenth-century newspapers and periodicals as primary sources and how the vast amount of material available had been rendered manageable.

Chapter 2 traces the historical development of the global transport and communication infrastructure with a focus on the North Atlantic and the various routes between Great Britain and India. The chapter illustrates that the establishment of these new channels of transport and/or communication was a cumbersome affair, rather than a smooth and

[212] Rohan McWilliam, review of *The Victorian World Picture: Perceptions and Introspections in an Age of Change*, by David Newsome, *Victorian Review* 24, no. 1 (1998): 95.
[213] Ibid., 96.
[214] Newsome, *The Victorian World Picture*, 3.

steady process. Drawing on contemporary commentatorship, it illustrates the commercial and political rationale of the various actors involved in these processes. In so doing it offers a detailed account of the problems and conflicting interests, which is necessary in order to provide for a critical reading of the source material.

Introducing different approaches towards the relationship between technology and society, Chapter 3 provides a basic analytical framework. To begin with, it addresses the concepts of technological determinism, on the one hand, and the social determination of technology, on the other, and highlights why these are no longer deemed suitable to describe and analyze this relation sufficiently. Subsequently, the chapter outlines a sociological understanding of technology and briefly introduces relevant aspects of Actor-Network-Theory, both of which take into account the actual application of technology (albeit in different ways). My contention is that the Victorian understanding of the relationship between technology and society exceeded the technological determinist and somewhat naive beliefs that are ascribed to them nowadays. It is therefore essential to examine what could be described as the 'conventional' accounts of Victorian approaches towards technology. This chapter will present differing versions of the apparently axiomatic Victorian belief technology would inevitably bring about certain developments and ramifications; it will outline the intellectual movements which informed them, and it will examine the central concepts involved, such as the belief in progress and the subjugation of nature.

Chapters 4 to 7 provide a critical reading of the source material, with chapter 4 directly drawing on the preceding chapter. It attends to the notion of progress, human dominion over nature and the 'technological sublime'. In so doing – and in line with Hempstead's findings – it also investigates to what extent transport and communication technologies were embedded into social and cultural history and sets forth the reasons for this.

Chapter 5 focuses on the shifting perceptions of time, space and distance brought about by new transport and communication technologies. It starts with a brief introduction to various concepts of space and illustrates the interplay between media of transport and communication, on the one hand, and perceptions of time, space and distance, on the other. The chapter argues that the idea of the annihilation of time and space, which is often considered to be contemporaries' attempt to 'conceptualize' changing spatio-temporal arrangements, is rather to be viewed in terms of the subjugation of nature. Further, it detects an alternative and much more sophisticated approach to and

understanding of how contemporary transport and communication technologies transformed perceptions of time and space.

Addressing the question to what extent technologies of transport and communication were considered to be 'tools of peace', chapter 6 explores whether Victorian contemporaries' ideas concerning technology's 'impact' reached beyond technological determinist approaches. For this purpose, the chapter first of all investigates whether rapid communication was necessarily beneficial as concerns international conflict situations and demonstrates that, at times, swift exchange of information could indeed make the situation worse. In the subsequent analysis of relevant media content, it ponders if contemporaries were aware of this and, if so, how they addressed this issue.

Chapter 7 focuses on the role technological achievements, specifically transport and communication technologies, played in the context of national identities and interstate rivalries. For this purpose, it briefly contemplates the formation of national identities and the factors that are generally most significant in this context, before it looks into the core features of British national identity. In this chapter, reporting on the Great Exhibition and the way other countries and cultures were presented will be of particular significance. Further, the ways in which the Suez Canal and the Mont Cenis Tunnel were reported will be investigated more closely.

The concluding chapter integrates the various topics addressed previously with a view to the dissertation's main questions set forth in the introduction. In conclusion, it points to questions which should be addressed in future studies.

2. Of Iron Horses and Floating Towns – The Development of Global Transport and Communication Infrastructure in the Nineteenth Century

In the nineteenth century, what is often referred to as a transport and communication revolution[215] occurred. Given the fact that infrastructure had developed steadily during the previous century, the term 'revolution' may be slightly inappropriate. These earlier improvements, however, had reached their limits and new technologies were needed in order to reduce transmission times further.[216] The new technologies filling this gap in the nineteenth century were the steam engine (with its effects on both land and marine transport), on the one hand, and electric telegraphy, on the other.

Searight, dwelling on the opportunities steam engines and the resultant transport technologies promised in the nineteenth century, draws a vivid picture of the spirit of the time:

> Steam was thrilling because it was obvious almost at once that it was going to give wings to ordinary men and women. People brought up to be stationary were bewitched by the movement, the sight and sound of a steam engine. (…) Soon it was opening up continents, melding provinces into nations, shifting populations across the world – and also aiding and confirming military conquest. Men had discovered that he was born to go faster.[217]

Although this statement should be treated with some caution, it illustrates aptly that there was hardly any other invention which had so profound an influence on transportation (and, by extension, also on communication) as the steam engine.

In 1712, Thomas Newcomen devised what was later to become known as the Newcomen steam engine; although it worked more efficiently than the preceding atmospheric engines, it still was economically unviable. More than half a century later, James Watt improved Newcomen's engine decisively and made it more efficient. The first factory producing steam engines was founded in 1774, and "[i]n the phraseology of the time the glorious day of steam had arrived:"[218] Steam engines were gradually improved in the years to follow, and by the end of the eighteenth century, around 5000

[215] Cf. Standage, *The Victorian Internet*, 2; Headrick, *Invisible Weapon*, 4; Anton Huurdeman, *The Worldwide History of Telecommunications* (Hoboken, New Jersey: John Wiley and Sons, 2003), 145.
[216] Cf. Kaukiainen, "Shrinking the World," 20.
[217] Searight, *Steaming East*, 2.
[218] Ibid., 7.

steam engines were in use in England.[219] At that point in time, however, the majority of steam engines was still stationary, "[b]ut the impetus to apply steam to movement quickly grew."[220]

On the following pages, the evolution of steam-propelled transport both on land and on water will be traced. For the sake of a clear arrangement, the development of steamships and railways will be outlined separately. Concerning the former, I will provide an overview over their development from the early nineteenth century onward and highlight the most significant improvements as to the passage across the North Atlantic, on the one hand, and the establishment of constant and reliable steam communication with India, on the other. In this context, I will also outline the development and ramifications of the Suez Canal. Concerning railways, I will briefly depict the development of a continental railway network and the attempts of establishing a direct connection between Europe and India, before I focus on the Mont Cenis Tunnel and its effect on communication between Great Britain and the subcontinent.

2.1 Steamships

Writing on developments and improvements of transport to and communication with India in the nineteenth century, Headrick asserts in a rather laconic way that "[b]y the mid-fifties the once arduous and risky trip to the Orient had become fast and comparatively easy."[221] The development of steamships and the resultant opening up of new routes, however, was not as straightforward as this statement implies. Instead, it was characterized by trial and error and conflicting interest of the protagonists involved.

Hardly surprising, there were several routes to India. The decision which route to use hinged on the naval technology available at the time and the political situation in the Middle East.[222] From a British point of view, the most important route in the era of sailing ships was the one circumnavigating the Cape of Good Hope (usually referred to as the Cape route), which was "a highway dominated by English ships and marked by English way stations."[223] This was mostly due to the fact that there was no time-consuming transshipment required on this route. Moreover, as a result of the Napoleonic

[219] Cf. Walter Conrad (ed.), *Geschichte der Technik in Schlaglichtern* (Mannheim: Meyers Lexikonverlag, 1997), 45.
[220] Searight, *Steaming East*, 6.
[221] Headrick, *Tools of Empire*, 139.
[222] Cf. ibid., 132.
[223] Hoskins, *British Routes to India*, 80. Hoskins also points out that, strictly speaking, there was no such thing as one single Cape route, but a variety of different approaches. Cf. ibid, 84f.

Wars, Britain had obtained unchallenged global naval superiority, which meant that the circumnavigation of the Cape was a relatively safe journey. The voyage to India around the Cape was a lengthy one, though: In 1825, a one-way trip from London to Calcutta would require between four and eight months. Because of the monsoons, which inhibited year-round navigation on this route, a round trip between London and Calcutta – and thus the time it took before one could expect a reply to any kind of correspondence – could amount to two years.[224] Furthermore, the long duration of the journey posed other problems, concerning, for instance, logistics (food supply) and passengers' health (outbreak of scurvy).[225]

Other possible routes to India were generally referred to as 'overland routes', one leading from Europe via the Mediterranean to Syria, through Mesopotamia and subsequently down the Persian Gulf to India (also called the 'direct' route);[226] the other one crossing the Mediterranean towards Egypt, and, after transshipment and the crossing of the Isthmus of Suez on land, further towards India via the Red Sea. There were drawbacks inherent to both of these routes, too: travelling along the direct route, one had to traverse the Ottoman Empire, facing "xenophobic Arab tribes and unreliable Turkish administrators,"[227] whereas the Red Sea route, with its capricious winds and abrupt storms, was hardly navigable for sailing ships.

As a result, the Cape route was the most popular route to the East at the beginning of the nineteenth century. The introduction of steamships, however, would in the long run change these preferences and open up entirely new opportunities.

In the North Atlantic – which was not only the most trafficked, but also the most perilous sea passage[228] – so-called packet lines had been established in the early nineteenth century, offering the advantage of regular service. Not only were they considered to have introduced an unprecedented level of comfort; what is more, they made journeys more reliable, as they would leave port at a scheduled date, rather than waiting for a sufficient amount of cargo and number of people aboard before casting off (which had previously been common practice). In the 1830s, the journey from New York to Liverpool amounted to around 24 days, while the return trip would take about

[224] Cf. Headrick, *Tools of Empire*, 132.
[225] Cf. Hoskins, *British Routes to India*, 82f.
[226] Cf. ibid, 154.
[227] Headrick, *Tools of Empire*, 132.
[228] Cf. Fox, *Transatlantic*, xii.

38 days.[229] These sailing ships, though, were after all subject to weather conditions and therefore prone to delays: the departure date was fixed, but the actual length of the journey was still uncertain.

2.1.1 From Wood to Iron – Early Developments and First Atlantic Crossings

Technological developments do not just 'happen', but are fostered by certain social, cultural or economic factors. Hardly surprising, this is also the case concerning the emergence of steamships. Their development was closely intertwined with industrialization processes and the growth in trade from the late eighteenth century onwards, which necessitated and promoted a new type of ship. Given the fact that India had become of central importance for the maintenance of British economy, both the routes and modes of transport to and communication with the subcontinent were of paramount significance. Headrick therefore considers the "entrepreneurs who handled this trade [to be] the catalysts of improved communications in the nineteenth century."[230] For their purposes, the long journey around the Cape of Good Hope would only do for the shipment of goods; communication and the exchange of important business information depended on more efficient channels. Besides such economic aspects, there was also a political rationale: Napoleon's policy of expansion towards the East gave the British an understanding of the significance of improved and speedier means of communication with the Indian subcontinent. Moreover, an increasing number of British clerks and businessmen resided in India, longing for speedy channels of communication so that they could keep in touch with their loved ones back home.[231]

Despite earlier attempts of propelling ships by steam power, it was only in the early years of the nineteenth century that marine steam propulsion made noteworthy progress.[232] Although the *Charlotte Dundas*, designed by the Scottish engineer William Symington in 1802, is considered the first practical steam vessel,[233] the *Clermont*, built by Robert Fulton and Robert Livingston in New York City (equipped with a British

[229]Cf. ibid,, 6; Spratt provides similar data (23 days eastward and 40 westward); cf. Hereward Spratt, *One Hundred Years of Transatlantic Steam Navigation, 1838 – 1938* (London: Science Museum, 1938), 5.
[230] Headrick, *Tools of Empire*, 133.
[231] Cf. Hoskins, *British Routes to India*, 85 -87.
[232] In the last quarter of the eighteenth century, more experiments with steam-propelled vessels had been carried out: Perrier's ship, steaming on the River Seine in 1775, is considered the first vessel actually propelled by steam power; similarly, both the Frenchman Claude François Marquis de Jouffroy d'Abbans and the American John Fitch carried out experiments in the late eighteenth century. Cf. Basil W. Bathe, *Seven Centuries of Sea Travel. From the Crusaders to the Cruises* (New York: Portland House, 1990), 108; Conrad, *Geschichte der Technik*, 148.
[233] Cf. Bathe, *Seven Centuries of Sea Travel*, 108.

engine, though) in 1807 is looked upon as the first commercially *successful* steamship.[234] Both the *Charlotte Dundas* and the *Clermont*, as virtually all steamships to be built in the following three decades, were paddle steamers, as the method employing wire ropes to move oars had turned out to be rather wasteful and prone to disruptions.[235]

In contrast to the rapidly increasing number of steamships in the United States, the development in the British Empire was comparatively slow: by 1819, there were around 100 steam vessels in the United States; in the entire British Empire, there were only a meagre 43.[236] Nonetheless, services improved steadily; in 1812, the *Comet* was taken into service between Glasgow and Helensburgh.[237] In 1816, the *Margery*, which had been in operation on the river Thames since 1815, was to become the first steamship to cross the English Channel; the same year, a service across the Irish Sea was inaugurated.[238] A regular steamer service across the English Channel was introduced in 1822, and by 1825, there was an "extensive system of steamship services around the British Isles and to Europe."[239] While steam-propelled vessels had soon become widely accepted means of transport in terms of inland and coastal navigation, they were still not deemed suitable for the open sea.[240] As a result, ocean-going vessels would still be equipped with masts carrying sails.[241]

One of these ships equipped with both spread of sails and steam engine was the *Savannah*. The first crossing of the Atlantic under steam is often attributed to this hybrid ship, although, on her trip from Savannah, Georgia, to Liverpool in May 1819, she sailed for most of the time. In fact, steam propulsion was used for no more than 85

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[234] Cf. Ian Dear and Peter Kemp (eds.), *The Oxford Companion to Ships and the Sea* (Oxford: Oxford University Press, 2005), 112. In the aftermath of the *Clermont*'s first trip, the number of steamships on North American canals and rivers increased steadily, from around 50 in 1812 to 300 in 1823 and 1000 on the Mississippi by 1840; cf. Conrad, *Geschichte der Technik*, 148.

[235] Cf. Conrad, *Geschichte der Technik*, 148.

[236] Cf. Edgar C. Smith, *A Short History of Naval and Marine Engineering* (Cambridge University Press, 1938), 16.

[237] Cf. Ian McNeil, "Introduction. Basis Tools, Devices and Mechanisms," in *An Encyclopaedia of the History of Technology*, ed. Ian McNeil (London: Routledge, 1990), 35.

[238] Cf. Bathe, *Seven Centuries of Sea Travel*, 118.

[239] A. W. H. Pearsall, "Ports and Shipping," in *An Encyclopaedia of the History of Technology*, ed. Ian McNeil (London: Routledge, 1990), 527.

[240] On the one hand, there were technical problems, such as salt water causing crustification on boilers and pipes, steam pumps being rather unreliable, and maintenance of machinery calling for regular stopovers. The paddle-wheels gave concern, too, as they seemed unsuitable for navigation on the high seas. On the other hand, there were logistic considerations to be taken into account: steam engines were everything but efficient and therefore needed enormous amounts of coal, a sufficient supply of which either had to be bunkered on board (wasting valuable cargo space) or provided en route (set up by sailing ships up front); Cf. Hoskins, *British Routes to India*, 88; Headrick, *Tools of Empire*, 131.

[241] Cf. Bathe, *Seven Centuries of Sea Travel*, 117.

hours.[242] Despite the many problems and limitations inherent to steam-propelled ships, the *Savannah* demonstrated that it was indeed possible to employ steamships on the open sea. Consequently, numerous 'hybrid ships' crossed the Atlantic in the following years, but not one of them would do so on steam power only.[243]

It was only in 1838 that both the *Sirius* and the *Great Western* traversed the Atlantic powered by steam alone, the latter crossing the ocean in little more than 15 days.[244] Isambard Kingdom Brunel had previously solved the problem of efficiency and had designed the *Great Western* specifically for ocean crossings. Indeed, compared to other steamships, she turned out to be a thorough success in terms of efficiency: The *Sirius* had run out of fuel towards the end of the journey and the crew had to burn parts of the interior fitting.[245] The *Great Western*, in contrast, entered port in New York with more than 40 tons of coal aboard.[246] Brunel had thus proven that, if only ships were designed appropriately, the problem of fuel supply for long journeys could be overcome. As a result, from 1840 onwards, regular steamship services crossing the Atlantic Ocean were introduced.[247]

Contemporaries were well aware of the significance of these first Atlantic crossings by steamships. The *Manchester Guardian*, for instance, reprints an article from the *Liverpool Times*, in which it is declared that "[i]t is a remarkable fact that the outward and inward voyage should have occupied the same time."[248] It is further pointed out that

> [t]his great saving of time, amounting on the voyage to America to more than a third, and on that from America to Europe to more than a fourth, cannot fail to produce an immense effect on the intercourse between the two continents, if the experiment should prove profitable, and regular lines of steam packets should be established. For all purposes of business and communication, (…) the utmost degree of regularity will be produced in the intercourse. In every point of view, the experiment is one of the most important ever tried, and the events of every year will furnish additional evidence of its importance.[249]

The *Scotsman* also considers the regularity steamships would introduce to be of particular importance:

> The benefit in the use of steam navigation is not to be estimated by the abbreviation it effects in the *mean* length of the voyage, but by the regularity it ensures. When a person sets foot in a Liverpool packet for New York, the probability is that his voyage

[242] Cf. Dear, *Oxford Companion to Ships*, 494.
[243] Cf. Headrick, *Tools of Empire*, 142.
[244] Cf. Bathe, *Seven Centuries of Sea Travel*, 127.
[245] Cf. Conrad, *Geschichte der Technik*, 149.
[246] Cf. Bathe, *Seven Centuries of Sea Travel*, 128.
[247] Cf. Headrick, *Tools of Empire*, 131.
[248] "Steam Navigation Across the Atlantic," *Manchester Guardian*, 23 May 1838, 3.
[249] Ibid.

> may be finished in 30 days; but it is quite possible, as experience shows, that it may be prolonged to 50. All who have business to transact; all to whom time is precious, or the sea a cause of sickness or ennui, will set an inestimable value on the punctuality of steam navigation, which offers a certainty of accomplishing the voyage within two or three days beyond the mean period, instead of twenty or thirty.[250]

Still, these early ocean-going steamships were economically unprofitable. For the ocean steamship to become a lucrative service, it had to be transformed in several ways. Iron hulls and propellers, for instance, were initiated in the late 1830s and offered various advantages: iron allowed for more suitable hull shapes and was less prone to infestations by water beetles and the like. The screw propeller, on the other hand, relieved ocean-going steamships from the aforementioned problems related to paddle-wheels and became the standard means of propulsion within a decade.[251]

The *Great Britain*, the second of Brunel's ocean-going vessels, came to epitomize these new developments. In the 1840s, the majority of emigrants to North America would still cross the Atlantic on sailing ships. The *Great Western Steamship Company*, eager to profit from this tide of emigration, commissioned Brunel to build yet another steamship. The *Great Britain* was the first steamship that was both built of iron and equipped with a screw propeller and, by extension, came to set new standards in shipbuilding. Launched in 1843, she was a "culmination of these new technologies"[252] and crossed the Atlantic in summer 1845 in what was then a record time of 14 days and 21 hours. Despite the fact that up to the 1860s, both sailing ships continued to play an important role in the North Atlantic and paddle steamers were built for this route, the *Great Britain* is considered to have ushered in the era of grand ocean liners.[253]

The *Great Eastern*, Brunel's third ocean-going steamer (launched in 1858), also set new standards and illustrated the enormous progress in shipbuilding that had been rendered possible by the introduction of iron. In light of the high number of people emigrating to Australia, the *Great Eastern* was designed with the idea in mind that she should be able to steam all the way to the Antipodes without having to recoal. With a length of around 700 feet, a designed tonnage of 18,195 (in comparison: previously, the largest vessels

[250] "Steam Navigation Across the Atlantic," *The Scotsman*, 11 April 1838, 3.
[251] Cf. Headrick, *Tools of Empire*, 145. Headrick also points out that the introduction of iron into shipbuilding was of particular importance to Great Britain: during the eighteenth century and in the context of the Napoleonic Wars, British forests had mostly been cut down and Britain hinged on timber imports from Scandinavia and North America, the latter threatening to outpace Great Britain in shipping trade. The introduction of iron into shipbuilding therefore helped "prolong[ing] the British shipbuilding and shipping supremacy for over half a century." Cf. ibid., 145f.
[252] Headrick, *Tools of Empire*, 145.
[253] Cf. Conrad, *Geschichte der Technik*, 150.

had a tonnage of no more than 5,000) and a top speed of 15 knots, she "dwarfed every other ship built before the twentieth century."[254] Her enormous size is repeatedly commented on in contemporary publications: The *Times* considers it "difficult, if not entirely impossible, for the mind to appreciate and realize its immense hulk at once,"[255] and the *Visitor's Guide to the Great Eastern* compares her to an "embattled town" and an "iron suburb of vast proportions."[256] Moreover, there was no other ship that was equipped with paddle-wheels, screw propeller and six masts. At the outset, the *Great Eastern* was therefore considered "the marvel of shipbuilding and engineering skill."[257] Prior to her launch, she was often referred to as the "mighty ship,"[258] "floating palace" or even "floating town."[259] However, the *Leviathan*, as the vessel was officially called, turned out to be ill-starred, with mishaps during her launch (which is why it was postponed several times) and explosions aboard once she was afloat. Moreover, her very size turned out to be a curse, rather than a blessing, as smaller ships were easier to control. Despite her being an outstanding piece of shipbuilding, she was finally considered a faulty design. She would later gain fame in the laying of the transatlantic submarine cable of 1866 and the Indian submarine cables in 1870, as she was, because of her very size, particularly suitable for an endeavour of that kind.

2.1.2 Steaming East – Steamships and Routes to India

The statement that the evolution of steamships and new routes was characterized by trial and error and many advancements occurring simultaneously, seems particularly appropriate with regard to the development of new channels of communication and transportation between Great Britain and India. Given the fact that there were different sea routes to India, but also because of the rivalry between the presidencies of Bombay and Calcutta, the development of these links is somewhat erratic. The most important developments will be depicted on the following pages.

For various reasons, travelling to India by steamship was considered a difficult and financially unviable undertaking at the outset of marine steam-propulsion. On the one hand, the lack of efficiency made the notorious circumnavigation of the Cape of Good

[254] Headrick, *Tools of Empire*, 143.
[255] "The Great Eastern," *The Times*, 30 April 1857, 12.
[256] Thomas Jackson, *The Visitor's Guide to the Great Eastern*, (Holyhead, 1860), 10.
[257]"The 'Big Ship'," *Illustrated London News*, 13 August 1859, 148.
[258] "The Departure of the 'Great Eastern'," *Illustrated London News*, 10 September 1859, 241.
[259] "The 'Great Eastern' Steam-Ship," *Illustrated London News*, 7 November 1857, 449.

Hope an unprofitable venture; steamships appeared to be of better use on the considerably shorter segments of the overland routes, where the distance that had to be covered amounted to less than a third of the Cape route. Due to the unsteady political conditions after the Napoleonic Wars, however, travelling along the overland routes was not necessarily a safe option either. Furthermore, the presidencies of Bombay on the one hand, and Calcutta and Madras, on the other, preferred different routes. Both Bombay government and merchants favoured the overland routes, as ships travelling along these would almost inevitably make the Western presidency their port of call. Calcutta's political elite and business community, however, preferred the option of steaming around the Cape of Good Hope, as from here vessels would more of less inevitably drift towards the East coast of the subcontinent.

In 1823, the Anglo-Indian community of Calcutta set up a so-called Steam Committee, which was shortly afterwards made the *Society for the Encouragement of Steam Navigation between Great Britain and India* and announced a reward of almost 70,000 rupees for whoever steamed the distance between Great Britain and India first before the end of the year 1826. Because of Calcutta's location in the East of the subcontinent and the long tradition of the Cape route, the *Society* clearly had the route around the African continent in mind.[260] The resolution that was approved of in December 1823 further explicated that this prize was only to be disbursed once four consecutive trips between Britain and Bengal had been carried out in less than 70 days each. James Henry Johnston's attempt to fulfil these criteria failed totally, though. For various reasons, the *Enterprize*, a wooden paddle steamer, reached Calcutta only more than 100 days after it had left Falmouth in August 1825 and therefore illustrated that, at this time, steamships were highly inappropriate for the Cape route.

In spite of this failure, decision-makers in the presidency of Bombay were still optimistic that steamships operating on the Red Sea route would accelerate communication between Europe and India; their aim was to make Bombay the "new gateway to India."[261] Mountstuart Elphinstone, Governor of Bombay from 1819 to 1827, had already been interested in the development of the Red Sea route and arranged for surveys of the Red Sea to be carried out by the Bombay Marine. His successor, John Malcolm, implemented Elphinstone's plans: The *Hugh Lindsay* left Bombay in March 1830 and arrived at Suez 33 days later (after having had to recoal once). Even though

[260] Cf. Hoskins, *British Routes to India*, 92f.
[261] Headrick, *Tools of Empire*, 134.

there were certain significant and undeniable drawbacks to this pioneering journey through the Red Sea – such as the high costs for fuel and the resulting question if the trip was commercially viable – it was successful with regard to the acceleration of communication between Great Britain and the subcontinent: the letters aboard the *Hugh Lindsay* reached England within 59 days.[262]

Nonetheless, rather than focusing entirely on the Red Sea route, a House of Commons Select Committee decided to give the so-called Euphrates route (through Mesopotamia and the Persian Gulf) a try. The trial exhibition of 1835 turned out a major disappointment, though, and was therefore officially terminated in January 1837. Even if it had been less unfortunate, simultaneous technological developments (such as the construction of the *Great Western*) would in all likelihood have undermined its findings anyway. Unsurprisingly, the report released by yet another Select Committee in 1837 "confirmed what was already obvious: the victory of the Red Sea Route."[263] In the following year, the Court of Directors made the Indian navy a steam service for both mail and passengers, and in the years to follow various other steamers were added on this route.[264]

Nonetheless, the Red Sea route still had its drawbacks at that time: once Suez had been reached, mails would be carried to Cairo and subsequently shipped to Alexandria via the River Nile. In Alexandria, though, they could be stuck for up to a month, before a merchant ship would take them to Malta, where the British Admiralty's steam service began – an immense waste of time for everyone waiting for urgent correspondence from the subcontinent.

In the end, it was a private company, the *Peninsular & Oriental Steam Navigation Company*, that promoted more rapid transport on the Mediterranean leg of the journey. From 1835 onwards, it had provided for a regular steam service between London and various seaports in Portugal and Spain, before it was awarded a contract to transport mail on these routes by the British Admiralty. From 1840 onward, it would also provide a steam service to Egypt. A journey from London to Alexandria – via Gibraltar, Malta, Athens, Smyrna, Constantinople, Rhodes, Beirut, and Jaffa – would take no more than 14 days. The 'P & O' would finally also extend its service to the Eastern leg of the journey, offering steam services to Calcutta first (as it was not allowed to operate from Bombay at the outset), and later also to Penang, Singapore, Hong Kong, and Australia.

[262] Cf. Hoskins, *British Routes to India*, 109.
[263] Headrick, *Tools of Empire*, 137.
[264] Cf. ibid., 138.

It could thus dwarf its competitor, the *East India Company*, whose only service was the one between Bombay and Suez.[265] Depending on seasonal weather conditions, the trip from Suez to Bombay would take another 18 to 27 days.[266]

The next step in the improvement of the overland route via Egypt was the construction of the Suez Canal, an undertaking which seemed hardly feasible in the beginning of the nineteenth century, but had been achieved by 1869.

2.1.3 The Suez Canal – Water Highway to the East

Since the official inauguration in November 1869, the Suez Canal has been of paramount significance for shipping between Europe, on the one hand, and South and East Asia and the Antipodes, on the other. Its development is of particular interest, as it was subject to the conflicting political motives of the Great Powers, most notably France and Great Britain. Especially for Great Britain, the construction of the canal was a double-edged sword: on the one hand, it promised a faster channel of transport and communication towards India, which, as the events related to the Indian Mutiny in 1857 had shown, was much needed. On the other hand, though, the risks inherent to such a scheme seemed incalculable as it was feared that the canal would directly impact on both political and commercial alliances and, by extension, weaken Great Britain's position as a global superpower. Despite the benefits a canal would offer and in sharp contrast with the needs and wishes of the British business community, Lord Palmerston therefore considered it to be to the detriment of British interests. The reasons for this disapproval can be found in British global policy, specifically the Eastern Question. The proceeding disintegration of the Ottoman Empire had raised the question of whether it should be divided, with Great Britain opting for its conservation. In this manner, the British hoped to put a stop to Russian expansionism in the East. The Oriental Crisis of 1840, sparked off by the attempts of Viceroy Muhammad Ali to create an independent Egypt, was in this context considered a

> double threat to [Britain's] imperial interests. Her communications with India had always, as she saw it, been menaced by Russia through Persia and Afghanistan; now

[265] Cf. Searight, *Steaming East*, 73-84.

[266] Cf.Wobring, *Globalisierung der Telekommunikation*, 88. John Sidebottom also provides an impressive amount of data concerning the overland stretch from Alexandria to Suez; he points out that in 1843, the journey from Alexandria to Cairo took between 15 and 20 hours, but no precise data are given as regards the stretch between Cairo and Suez. Nonetheless, Sidebottom illustrates that in 1835 the entire journey between Alexandria and Suez took around 60 hours. Cf. John K. Sidebottom, *The Overland Mail. A Postal Historical Study of the Mail Route to India* (London: Allen and Unwin, 1948), 79 and 159.

> they were menaced by France, through her dominance over an independent Egypt and Syria under French protection.[267]

However, the military defeat of Ali and the convention of 1840 (which reestablished Egypt as a province of the Ottoman Empire, but granted Muhammad Ali the status of a hereditary ruler) offered at least a temporary solution. It was for this reason, though, that the British government feared a canal across the isthmus might be a "global conception"[268] which, by cutting off Egypt from the Ottoman Empire and thereby altering the geography of the region, would facilitate Egypt's separation and, in all likelihood, cause considerable international tension. This view was also expressed in the *Times*:

> The neutrality of Egypt is an object of European importance. From time immemorial this marvelous country has played a part in the struggle for empire quite disproportional to its population or its own intrinsic value. (…) That Egypt should be independent of foreign influence and not subservient to the dictation of any Western State concerns the peace of the world, and this end is best secured by maintaining its dependence on Turkey.[269]

As a result, the British favoured a railway from Alexandria via Cairo to Suez: it would serve British purposes just as well and did not entail any of the complications inherent to the construction of a canal.[270] The *Times* accordingly points out that

> [t]he truth is, the roads to India are many, and the Isthmus of Suez does not offer the best. If the canal could ever be constructed, it might be destroyed by competition before it had been open a month. The sea is no longer the surest highway. In these days it is a principle of locomotion that a steamer should be exchanged for a railroad at the first practicable opportunity (…). The Euphrates Valley Railroad would leave the Suez Canal where a Suez Canal might leave the route round the Cape.[271]

It is in this context that the British government's change of attitude towards the construction of the canal has to be seen, from denying the sheer feasibility of the project as such and sabotaging it once construction works had begun, to aiming at control over it as soon as first ships had passed through it. In this respect, the Suez Canal differs clearly from the other technologies under examination in this paper.

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[267] Patrick Balfour Kinross, *Between Two Seas. The Creation of the Suez Canal* (John Murray, 1968), 45. In this context, Wilson points out how "French newspapers and public men vied with each other in pointing out the extent to which the canal would damage British interests." Arnold T. Wilson, *The Suez Canal. Its Past, Present, and Future* (London: Oxford University Press, 1933), 11.
[268] Kinross, *Between Two Seas*, 47.
[269] "There is a Mystery About the Suez Canal," *The Times*, 25 May 1861, 8.
[270] Cf. Kinross, *Between Two Seas*, 47. The Egyptian railway was opened in 1858, and even during construction, the British "maintained that with the completion of the line the canal would have no additional advantages to offer." Hoskins, *British Routes to India*, 319.
[271] "The Land of Egypt," *The Times*, 29 November 1862, 8.

As early as around 1850 BC, attempts to cut across the Isthmus of Suez were made for the purposes of both transport and irrigation, yet none of these undertakings turned out to be permanently successful. Nonetheless, interest in creating a linkage across the isthmus never ceased entirely. Eventually, in the scope of his Egyptian campaign of 1798, Napoleon arranged for surveys of the area: a waterway across the isthmus was considered an adequate means to hamper British access to India.[272] What is more, the opportunities a canal between the Red Sea and the Mediterranean might offer as to the acceleration of transport and communication became manifest after the *Hugh Lindsay* had steamed all the way from Bombay to Suez in 1830 and with the development of better steamships, for

> [i]n an otherwise easy journey, the passage through Egypt quickly proved to be the most serious bottleneck along the route to the East. Travelers had to spend eight to ten days of misery crossing the desert, camping out, or waiting in one of Suez's infamous squalid hotels.[273]

A direct canal was not considered viable at the time, though, for the surveys carried out during Napoleon's Egyptian expedition had – erroneously – shown that there was a significant difference of sea level between the Red Sea and the Mediterranean. Although later surveys rectified the notion of different sea levels, making it obvious that the construction of a canal would not be as complicated as had previously been assumed, not much was achieved in the following decades. This was partly due to the Egyptian Viceroy's disapproval of the project, but also to the fact that European rulers had to face the 1848 revolutions and were therefore sufficiently distracted for the time being. It was only when Said Pasha was made Viceroy in 1854 that the project received renewed attention. Ferdinand de Lesseps, a former French diplomat who had befriended Said Pasha earlier in his life, received a first concession for the construction of the canal in 1854, followed by a second one two years later. In this second concession, the international and neutral status of the canal was emphasized, and it was hoped this would ease British anxieties and prevent further animosities. Lesseps founded the *Universal Suez Ship Canal Company* (*Compagnie Universelle du Canal Maritime de Suez*), and shares were on offer from 1858 onwards. In order to emphasize the international character of the undertaking, contingents were reserved for Great Britain, Austria, the United States and Russia, but none of them was interested. For the French public, this international aspect of the canal was of subordinate importance. Instead it

[272] Cf. Wilson, *The Suez Canal*, 1-6.
[273] Headrick, *Tools of Empire*, 151.

was increasingly viewed as a "patriotic venture because of the outspoken hostility of the British Government."[274]

Construction works were finally commenced in April 1859, but, as it was only the Viceroy of Egypt who had issued a concession, and approval by the Ottoman suzerain was lacking, its political status was still unclear. Great Britain, meanwhile, was still anxious to impede the ongoing construction works and exerted pressure in Constantinople. Despite at least temporarily successful measures, in 1866 – that is, at a time when construction works were well advanced – the official *firman* was finally issued by the Ottoman suzerain.[275] Thereafter construction progressed more rapidly, and with the completion of the canal being inevitable, the British government's attitude began to change, for now it was imperative to find "ways of turning the new waterway to imperial account."[276]

The Suez Canal was finally opened on 17 November 1869, and although far from perfect at the time of inauguration (with sections of it not being deep enough and an insufficient number of sidings, just to name a few), it was easy to see that it would accelerate transport and communication between Britain and the subcontinent: the distance to be covered between Southampton and the Ceylonese port of Point de Galle was diminished from 11,650 miles (via the Cape route) to 6,515 miles;[277] similarly, the route London-Bombay was reduced by 51 percent, London-Calcutta by 32 percent and London-Singapore by 29 percent.[278] Accordingly, duration of transit was shortened, with estimates on savings ranging from 51 to 67 days between England and India compared to the Cape route, depending on various factors.[279] What is more, due to fuel savings, passage to India became significantly cheaper over the decades, from £ 140 via the overland route in 1843 to £ 68 in 1875.[280]

Accordingly, newspapers waxed lyrical about the newly opened canal: "What a future does it prophesy! What a new, and for the present incalculable, factor does it introduce

[274] Hoskins, *British Routes to India*, 353.
[275] Cf. Kinross, *Between Two Seas*, 211. For a full account of the diplomatic trials and tribulations, see Hoskins, *British Routes to India*, 305-320 and 343-367.
[276] Hoskins, *British Routes to India*, 363.
[277] Cf. ibid., 369.
[278] Cf. Headrick, *Tools of Empire*, 155.
[279] Cf. Hoskins, *British Routes to India*, 370. In comparison: When the *Hindostan*, a steamer commissioned by the P&O, steamed to Calcutta along the Cape route in 1842, the journey took 91 days. Cf. Searight, *Steaming East*, 83f. Headrick furthermore points out that, once electric headlights on ships had been introduced and nighttime traffic was possible, journey times would further decrease. Cf. Headrick, *Tools of Empire*, 155.
[280] Cf. Hoskins, *British Routes to India*, 370.

into the traffic of the world!"[281] *Lloyds Weekly Newspaper*, having called it "the most astonishing engineering work of modern days"[282] even before its opening, afterwards concluded that not only was the inauguration "[t]he event of the year 1869," but that the entire year "will remain the Suez Canal year."[283] However, despite this enthusiasm, there was also some skepticism towards the actual amount of traffic that would pass through the canal:

> That the Suez Canal has conferred upon the world an immense boon few, perhaps, will be inclined to dispute. It makes a vast addition to the material resources of mankind. Possibly, however, there is too hasty a predisposition to over-estimate the part it is destined to play in the accommodation and redistribution of commerce.[284]

Indeed, and despite the promising prospects mentioned above, the canal was not an immediate success, owing to several factors. Most importantly, as sailing ships could hardly use the canal and steamships built for the shorter distances of European waters were not apt for those east of Suez and vice versa, a new type of ship was needed. With improvements and adaptations in shipbuilding, however, the canal became increasingly popular over the years, and the number of ships navigating it grew from around 500 in 1870 to almost 1,500 in 1875 and more than 2,000 in 1880.[285] Moreover, from the beginning, the canal's significance to Great Britain's interests was blatant, with not only the very first ship passing through it in regular service being a British vessel, but also 75 percent of the vessels navigating it in the course of the subsequent years.[286] Already two days after the inauguration, the *Liverpool Mercury* pointed out that

> [n]o other European nation possesses a sufficient amount of trade with the East, or a sufficient number of vessels suited for the trade through the Mediterranean, down the Red Sea, and across the Indian Ocean, to be able to do much towards sustaining this new line of communication.[287]

Hoskins has therefore drawn the conclusion that despite the anxieties of the British Government and the resultant attempts to avert its construction, the Suez Canal was "from the outset (…) intrinsically British."[288]

However, at this stage, Great Britain was still anxious to ensure the permanent neutrality of the canal, and thus aimed for achieving influence, if not control, over it.[289]

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[281] "Opening of the Suez Canal," *Illustrated London News*, 27 November 1869, 525.
[282] "The Viceroy of Egypt," *Lloyd's Weekly Newspaper*, 4 July 1869, 6.
[283] "The Event of the Year," *Lloyd's Weekly Newspaper*, 2 January 1870, 6.
[284] "Opening of the Suez Canal," *Illustrated London News*, 27 November 1869, 526.
[285] Cf. René Verneaux, *L´Industrie des Transports Maritimes au XIXe Siècle et au Commencement du XXe Siècle* (Paris : Pedone, 1903), 1:329 .
[286] Cf. Hoskins, *British Routes to India*, 372.
[287] "The Opening of the Suez Canal," *Liverpool Mercury*, 19 November 1869, 6.
[288] Hoskins, *British Routes to India*, 372.

As the costs of construction in the end amounted to twice of what had originally been estimated,[290] the *Company* faced bankruptcy at the time of the inauguration. This actually did provide an opportunity for Great Britain to gain influence, but because of increasing profits the *Company* recuperated over the next years. In 1875, though, the Viceroy's financial troubles presented a new chance to get a grip on the canal: with the national debt having risen to £ 100 million and facing an annual interest of £ 5 million, selling his canal shares had become inevitable. Disraeli, presiding over the Conservative government since 1874, grasped the opportunity with both hands (despite the fact that Parliament was in recess and he meanwhile had to obtain funding from Baron de Rothschild). Finally, in November 1875, Britain purchased the Viceroy's 176,602 shares at a price of £ 4 million and thus became the largest single shareholder in the *Company*. Britain gained ten votes in the shareholders' general meetings and was granted the right to appoint three British Directors to the *Company*'s Board.[291] Despite the problems and conflicts that would arise in the decades to follow, "[t]he purchase of the Suez Canal shares was looked upon (…) as the last step in the long struggle to control or at least make safe the principal route to India, China, and Australia."[292]

2.2 Railways

Harold Perkin asserts that "[t]he invention of the railway (…) is Britain's greatest contribution to the progress of civilization," which is why he declares that "it was here that the modern world began."[293] Disregarding the overblown rhetoric, it is fairly obvious that, after centuries in which the speed of land transport or communication had not improved significantly, it advanced decisively with the advent of railways and steam locomotives.

[289] For a full account of the complications arising after the opening of the canal, see ibid., 453 – 480, Wilson, *The Suez Canal*, 59 – 88, and Kinross, *Between Two Seas*, 255 – 275.
[290] Cf. Wilson, *The Suez Canal*, 47.
[291] Cf. Hoskins, *British Routes to India*, 465-467; Kinross, *Between Two Seas*, 272. Kinross also points out that voting rights did not come along with the shares themselves, though: As the Viceroy had earlier signed off his voting rights along with the coupons, it was only after negotiations with the Company that an agreement was reached which granted these rights to Great Britain.
[292] Hoskins, *British Routes to India*, 473. There were, however, also more pessimistic points of view, fearing that British intervention in Egyptian affairs would create more problems than it solved. Cf. ibid.
[293] Harold Perkin, *The Age of the Railway* (London: Panther Books, 1970), 12.

Primitive schemes of railways had been used in Britain since the seventeenth century,[294] but profound improvements were only achieved with the introduction of the steam locomotive from the early nineteenth century onwards. In 1804, Richard Trevithick built the first successful steam railway locomotive. As the cast-iron rails used at the time kept breaking under such heavy burdens, however, no regular service was established.[295] The engines were further improved within the next two decades, but these early locomotives were still rather unreliable and could hardly be used for longer journeys. Finally, in 1829, during the Rainhill trials – a competition whose only purpose was to figure out which form of power would be the most suitable for the soon to be opened Liverpool and Manchester Railway – the steam locomotive *Rocket* "demonstrated (…) for the first time the superiority of the steam railway over all other known forms of land transport."[296] The Liverpool and Manchester Railway was one of the first trunk lines in Great Britain. It was opened in September 1830 in response to the business community's calls for better transport between the two prospering towns. The line was the first to combine all features of 'modern' railways (that is locomotive operation, double tracks, side and passing tracks, tunnels, viaducts, cuttings, embankments, signals, service according to timetables, an entire fleet of vehicles and first-, second-, and third-class compartments)[297] and reduced the journey time between Liverpool and Manchester to around two hours (previously four and a half hours by stagecoach).[298] Although it had originally been planned with regard to the faster transport of goods and commodities, it became very popular as a passenger service. In the decades following the inauguration of the Liverpool and Manchester Railway, the majority of British trunk lines were installed, such as the Grand Junction Railway between Birmingham and Warrington (opened 1837), the London and Birmingham Railway (1837), the Great Western Railway (1838) and the London and Southampton Railway (1840). The railway network grew accordingly from 1,600 miles in 1842 to a little over 6,000 miles in 1850, so that around the middle of the nineteenth century the backbone of British railways had been put in place.[299]

[294] Various systems (such as wooden wagon rails) had been employed in mines to facilitate the transport of coal both within the mines and towards the respective ports; around 1800, this early railway network in Britain's industrial areas amounted to around 250 miles; cf. Conrad, *Geschichte der Technik*,128.
[295]Cf. P. J. G. Ransom, "Rail," in *An Encyclopaedia of the History of Technology*, ed. Ian McNeil (London: Routledge, 1990), 559.
[296] Ibid., 562.
[297] Cf. Ralf R. Rossberg, *Geschichte der Eisenbahn* (Künzelsau: Sigloch Service Edition, 1977), 22; Perkin, *Age of the Railway*, 77.
[298] Cf. Ransom, "Rail," 562.
[299] Cf. ibid., 566f.

From Britain, railways soon spread over the European continent, yet the developments in the various countries followed different directions; the first line on the continent was opened in Belgium in 1835 and was followed by lines in Germany later that same year, France, Austria, Russia (all 1837), and Italy and the Netherlands (1839). The development of actual railway *networks*, however, was in some cases delayed, for instance in France, where debates whether they should be financed by government or private business slowed down their construction.[300] Nonetheless, with railways being opened in more and more countries over the next decades, the continental network grew steadily, from around 1,800 miles by the end of the year 1840 to around 65,000 miles in 1870.[301]

With the establishment of main lines in Britain, the growing railway network in Europe and first public steam railways in India in 1854,[302] the idea of a trunk line all the way from either the English Channel or the North Sea to India gained momentum in Britain. After the disappointing outcome of the steamship expedition in Mesopotamia in the 1830s, the progress of railways sparked new interest in the Euphrates route. The proponents of the various railway schemes that emerged over the years estimated that it would reduce the distance to be covered by more than 900 miles; accordingly, it would only take one week to travel from London to India, and fares would be reduced tremendously. Moreover, it was suggested that any such scheme could avert the danger of Russian expansion towards India and that the opening up of Mesopotamia by means of railways would offer new opportunities for businessmen.[303]

Whether by steamship or railway, though, British endeavours in opening up the Euphrates route seem to have been doomed: for various reasons, a Euphrates Valley Railway as intended by the British was never achieved. The first such endeavour of connecting the European and Indian lines by means of a railway through the Ottoman Empire, brought forward by the Managing Director of the *East India Railway Company* in 1855, was turned down by Lord Palmerston in light of the tense political situation prevalent in Europe at that time. A few years later, another proposal, presented in 1856 by the Chairman of the *Scinde, Punjab, and Delhi Railways* and the newly formed *Association for the Promotion of the Euphrates Valley*, met the same fate: in fact, the

[300] Cf. ibid., 574f.
[301] Cf. Rossberg, *Geschichte der Eisenbahn*, 89.
[302] The Indian railway network grew rapidly from approximately 850 miles in 1860 to around 4,750 miles in 1870. Cf. ibid., 113.
[303] Cf. Hoskins, *British Routes to India*, 327-333.

Ottoman government preferred the British proposal over one France had submitted at around the same time. The *Association*, however, was concerned over Ottoman state finances after the Crimean War and therefore approached the British government, hoping to achieve a guaranteed minimum rate of interest. British government's consent seemed beyond doubt, given the fact that both the Anglo-Persian War and the outbreak of the Mutiny in India in 1857 had demonstrated the need for faster channels of communication and transport between Britain and India. Nonetheless, Lord Palmerston in the end denied financial support – apparently in view of the relationships with France, through which British troops were despatched to India and whose goodwill was thus much needed – and declared that the existing routes and telegraph lines offered sufficiently rapid channels of transport and communication.[304] Despite the project being looked upon favourably by, amongst others, Queen Victoria and Lord Clarendon, the project was therefore abandoned in the end.

Nonetheless interest in a railway line to India did not cease. In 1862, a further attempt of the *Euphrates Valley Railway Company* failed due to lack of financial support on the part of government. A few years later, however, with France gaining strength in international affairs – owing to the opening of the Suez Canal, the acquirement of a foothold in Somaliland and the expansion in Indochina – the establishment of new routes not controlled by the French had become an urgent matter. In summer 1870, surveys were carried out, and from the following year onwards, a House of Commons Select Committee attended to the matter. In the early 1870s, the Committee proposed several different routes, all of which had to be investigated more closely. But this was not to be: with British representation in the *Suez Canal Company*'s board of control, reliable and undisturbed transport to India had been secured.

As a result, at a time when railways were prospering and trunk lines in Britain, continental Europe, and India had been put in place, a direct railway connection between Britain and the 'Jewel in the Crown' was not achieved. Nonetheless, railways came to play an important role in terms of improved transport and communication between Britain and India.

[304] Cf. ibid., 341f.

2.2.1 Alpine Railways and the Acceleration of Communication between Britain and India

In terms of overland mails to India, there were – broadly speaking – two different routes from Britain to Egypt in the late 1830s: the Admiralty service from Southampton to Alexandria, with stopovers in Gibraltar and Malta, on the one hand; and the overland transport through France, followed by shipment from Marseilles, on the other. The connection via Marseilles turned out to be to the best advantage and was to improve further when, in the early 1860s, the railways between Calais and Marseilles were completed. As transport by train was much faster than by steamship, the conclusion was drawn that, the closer to Alexandria the European port of transshipment was, the more one could reduce travel time.[305]

In the early 1860s, the Italian government therefore proposed Ancona, located on the Adriatic Sea, to replace Marseilles as the European port for Eastern mail communications. Indeed, Ancona was more than 400 miles closer to Alexandria than the French seaport, and it was therefore estimated that one could save around 22 hours on the journey between Britain and India. For various reasons, however, the plan was abandoned. In the following years, the Italian railway network developed further, and in 1865, the Meridionale – a line between Ancona and the Adriatic seaport of Brindisi – was completed.[306] To British observers, this was a most welcome development: because of Brindisi's location in southern Italy, it was estimated that transmission times for Eastern mail communication could be reduced by 36 hours. Moreover, once the Meridionale had been inaugurated, Calais and Brindisi were connected by around 870 miles of rail, but for one gap – the Mont Cenis, a massif in the southern Alps between France and Italy.

The Alpine pass Col du Mont Cenis had traditionally been the most traversed route between the two countries. A road across the pass was opened in the early nineteenth century and allowed for a stagecoach service, which represented an enormous improvement; with railway services being in place on either side of the pass in the 1850s,[307] however, the leg by coach with all its inherent drawbacks (passage would take

[305] Cf. ibid., 408; nonetheless, these routes were at the time being considered to serve as interim solutions only, until the railway described above was finally achieved; cf. ibid, 410f.
[306] Cf. Ransom, *Mont Cenis Fell Railway*, 14.
[307] On the Italian side, the line Turin-Susa was completed in 1854; the French line from Culoz to St. Jean de Maurienne in 1856. Cf. ibid, 14.

around 9 hours in summer; in winter, however, the same passage could take disproportionately longer, and at times progress was rendered altogether impossible by bad weather conditions) was a major obstacle to speedy communication between France and Italy.

The most obvious solution to this problem seemed to be a tunnel, first proposals for which date from the 1840s. Financed by the governments of France and Sardinia, constructions works on such a tunnel, connecting Fourneaux in Savoy with Bardonèccia in Piedmont over a distance of more than 7 miles, were commenced in 1857. Once completed, the Fréjus Tunnel, better known as the Mont Cenis Tunnel,[308] would exceed the longest railway tunnel of the time by more than 4 miles. However, due to the rather simple tools available at the time (basically, manual labour and gunpowder), work proceeded extremely slowly, and in the mid-1860s it was assumed that the tunnel would not be opened for another ten years.

These estimates, in turn, caused another project, which was just as challenging as the tunnel itself: the construction of a railway across the pass, "pending the completion of the Mont Cenis (Fréjus) tunnel."[309] The British railway engineer John Barraclough Fell proposed the project to the governments of France and newly formed Italy, and was granted a concession under the condition that, once the tunnel was completed, the railway across the pass had to be closed again.[310] The *Mont Cenis Railway Company* was launched in February 1866, the intention being that the railway should be inaugurated in May the following year. This undertaking – entirely under British auspices – was no less challenging than the construction of the tunnel itself. Indeed, the steep rise as well as weather conditions called for special technical refinements. The Mont Cenis railway was finally opened in June 1868, and "at the time, [it] was the last link in a route for the *Bombay Mail* from Calais to Brindisi."[311] [italics in original]

In the meantime, however, owing to the use of newly developed tools, such as pneumatic drill machines and dynamite, tunneling had progressed much faster than previously: In the beginning of 1870, more than 6 miles had been bored and breakthrough was finally achieved on Christmas Day the same year. The tunnel was opened for traffic in October 1871 and "became and remains a vital component of the

[308] Although, strictly speaking, it does not pass under the Mont Cenis. Cf. ibid, 14.
[309] O.S. Nock (ed.), *Encyclopedia of Railways* (London: Octopus Books, 1977), 313.
[310] Cf. ibid., 314.
[311] Ibid., 313.

European rail network."[312] Disregarding improvements on the railway lines from Calais to Marseilles, Brindisi was the major port of departure for Eastern mail from 1870 onwards.[313]

Already before the completion of the tunnel, the *Illustrated London News* places it in the wider context of British interest in the East and highlights its importance:

> But though each of the several great improvements begun or now partly realised – viz., the Alpine railways, both the summit and the tunnel lines; the harbour works at Brindisi; and the Isthmus Canal – may achieve success without the aid of the others, we shall not, perhaps, be mistaken in regarding them as portions of a vast system hereafter to be completed for the increased convenience, economy, and speed of our communications with Asia.[314]

The advantages the Mont Cenis Tunnel would offer seem beyond doubt, as

> with regard to the Alpine railways and the substitution of an Italian for a French port of departure and arrival for our Indian mails, there can only be one opinion in the minds of Englishmen, which must be the conviction that such a change is highly desirable for all the interests of the British Empire.[315]

Shortly after its opening, the tunnel is therefore considered to have

> already become the highway from England to India, to some extent for goods, but still more for passengers, who consider the route by the Mont Cenis Tunnel and Brindisi, not only the shortest but the pleasantest way to the Presidencies of Bombay, Madras and Calcutta.[316]

Similarly, the *Times* asserts that the crossing of the Alps "was done in as simple a way as one might get from the Charing-cross to the Temple station of the London Underground Railway,"[317] and that by "strik[ing] the Alps off the traveller's path,"[318] Italy had become a "long pier almost half across the Mediterranean on our way to the East."[319]

As has been shown, in the course of the nineteenth century, global transport and, by extension, communication had become much faster and more reliable. Concerning

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[312] Ransom, *Mont Cenis Fell Railway*, 62.
[313] Hoskins, *British Routes to India*, 411. Hoskins also points out, though, that the Mont Cenis route was after all not the only route from Britain to Brindisi; there was, for instance, an alternative line via Ostend, Brussels, Cologne, Stuttgart, Munich, across the Brenner Pass and Verona. Cf. ibid., 410.
[314] "The Mont Cenis and Brindisi Overland Route," *Illustrated London News*, 16 January 1869, 70.
[315] Ibid.
[316] *The Mont Cenis Tunnel, its Construction and Probable Consequences* (London: Charles J. Skeet, 1873), viii.
[317] "The Mont Cenis Tunnel," *The Times*, 19 September 1871, 8.
[318] "The Mont Cenis Tunnel," *The Times*, 20 September 1871, 4.
[319] "The Mont Cenis Tunnel," *The Times*, 2 September 1871, 7.

global communication, however, a new age altogether dawned with the invention of electric telegraphy.

2.3 Early Telecommunications – The Electric Telegraph

If we want to fully understand the impact the electric telegraph and the emerging network of landlines and submarine cables had on global communication, it is first of all necessary to examine telegraphy's prime asset: the dematerialization of information flows, by means of which the "quality of global communication was completely altered."[320] This is most easily understood when we think about such processes as quasi-mathematical equations. Prior to the construction of a global network of landlines and submarine cables, the exchange of news and information was inseparably linked to transportation and migration of people.[321] Understandably, the speed with which information travelled was restricted, for "information travelled as did any other traded commodity. It moved along with the cargo, and though not usually bulky, its speed was limited to that of the fastest mode of travel of the day."[322] Geographic distance was therefore a crucial variable in the equation, a factor that could not be eliminated: the further two places were apart in terms of geographic distance, the longer it would take to transmit information between these two places.[323]

Dematerialization, in this context, means "the translation of information into acoustic, optical or (...) electric impulses instead of using tangible (i.e. material) carriers."[324] Accordingly, when telegraphy came into being, the flow of communication and the exchange of information no longer hinged on messengers and transportation. As a

[320]Roland Wenzlhuemer, "The Dematerialization of Telecommunication. Communication Centres and Peripheries in Europe and the World, 1850 – 1920," *Journal of Global History* 2, no. 3 (2007):347. Wenzlhuemer himself has previously referred to the dematerialization of communication, but has now come to speak of the dematerialization of information flows; for clarification, see Wenzlhuemer, *Connecting the Nineteenth Century World*, 35f.

[321] Cf. Wade Rowland, *Spirit of the Web. The Age of Information from Telegraph to Internet* (Toronto: Key Porter Books, 1999), 37. Needless to say that there had been techniques of communication that did not involve transport, such as systems making use of smoke and acoustic signals or beacons. The capacity of these early systems, however, was limited since they could only transmit rather simple messages and were prone to manipulation by external factors, such as weather and poor visibility. Cf. Huurdeman, *Worldwide History of Telecommunications*, 29.

[322] Lew and Cater, *The Telegraph and Tramp Shipping*, 147.

[323] Cf. Wenzlhuemer, "Globalization, Communication, and the Concept of Space," 23f. However, there can be exceptions, as obstacles of various kinds, such as mountains, rivers, borders or language barriers, just to name a few, can easily mix up this formula; cf. ibid., 24.

[324] Wenzlhuemer, "Dematerialization of Telecommunication," 349. Wenzlhuemer also points out that even the fact that telegraph cables are tangible and therefore 'material' does not oppose this definition, for "the flow of information itself is of a non-material nature and works along a different set of rules – even if it travels along a material structure." Wenzlhuemer, *Connecting the Nineteenth-Century World*, 36.

consequence, the temporal delay of several days, weeks or months that had previously inevitably resulted from the transport of a material message between far apart places could be eliminated:[325] geographic distance became comparatively insignificant, if not even negligible, in the above-mentioned communication function.[326] Consequently, the arrival of electric telegraphy is considered to be a "watershed in the history of globalization, because it created a new, virtual space in which established distances and limitations of time were suspended."[327]

2.3.1 From Optical to Electric Telegraphs – First Steps towards Instantaneous Communication

The invention of the first functioning optical telegraph is generally attributed to the Frenchman Claude Chappe and is closely associated with the French Revolution.[328] The system, developed in the late eighteenth century, submitted signals by means of pivot arms. Two so-called indicators were attached to a regulator, which, in turn, was installed on a pole. The whole apparatus was placed on top of a relay station. Using wire ropes, operators could move these arms and could thus, availing themselves of a code system specifically designed for this purpose, transmit a message. The operator at the relay station next in line could decode the message and retransmit it accordingly, and so on, until the message had finally reached its destination.[329] Chappe's optical telegraph is widely considered to be the first system by means of which long-distance

[325] Cf. John B. Thompson, *The Media and Modernity. A Social Theory of the Media* (Cambridge: Polity Press, 1995), 32.
[326] Cf. Wenzlhuemer, "Globalization, Communication, and the Concept of Space in Global History," 24. However, he also points out that it was not annulated entirely: particularly in the early days of telegraphic communication, the technological standards of the time rendered relay stations at regular intervals necessary, where the messages would be retransmitted; obviously, the further two points were apart, the more such stations were needed, which increased, on the one hand, the amount of time taken to communicate the message, and, on the other, the risk of the message getting 'lost' or garbled. Cf. ibid.
[327] Wenzlhuemer, "Dematerialization of Telecommunication," 347. It is, however, important to keep in mind that it was not the speed alone that made telegraphy a qualitative improvement in terms of global communication. Rather, the fact that telegraphic communication outpaced other – material – means of transport made it a valuable tool for politics, the military, and commerce; cf. Roland Wenzlhuemer, "Editorial – Telecommunication and Globalization in the Nineteenth Century," in *Historical Social Research – Historische Sozialforschung. Global Communication: Telecommunication and Global Flows of Information in the Late 19th and Early 20th Century*, ed. Roland Wenzlhuemer (Cologne: Center for Historical Social Research, 2010), 10-13.
[328] Cf. Wobring, *Globalisierung der Telekommunikation*, 29f. Prior to Chappe's invention, a number of scientists had come up with other, to some extent adventurous optical communication systems; Chappe's system, however, was the first to be used on a grand scale; cf. Huurdeman, *Worldwide History of Telecommunications*, 15f.
[329] Cf. Huurdeman, *Worldwide History of Telecommunications*, 20f.

communication was detached from transportation. The systems had its limitations, though: Similar to the other early means of dematerialized communication, such as smoke signals, the use of optical telegraphs depended on both daylight and good weather conditions. Moreover, due to their visibility, relay stations were easy to detect and were therefore prone to attacks by anyone wishing to hamper the communication process.

The French National Convention nonetheless approved Chappe's system in 1793 and the Paris-Lille telegraph line was inaugurated in the following year. In the decades to follow, further lines were established and the French network of optical telegraphs – covering around 3,000 miles with 534 relay stations in 1850 – was way ahead of that of its European competitors, who either could not afford such elaborated systems or, with regards to state security, simply did not consider it necessary.[330]

Britain, however, nonetheless benefitted from these early telegraphs: On the initiative of the Egyptian government, optical telegraphs had been installed between Alexandria and Suez. The system went operational in 1823 (and was extended all the way to Suez in 1839) and was used to announce the arrival of steamships from India. In so doing, it allowed for a more efficient coordination of the different legs of the journey between Great Britain and India and consequently helped reducing transmission times.[331] Similarly, in the 1820s, a telegraphic communication system between Liverpool and the offshore islands Anglesey and Holy Island had been established, its objective being to guarantee the smooth processing of business transactions in Liverpool. What is more, it was used to immediately forward commercial or political news incoming ships provided.[332] The usefulness of telegraphic communication for different spheres of activity was thus well understood by contemporaries, and "[d]espite its shortcomings, the semaphore whetted appetites."[333] The invention of the electric telegraph was thus most welcome.

Already during the first half of the nineteenth century, a variety of systems of electric telegraphy had been developed, yet none of them had been particularly successful.[334] The first line in use was finally constructed by the Englishmen Charles Wheatstone and

[330] Cf. Headrick, *Invisible Weapon*, 11.
[331] Cf. Wobring, *Globalisierung der Telekommunikation*, 81-90.
[332] Cf. ibid., 66-69.
[333] Headrick, *Invisible Weapon*, 11.
[334] Samuel Thomas Soemmering (1809), Francis Ronalds (1816), Paul Schilling von Canstatt (1832), Carl Friedrich Gauss and Wilhelm Eduard Weber (1833), Karl August Steinheil (1835). Cf. Wenzlhuemer, "Dematerialization of Telecommunication," 352.

William Fothergill Cooke. Having convinced the directors of the *Great Western Railway* of the functionality of their device, they were commissioned to establish a telegraphic link between Paddington Station and West Drayton, covering a distance of around 13 miles. The line was inaugurated in July 1839 and turned out to be the beginning of a symbiosis between railway and telegraph companies: communicating, via telegraph the railroad companies could use their single-track systems in both directions without risking accidents. The telegraph companies, on the other hand, did not have to concern themselves with questions of right of way.[335] Accordingly, other British railway companies soon followed suit, so that in 1850 more than a quarter of the approximately 7,500 miles of the British railway network were accompanied by telegraph lines.[336]

Until today, however, electric telegraphy is (at least in popular culture) primarily associated with the name Morse. This is mostly due to the fact that the system developed by Samuel Finley Breese Morse, in combination with the code invented by Alfred Vail, proved superior to any other scheme and eventually became the prevalent system.[337] Further, Morse was responsible for the diffusion of the electric telegraph in the United States; the first experimental line between Washington and Baltimore was installed in 1843 and was officially inaugurated in May 1844. A year later, the first public telegraph office was opened in Washington D.C., and by 1850, twenty telegraph companies were in business.[338]

From the early days of electric telegraphy, first experiments concerning underwater telegraphy had been conducted. Investigations were carried out in Calcutta as early as 1838, and both the 'founders' of electrical telegraphy became involved, too: Wheatstone investigated the feasibility of submarine telegraphy in Wales in 1840. Morse, on the other hand, experimented in New York in 1843.[339] Despite this keen interest in advancing the potential applications of electric telegraphy, though, the technological possibilities were restricted: little was known about the depths of the oceans, and the physical requirements for transmitting underwater messages were still unexplored. Problems arising were mainly related to insulation (due to its salt content, sea water

[335] Cf. Hugill, *Global Communications*, 27.
[336] Cf. Huurdeman, *Worldwide History of Telecommunications*, 70.
[337] Cf. ibid., 87.
[338] Cf. ibid., 61-65.
[339] Cf. Standage, *The Victorian Internet*, 67f.

itself acted as a conductor) and proper protection of the cables against external factors.[340]

The solution to the problem of insulation was found in 1843 with the 'discovery' of Gutta-Percha, latex of the South Asian Palaquium tree. John and Jacob Brett made a first serious attempt to establish a submarine telegraphic link between Dover and Calais in 1850, which, however, was not particularly successful: data transmission was defective and the cable broke soon after installation.[341] When in 1851 an improved cable was laid, soon to be followed by a cable connecting England and Ireland in 1853, submarine telegraphy had been brought into existence.

2.3.2 Girdling the Globe – the Establishment of a Worldwide System of Electric Telegraphy

In the following years, the Crimean War had an enormous effect on the advancement of submarine telegraphy and is considered to have consolidated the link between military communication, politicians, journalists and the public.[342] Unlike before, military command could be exercised from afar, and political leaders made ample use of this opportunity, sending "bewildering telegrams"[343] to their military officers in the field. This represented a fundamental change in military strategy and resulted in a tide of projects aiming for the establishment of a cable network in the Mediterranean area (which should finally reach all the way to India). The first British and French cable-laying ventures were closely related to their imperial policies.[344]

To the British, direct telegraphic communication with India was a chance to extend their influence and strengthen their position of power. Particularly in the years of the uprising, when it would take a letter from Calcutta five to six weeks before it arrived in England,[345] the need for improved communications with the Eastern possessions became obvious. As has been mentioned earlier, more than a decade later, the events of 1857 and 1858 were still drawn upon in order to point out the significance of well-functioning telegraph connections between Britain and India:

[340] Cf. Hugill, *Global Communications*, 28.
[341] Cf. Standage, *The Victorian Internet*, 68-70.
[342] Cf. Winseck and Pike, *Communication and Empire*, 26.
[343] Nickles, *Under the Wire*, 33.
[344] Cf. Headrick, *Tools of Empire*, 159.
[345] Cf. Headrick, *Invisible Weapon*, 19.

> If, in 1857, Lord CANNING [*sic*] had been able to telegraph to England for more troops, it is generally agreed that some of the worst horrors of the Mutiny might have been prevented. Even if no such emergency should ever occur again, there are circumstances occurring almost every day which render quick and certain communication between England and India almost indispensable. It is impossible to calculate how much we might have saved by it, for instance, in this Abyssinian expedition. Many conflicting orders would have been rendered unnecessary, the authorities East and West would have seen their way clear before them, mistakes which have been committed might have been avoided.[346]

In terms of the establishment of cable connections to the subcontinent, though, the years between 1856 and 1860 can be referred to as "a time of failures:"[347] the cables between Corsica, Sardinia, Malta and Corfu, laid in the aftermath of the Crimean War, contributed decisively to the reduction of communication times between London and Alexandria, and, by extension, also between Britain and India.[348] The government-subsidized Red Sea Cable, however, laid in 1859 and 1860 by the *Red Sea and India Telegraph Company*, turned out to be counterproductive: due to the afore-mentioned lack of knowledge and experience concerning submarine telegraphy, this attempt remained unsuccessful and, owing to the financial burden it involved, the British government would refrain from getting involved in future projects too easily. It was only in 1865 that telegraphic connections between Great Britain and India were established, and even then not by submarine cable, but by means of various landlines: one via Southern Europe, via Constantinople, Bagdad, Fao and Karachi to Delhi and Calcutta; and an alternative route through Russia, via St. Petersburg, Tbilisi, Dzhulfa, Tehran, Bushir and Karachi.[349] Still, these did not really solve the problem of communicating 'instantly' with India: the lines were unreliable and messages had to be retransmitted several times, which meant they would often arrive with plenty of mistakes, if not entirely incomprehensible. It was in particular the Ottoman cable network that seemed prone to both technical and non-technical disturbances.[350] Furthermore, the British government had to confide messages with more or less sensitive content to a variety of people from different states, which did not only cause major delays (as local messages of the respective state were always given preference), but also rumours of espionage.[351] All these problems were also discussed in contemporary newspapers:

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[346] "The Pressing Necessity of an Efficient Telegraphic Service," *The Times*, 2 March 1868, 8.
[347] Headrick, *Invisible Weapon*, 19.
[348] Cf. Hoskins, *British Routes to India*, 374.
[349] Cf. Huurdeman, *Worldwide History of Telecommunications*, 125.
[350] Cf. Hoskins, *British Routes to India*, 387.
[351] Cf. Headrick, *Invisible Weapon*, 21.

> We depend largely upon the friendly offices of Russian and other Powers, and, without reference to that dread of a Russian advance upon India which a number of our countrymen entertain, it is manifestly undesirable that we should not be in a position to hold quick intercourse with our Indian Empire except by the tolerance and concurrence of a foreign Government. If we were indebted to the French Government for telegraphic communication with the United States, every one would feel that it was an arrangement which might not only produce great inconvenience, but might also be turned very much against us. Russia and other Powers stand to us in that position with regard to India.[352]

Eventually, a line through Germany and Russia to Tehran, constructed in 1870 by the newly founded *Indo-European Telegraph Company* and operated under a single, unified management, solved the problems mentioned above. When it was brought into service in November 1870, it reduced transmission time substantially (from 9 days 10 hours 39 minutes to 1 day 13 hours 10 minutes in 1870 and even further to 3 hours and 9 minutes by 1873).[353]

At around the same time, John Pender, who had been involved in the *Atlantic Telegraphy Company* since 1864, had become interested in constructing a reliable submarine line from Britain to India. In the following years, he launched several telegraph companies,[354] which he finally in 1872 merged to the *Eastern Telegraph Company*. He gradually linked Britain with India, by means of a submarine cable via Gibraltar, Malta, and Egypt. The submarine cable was entirely under British control, and even the short landline between Alexandria and Suez was run by British operators, so that "[i]n 1870, at last, Britain and India were linked by an efficient telegraph line that regularly conveyed messages in about five hours."[355]

Concerning telegraphic communication with North America, the situation had evolved differently with private entrepreneurs, rather than governments, pushing forward the laying of the more profitable cables across the Atlantic.[356] Already in 1845, John Brett had sought for state subsidies, but had not been granted any. The American Cyrus Fields had also become interested in the construction of a transatlantic connection, and in 1856, Fields, Brett and Charles Bright jointly set up the *Atlantic Telegraph Company.* In the years to follow, several attempts were made to link the continents by means of submarine cables, but none of them turned out successful: while the first ventures in

[352] "The Pressing Necessity of an Efficient Telegraphic Service," *The Times*, 2 March 1868, 8.
[353] Cf. Headrick, *Invisible Weapon*, 22.
[354] Falmouth, Gibraltar and Malta Telegraph Company (1869); Anglo-Mediterranean Telegraph Company (1868), Marseilles, Algiers and Malta Telegraph Company (1870). Pender even founded more companies to extend the cables beyond India. Cf. Huuurdeman, *Worldwide History of Telecommunications*, 136.
[355] Headrick, *Tools of Empire*, 160.
[356] Cf. Headrick, *Invisible Weapon*, 17.

1857 failed altogether, a second attempt in 1858 was at least temporarily successful, with a cable transmitting messages for several weeks in August and September of that year, before the connection ceased. After yet another unsuccessful attempt in 1865 (now employing the *Great Eastern* as a cable-laying ship), a breakthrough was finally achieved in July 1866, when the first permanently operating cable was laid. Soon afterwards, the 1865 cable was lifted and spliced, so that in autumn 1866, two submarine cables spanned the Atlantic Ocean.

In the years to follow, numerous other submarine cables were established, such as cables connecting India with Saigon, Hong Kong and Shanghai (from where it went further to Java and Port Darwin) (1871), a cable linking Europe with Brazil and Argentine (1873), an extension of the Australian cable to New Zealand (1876) and two cables linking Europe with West and South Africa (1885). When in 1902 a line from British Columbia to New Zealand was completed, finally "all parts of the British Empire could (...) communicate by a cable network upon which the sun never set."[357]

From the onset of electric telegraphy and the emergence of a global cable network until after the end of the Second World War, Great Britain held an outstanding position as regards global communications. In 1892, British telegraph companies owned 257 cables comprising a total of more than 96,000 miles of length (that is 63.1 percent of privately owned cables). Compared to that, the 77 cables of around 40,000 miles length owned by non-British companies seem almost negligible.[358] Looking at the aggregate of both privately owned and government cables, we get a similar picture, with Britain owning 66.3 percent of the total of cables – Britain had managed to "establish [...] itself securely as the information hegemon by the late 1800s at the geographic center of a global network of submarine cables."[359]

2.4 The Great Exhibition of 1851 – Technological Developments on Display

The *Liverpool Mercury* describes the *Great Exhibition of the Works of Industry of all Nations*, as it was officially called, as an event which was "testing the progress of civilization,"[360] and the *Observer* even went as far as describing it as "[t]he great event

[357] Headrick, *Tools of Empire*, 163.
[358] Cf. Headrick, *Invisible Weapon*, 38f.
[359] Hugill, *Global Communications*, 28. For the reasons for Britain's dominance in global communications, see Headrick, *Invisible Weapon*, 28 -31.
[360] "Close of the Great Exhibition," *Liverpool Mercury*, 14 October 1851, 4.

of the year – not to say of this age."[361] As Louise Pubrick points out, conventional historical accounts of the Exhibition similarly tend to describe it as "a revolution, a coronation, the last year of a war or the first of a parliament."[362] She subsequently declares that "it was none of these things,"[363] and that its historical significance does not reside in the amount of objects on display or the number of visitors it attracted.[364] Nonetheless, these and related aspects need to be considered briefly if we want to examine the ways in which the Exhibition was represented in contemporary media.

When Queen Victoria officially inaugurated the Exhibition on 1 May, the Crystal Palace accommodated 17,000 exhibitors from 94 countries.[365] More than 100,000 exhibits, which had originally been grouped in four different categories (Raw Materials, Machinery, Manufacture, Sculpture), were on display and covered a wide spectrum of products, ranging from heavy machinery, such as railway engines, to the fine arts, jewelry, soaps and toys. Half of the exhibition space at the Crystal Palace had been reserved for the products Great Britain and its colonies wished to display. Britain, intent on illustrating its industrial products, exhibited, amongst other things, railway coaches, machine tools, steamship equipment and agricultural devices, just to name a few. In order to display machines in operation and to give visitors a chance to appreciate British inventiveness and gain an understanding of Britain's significance as the 'workshop of the world', a so-called Machinery Court had been arranged for.[366] Moreover, the host country was also eager to portray itself as a global player and colonial power: what to most nineteenth-century Britons were 'exotic' products imported from all over the world, such as spices, coffee, tea and tropical wood, were given particular attention. Britain's Eastern colonies, especially India, took center stage and were of extraordinary

[361] "The End of the Exhibition," *The Observer*, 13 October 1851, 5.
[362] Louise Purbrick, ed., introduction to *The Great Exhibition of 1851. New Interdisciplinary Essays* (Manchester: Manchester University Press, 2001), 1.
[363] Ibid. In recent years, the Great Exhibition has been looked at from new perspectives and reinterpreted repeatedly; questions which have been dealt with include, inter alia, to what extent the Great Exhibition can be considered a cultural product of the middle class and the contrast between it being presented as a festival of peace and harmony, on the one hand, and the nationalistic and xenophobic tendencies it brought to light, on the other; cf. Jeffrey A. Auerbach, *The Great Exhibition of 1851: A Nation on Display* (New Haven: Yale University Press, 1999); John R. Davis, *The Great Exhibition* (Stroud: Sutton, 1999); Paul Young, *Globalization and the Great Exhibition. The Victorian New World Order* (Basingstoke: Palgrave Macmillan, 2009).
[364] Cf. Purbrick, introduction to *The Great Exhibition of 1851*, 6.
[365] Kretschmer speaks of more than 17,000 exhibitors, whereas Hobhouse contends there were only around 14,000; cf. Winfried Kretschmer, *Geschichte der Weltausstellungen* (Frankfurt: Campus Verlag, 1999), 32; Hermione Hobhouse, *The Crystal Palace and the Great Exhibition. Art, Science and Productive Industry. A History of the Royal Commission for the Exhibition of 1851* (London: Athlone Press, 2002), 66.
[366] Cf. Kretschmer, *Geschichte der Weltausstellungen*, 35f.

interest to many visitors. As the *Times* remarks a few weeks after the opening, "[s]o far India and the foreign exhibitors have carried off the lion's share of public admiration. The tide of spectators sets eastward with a far stronger current than towards the west."[367] Visitors were torn between fascination, on the one hand, as the exhibits appeared to bear witness to what was perceived of as Oriental magic; and dismay, on the other, as they also indicated what to European observers was sheer barbarism.[368] (see chapter 7) Following Great Britain as the second-largest exhibitor was France, which had held several *national* industrial exhibitions in the previous half-century. In contrast to Britain's exhibits, the French products on display bore witness to the achievements of French small industry and featured primarily high-class consumer goods such as vases, clocks and crockery.[369]

As a "fair-ground of innovation,"[370] the Great Exhibition was all the more important as it "cut across traditional class boundaries and distinctions"[371] and therefore became a "forum for discussions of British national identity in the broadest sense."[372] Indeed, the Exhibition's financial success has been attributed to the high number of working-class visitors, who, attracted by the low entrance fees on what was referred to as shilling days, and the reduced railway tickets for everyone travelling to the Exhibition, flocked to the Crystal Palace. During the second week of May, for instance (that is before the introduction of shilling days), 128,000 people had visited the Exhibition. Once the shilling days had been introduced, there were up to 300,000 people a week coming to see the exhibition in the months of June and July. In the weeks immediately before the closing of the Exhibition, around half a million people visited the Crystal Palace. When it finally closed its doors on 11 October, more than 6 million visitors had come to see the first international industrial exhibition.[373]

[367] "The Great Exhibition," *The Times*, 24 May 1851, 8.
[368] Cf. Young, *Globalization and the Great Exhibition*, 120 – 132, and Kretschmer, *Geschichte der Weltausstellungen*, 41f. See also Chapter 7.
[369] Cf. Kretschmer, *Geschichte der Weltausstellungen*, 37. See also Chapter 7.
[370] Cf. ibid., 36. My translation. German original: "Jahrmarkt der Neuerungen."
[371] Auerbach, *Nation on Display*, 2.
[372] Ibid., 3.
[373] Cf. Hobhouse, *The Crystal Palace and the Great Exhibition*, 69.

2.5 Chapter Summary

The nineteenth century witnessed the formation of the first global transport and communication infrastructure. The time it took to transport goods or people and to communicate between remote places was thus reduced drastically, and specifically global communication reached an entirely new quality with electric telegraphy and the dematerialization of information flows it allowed for. For Great Britain, this was of paramount importance in terms of both its imperial and commercial relations with India and the United States, respectively.

As has been shown, though, this was by no means a transport and communication *revolution*. Instead, new technologies had been developed gradually over decades, if not centuries. Similarly, the establishment of the corresponding infrastructure also required decades and was characterized by both multifarious technological challenges and unsuccessful attempts, on the one hand, and the multi-layered (and often contrary) political and commercial interests of the various parties involved. These aspects have been explained in more detail than may be necessary to trace the development of the infrastructure as such. Rather, it was necessary to point out the various difficulties and conflict situations, as these were taken up in contemporary reporting and informed the representations of the technologies involved.

3. Technology and Society – Reflections on a Complex Relationship

For historians attending to technology-related questions, it is indispensable to reflect on the conflicting approaches towards technology and its wider role within society. Questions concerning agency – that is, if agency is exclusive to humankind, whether it can be inherent in technology and who (or what) is eventually to be held responsible for the outcome of actions 'performed' jointly by humans and objects – take centre stage in this connection. Given the research questions of this dissertation, an outline of the key characteristics of the various approaches is all the more necessary and provides the groundwork for the following chapters.

This chapter therefore provides a short overview of the different approaches towards the relation between technology and society. To start with, I will briefly outline the theories of technological determinism and the social determination of technology. Both these concepts, however, have long been refuted as approaches by means of which the relation between humans and technology could be described and analyzed sufficiently. Instead, sociological perspectives focusing on the way individual users actually apply a specific technology appear more fruitful and have gained centre stage in recent times. In this context, I will also look at relevant aspects of Actor-Network-Theory, which aims for the overcoming of the traditional subject-object dichotomy and emphasizes processes of hybridization.

Subsequently, I am going to look at what are widely held to be typical nineteenth-century approaches towards the relation between technology and society and briefly introduce the philosophical and cultural movements into which they were embedded.

3.1 Technological Determinism vs. Social Determination of Technology

In the introduction to their anthology *Does Technology Drive History?*, Merritt Roe Smith and Leo Marx refer to what they call "mini-fables:"[374] these are simplified before-and-after comparisons, in which specific technologies or machines are presented as if they inevitably bring about certain social or cultural changes. These mini-fables include, *inter alia*, the account according to which the automobile was responsible for the emergence of suburban residential areas, and the notion that the contraceptive pill,

[374] Merritt Roe Smith and Leo Marx (eds.), introduction to *Does Technology Drive History? The Dilemma of Technological Determinism* (Cambridge, MA: MIT Press, 1995), x.

introduced in the early 1960s, resulted in the sexual revolution.[375] These examples help us identify one of the key characteristics of technological determinist viewpoints, that is the belief that "the advance of technology leads to a situation of inescapable necessity."[376] Similarly, Jacques Ellul has earlier pointed out that "[e]xternal necessities no longer determine technique. Technique's own necessities are determinative. Technique has become a reality in itself, self-sufficient, with its special laws and its own determinations."[377] In plain words, this means that technology is an isolated entity (rather than part of society) driven by internal dynamics. Technological change is therefore thought to happen for no particular reason and without any external trigger. Accordingly, developments in the field of technology occur autonomously and can neither be subjugated by human willpower nor reversed. Eventually, this means that what we are today is what the steam engine, the automobile, the nuclear bomb, or any other technology, for that matter, have made us.[378]

Until today, the idea that a specific technology, once 'unleashed', inevitably leads to a certain result or a particular kind of society is a widely held popular belief and finds expression in terms such as 'age of electricity' or 'information age'. The popularity of such one-sided explanations is in all likelihood related to the material qualities of most technological devices, their "thingness" (in contrast to the intangibility of political or socio-economic factors, on which one could alternatively draw to explain changing patterns).[379] Two examples of technological determinist analysis espoused by twentieth-century historians are, firstly, that the emergence of medieval social systems can be ascribed to the invention of stirrups and, secondly, that the sixteenth-century Protestant Reformation would not have been possible without the invention of the printing press.[380]

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[375] Cf. ibid., xi.
[376] Ibid., xii.
[377] Jacques Ellul, *The Technological Society* (New York: Vintage Books, 1964), 133f.
[378] Cf. Raymond Williams, *Television. Technology and Cultural Form* (London: Fontana, 1974), 13. Most noteworthy, in this context, is surely Karl Marx' statement that "[t]he handmill gives you society with the feudal lord; the steam-mill, society with the industrial capitalist." Karl Marx, *The Poverty of Philosophy* (Moscow: Foreign Languages Publishing House, c. 1962 [c.1847]), 105. For a discussion of whether Marx is to be viewed as an adherent of technological determinism, see William H. Shaw, "'The Handmill Gives you the Feudal Lord': Marx's Technological Determinism," *History and Theory* 18, no. 2 (1979).
[379] Smith and Marx, introduction to *Does Technology Drive History?*, xi.
[380] Cf. Lynn White, *Medieval Technology and Social Change* (Oxford: Clarendon Press, 1963); Elizabeth Eisenstein, *The Printing Press as an Agent of Change. Communications and Cultural Transformations in early-modern Europe* (Cambridge: Cambridge University Press, 1979). With regard to White's publication, however, Weyer points out that everyone truly acquainted with his work could hardly

Unsurprisingly, technological determinist approaches did not spare media of communication, information and transportation either, and a multitude of developments and phenomena related to them in one way or the other have been explained in a monocausal manner.[381] Both Marshall McLuhan's *The Gutenberg Galaxy* and *Understanding Media*, in which he elaborates how different technologies shaped society, are worthy of mention in this respect. In *The Gutenberg Galaxy*, McLuhan argues that the emergence of nationalist movements and nation states in Europe is to be ascribed to the printing press.[382] In *Understanding Media*, he considers the ways in which successive means of transport impacted on urban development:

> With the coming of the horse-drawn bus and streetcar, American towns developed housing that was no longer within sight of shop or factory. The railroad next took over the development of the suburbs, with housing kept within walking distance of the railroad stop. Shops and hotels around the railroad gave some concentration and form to the suburb. The automobile, followed by the airplane, dissolved this grouping and ended the pedestrian, or human, scale of the suburb.[383]

It is, however, precisely technological determinism's simplistic onesidedness – in other words, the disregard of any social or cultural factors – for which it cannot serve as an appropriate approach for sociologists or historians enquiring the relationship between technology and society: as Williams has pointed out, "if the medium (…) is the cause, all other causes, all that men ordinarily see as history, are at once reduced to effects."[384]

From the 1980s onwards, the concept of the social determination of technology gained momentum and "[served] as a needed corrective."[385] In their seminal work *The Social Shaping of Technology* (first published in 1985), MacKenzie and Wajcman dismiss technological determinism as "at best an oversimplification."[386] Their major point of criticism is that, rather than taking into account the social and cultural surroundings in which new technologies emerged, technological determinist accounts present them as if

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consider him an adherent of technological determinism; cf. Johannes Weyer, *Techniksoziologie. Genese, Gestaltung und Steuerung sozio-technischer Systeme* (Weinheim: Juventa Verlag, 2008), 32f.

[381] Along with EIizabeth Eisenstein, Murphie and Potts mention the works of Eric Havelock, Walter J. Ong, Jack Goody and Pierre Levy, for "in tracing the far-reaching cultural effects made possible by certain technologies (…), their focus is on the way in which a new technology creates a new potential and possibility for human thought, expression or activity." Andrew Murphie and John Potts, *Culture and Technology* (Basingstoke: Palgrave, 2003), 12f.

[382] Marshall McLuhan, *The Gutenberg Galaxy, The Making of Typographic Man* (London: Routledge and Paul, 1962).

[383] Marshall McLuhan, *Understanding Media. The Extensions of Man* (London: Routledge and Kegan Paul, 1968), 180.

[384] Williams, *Television*, 128.

[385] Langdon Winner, "Do Artifacts have Politics?" *Daedalus* 109, no. 1 (1980):122.

[386] Donald MacKenzie and Judy Wajcman (eds.), *The Social Shaping of Technology* (Buckingham: Open University Press, 1999), 4.

they materialized in a vacuum.[387] They argue that such popular narratives – or myths, as Lelia Green calls them[388] – are no adequate descriptions of the emergence and diffusion of new technologies. As Green observes in a mocking tone, "Newton's flash of insight into the principle of gravity had more to do with the time and culture in which he was working than with him being bopped by a piece of fruit."[389] Accordingly, within the framework of the social determination of technology, technologies themselves are not considered to be endowed with agency; neither are they thought of as isolated entities. Instead, they are conceptualized as objects susceptible to social and cultural influences, and it is precisely these social and cultural influences that take centre stage.

An oft-quoted example for the social determination of technology is Langdon Winner's account of the so-called Moses Bridges in New York. The parkways leading to Jones Beach State Park, a recreational area located on Long Island, are bridged by numerous overpasses. Both the park and the overpasses were designed by Robert Moses (1888 – 1981). Winner argues that Moses had the overpasses built in a way that cars could pass underneath, but busses could not. Accordingly, the poorer (and mostly black) part of the population, dependent on public transport, was kept away from Jones Beach, so that the white middle- and upper-class visitors could indulge in the recreational area all by themselves. Winner suggests the bridges were from the onset constructed with this aim in mind and therefore bear witness to the racial prejudice of their time. In conclusion, Winner declares that "[a]rtifacts can have political qualities."[390]

Brian Winston, in turn, addresses questions related to the emergence of communication and information media ranging from the telegraph to the internet. He emphasizes the "primacy of the social sphere"[391] in terms of the 'invention' and development of new technologies and sets out to examine "the operation of the accelerators and brakes, or social necessities and constraints, rather than […] the performance of technology *in vacuo*."[392] One example he provides is the telegraphic device developed by Francis Ronalds. In 1816, Ronalds approached the British Admiralty with a fully operational electric telegraph. The device was turned down, though: Admiralty officials thought that semaphores and the current system of flag signals served them sufficiently well and

[387] Cf. ibid., 5-11.
[388] Cf. Lelia Green, *Communication, Technology and Society* (London: Sage, 2002), 2.
[389] Ibid.
[390] Winner, "Do Artifacts have Politics?," 134. Winner's claim that the black population was kept away from the State Park was refuted, though, and Winner faced severe criticism; cf. Bernward Joerges, "Do Politics have Artefacts?," *Social Studies of Science* 29, no. 3 (1999):411-431.
[391] Brian Winston, *Media Technology and Society. A History: From the Telegraph to the Internet* (London: Routledge, 1998), 2.
[392] Ibid., 15.

therefore could not think of any potential use of Ronalds' device. What Winston calls a supervening social necessity for electric telegraphy only emerged with the onset of the railway age and the need for instantaneous communication in order to guarantee efficient and safe usage of the single-track rails.[393]

From a twenty-first century perspective, the notion of the social determination of technology is probably most easily understood looking at the controversies arising over endeavours in genetic engineering. For various reasons – ethical and ecological concerns, for instance – such research has been subject of intense public and political debate and has therefore been legally narrowed down and restricted. Different countries, however, have come to different conclusions, and what is allowed in one state may be forbidden in the other. As a general rule, the work a scientist can perform in a laboratory or any other research facility is thus not determined by the scientific means and technological resources themselves, but by legislation, which is the result of lengthy social and political negotiation processes (which, in turn, are dominated by the social elite).[394] In a similar manner, what users can *de facto* access or view on the internet is subject to many factors which usually vary from country to country (just think of countries such as China or Syria which have temporarily or permanently banned Facebook, Twitter and similar social networking sites).

As antithetic as these approaches of technological determinism, on the one hand, and the social determination of technology, on the other, may be, they do after all have one thing in common: They both largely disregard the actual user of the 'product'. In case of the former, this is due to the fact that agency is considered inherent to technology and the user is accordingly deemed irrelevant; in case of the latter, because the focus is more on the development of technologies and the social factors involved.

3.2 Actors, Artefacts and Actants: Sociological Technology Studies

To close this gap and to do justice to David Edgerton's request to study technologies in use,[395] it is worthwhile to have a look at sociological approaches towards technology which focus on how specific technologies are actually applied. A fundamental assumption in the field of sociological technology studies is the idea that technology is a

[393] Cf. ibid., 22f.
[394] Cf. Green, *Communication, Technology and Society*, 9f.
[395] Cf. David Edgerton, "From Innovation to Use," 112.

social process. An artefact by itself (according to Rammert, this is a 'narrow' understanding of technology) is of no interest to sociologists. This changes, though, as soon as the artefact is used and thus becomes part of social actions (so-called broad understanding of technology).[396] Sociological technology studies accordingly focus on what Degele refers to as "daily practice of doing things,"[397] that is, on the ways and extent to which technology is used and how social (inter)actions are changed by it. Furthermore, the aspect of knowledge – that is, acquaintance with a certain technology and the ways in which to use it, rather than scientific knowledge of the underlying structures and principles – is of paramount significance in this context, as it impacts on the way users handle a specific technology (and thus on the results they may receive).
In order to clarify what is at the centre of attention of sociological technology studies, Weyer gives the example of a hammer, which – by itself – is nothing more than a piece of iron combined with a piece of wood.[398] To sociologists, the hammer hardly matters as long as it is not made use of. However, as soon as someone does use the hammer, it becomes part of social action and is thus of paramount interest. At this, Weyer specifically refers to the prominent role of previous experience and familiarity with the object: as the process of knocking a nail into a wall is "carried out jointly by actor and artefact,"[399] the individual capabilities of the person using the hammer play a decisive role. A child, in all likelihood, will use the hammer far less efficiently than a professional craftsman (or any moderately gifted adult, for that matter). Similarly important, however, is the fact that handling a hammer can be learnt, either through experiments or by means of instruction by other users: most craftsmen were probably not able to use a hammer in a competent way when they were children themselves. They have gained this expertise over the years or when someone, at some point in time, showed them how to use the tool correctly.[400]

Bruno Latour also deals with the interaction of human actors and the artefacts at their disposal, albeit he, in the framework of Actor-Network-Theory, takes it to another level. In principle, Latour emphasizes that artefacts also have agency. In so doing, he repudiates the traditional sociological understanding of agency, according to which it is

[396] Cf. Werner Rammert, *Technik aus soziologischer Perspektive: Forschungsstand, Theorieansätze, Fallbeispiele. Ein Überblick* (Opladen: Westdeutscher Verlag, 1993), 10f.
[397] Nina Degele, *Einführung in die Techniksoziologie* (Munich: Wilhelm Fink Verlag, 2002), 20. My translation. German original: "alltägliche 'Praxis des Machens'."
[398] Cf. Weyer, *Techniksoziologie*, 34.
[399] Ibid., *Techniksoziologie*, 35. My translation. German original: "der von einem Akteur und einem Artefakt (…) gemeinsam vollzogen wird."
[400] Cf. ibid.

intrinsically linked to intentions (and therefore must be one of humankind's prerogatives). For Latour, the traditional juxtaposition of subject and object is obsolete; instead, he highlights the merging, or hybridization, as he calls it, of humans, animals and artefacts (to all of which he refers as actants).[401]

A good example of this hybridization of human and artefact is the – admittedly oft-quoted – example of the gun and the question of who fires the bullet. As mentioned before, Weyer points out that the nail is being knocked into the wall jointly by actor *and* artefact. Latour, on the contrary, no longer distinguishes the two as separate entities: rather, a person being angry and longing to take revenge, yet unable to do so by means of his hands only (Actant 1), and the weapon with its inscribed "'function' of shooting" (Actant 2) together constitute a third actant, "with a new, translated program: the killing of the person against whom one wants to take revenge."[402] The question of who fired the bullet is thus no longer meaningful, as person and gun operate as "a citizen-gun, a gun-citizen."[403] What is more, each weapon has a certain script or potential inscribed – "who, with a knife in her hand, has not wanted at some time to stab someone or something?"[404] – but nonetheless human and weapon act collectively, and alternative applications of the weapon are therefore possible: the gun, as Degele points out, could be used as a hammer, for instance.[405] Admittedly, most of us would never use a gun in order to knock in a nail, but there are many other occasions where we make use of an artefact in a way that does not correspond with the inscribed script, for instance when using a lighter in order to open a beer bottle.

A further example provided by Latour, illustrating how human behaviour can be shaped by technology, is that of the door closer.[406] An automatic door-closer imposes a certain behaviour on everyone passing the door (or, at least, suggests it). For instance, one should not follow the person in front too closely, as one runs the risk of being hit by the slamming door. Everyone passing this particular door on a regular basis is well acquainted with its idiosyncrasies. Accordingly, what Schulz-Schaeffer calls "local

[401] Cf. Peter-Paul Verbeek, *What Things Do. Philosophical Reflections on Technology, Agency, and Design* (University Park: Pennsylvania State University Press, 2005), 148f.; Reiner Ruffing, *Bruno Latour* (Paderborn: Wilhelm Fink, 2009), 9-13.
[402] Verbeek, *What Things Do*, 156.
[403] Bruno Latour, "On Technical Mediation – Philosophy, Sociology, Genealogy," *Common Knowledge* 3, no. 2 (1994):32.
[404] Ibid., 31.
[405] Cf. Degele, *Einführung in die Techniksoziologie*, 128.
[406] Bruno Latour, "Mixing Humans and Non-Humans Together. The Sociology of a Door-Closer," *Social Problems* 35, no. 3 (1988):301-303.

cultures of usage" develop.[407] To make sure that people who are not familiar with the door and the workings of the door-closer can nonetheless pass it without being injured, it seems reasonable to install a hydraulic device, thereby making sure the door closes slowly. This, in turn, means that the door may be more difficult to open, which is why children and elderly people might only be able to do so making a considerable effort. Consequently, one needs to find new solutions to this problem. This simple example thus illustrates in what ways non-humans can have repercussions on human behaviour (albeit they do not single-handedly determine it).

Sociological technology studies therefore help us understand that the relation between technology and society is by no means a unidirectional one; instead, it is a web of co-dependencies and interrelations in which a concoction of various factors – such as the individual user's expertise, previous experience and intentions – play a most significant part.

3.3 Of Progress and Anxiety – Victorian Thought and Technological Determinism

In the introduction to *The Invention of Progress*, Bowler points out that

> [t]he nineteenth century saw an unprecedented acceleration in the development of material civilization. As the century began, Britain had just begun its industrialization. By the time Victoria came to the throne in 1837 the railways had begun to spread across the landscape. By the end of the century Europe and America were centres of massive industrialization with the power to dominate the world – and the world was girdled by a network of railways, steamship lines and telegraph cables that allowed vast empires to be administered.[408]

In addition to these profound material transformations, there were other spheres that witnessed equally far-reaching shifts. Darwin's theory of evolution challenged knowledge about the past and the origins of humankind, which people had previously taken for granted, and in the wake of the process of industrialization, large parts of the population faced deplorable conditions both at their workplace and in their homes. The nineteenth century is therefore widely considered a transitional period, in which

[407] Ingo Schulz-Schaeffer, "Akteure, Aktanten und Agenten. Konstruktive und rekonstruktive Bemühungen um die Handlungsfähigkeit von Technik," in *Sozionik. Soziologische Ansichten über künstliche Sozialität*, ed. Thomas Malsch (Berlin: Edition Sigma, 1998), 145. My translation. German original: "lokale Benutzungskulturen."

[408] Peter J. Bowler, *The Invention of Progress. The Victorians and the Past* (Oxford: Basil Blackwell, 1999), 1.

traditional values gradually lost validity – a process "that was often painful and that opened up massive uncertainties as to what modern values should be."[409] It was in these circumstances that the idea of progress – that is "a belief in the steady, cumulative and inevitable expansion of human awareness and power – material, intellectual, spiritual,"[410] – gained momentum and, as Bowler points out, "became central to [Victorian] thinking (…) because it offered the hope that current changes might be part of a meaningful historical pattern."[411]

As alluded to above, material developments were of paramount importance in the context of nineteenth-century transformations, and it is therefore hardly surprising that, in retrospect, it is often assumed that the "belief that in some fundamental sense technological developments determine the course of human events [had] become dogma by the end of the century."[412] Usually, we are given two different versions of this account according to which Victorian contemporaries thought that society was directly shaped by technology.

On the one hand (and inextricably linked to the idea of steady progress), there was the optimistic belief that technology would inevitably improve the human condition. It was the scientific revolution with the development of modern scientific concepts and the Age of Enlightenment and the then emerging "belief in the power of human reason to change society," which was "backed up by a world view increasingly validated by science rather than by religion or tradition,"[413] that prepared the grounds for this point of view. The notion of nature being dangerous, mysterious and beyond human control was gradually superseded by the idea that it should rather be the object of scientific investigation. Francis Bacon, one of the pioneers of modern scientific enquiry, is of peculiar importance in this context: He developed the idea that man, by means of scientific methods, should uncover the previously secret laws of nature and subsequently employ this newly gained knowledge for the benefit of humankind. The subjugation of nature is therefore an integral part of Bacon's concept. This becomes particularly obvious when he compares scientific work to torture, pointing out that "like

[409] Ibid., 2.
[410] John Bowle and Basil Wiley, "Origins and Development of the Idea of Progress," in *Ideas and Beliefs of the Victorians. An Historic Revaluation of the Victorian Age*, by the British Broadcasting Corporation (London: Sylvan Press, 1950), 33.
[411] Bowler, *Invention of Progress*, 3.
[412] Merritt Roe Smith, "Technological Determinism in American Culture," in *Does Technology Drive History? The Dilemma of Technological Determinism*, ed. Merritt Roe Smith and Leo Marx (Cambridge, MA: MIT Press, 1995), 7.
[413] Dorinda Outram, *The Enlightenment* (Cambridge: Cambridge University Press, 1995), 3.

as a man's disposition is never well known or proved till he be crossed, nor Proteus ever changed shapes till he was straitened and held fast; so nature exhibits herself more clearly under the trials and vexations of art than when left to herself."[414] He furthermore points out that humankind should "recover that right over nature which belongs to it by divine bequest."[415] With his request to acquire knowledge and, in so doing, subjugate nature, Bacon thus stands in the Christian tradition of human dominion over both the environment and the animal world.[416]

Bacon's principles were seized upon by both contemporary and successive scientists and philosophers (most famously by Descartes, Glanvill, Voltaire and Montesquieu).[417] It was only in the age of industrialization, though, that these ideas gained stronger foothold and that technologies were given what Leo Marx calls a "heroic role"[418] in that they helped improving mankind's living conditions. At the end of the nineteenth century, mankind's subordination of nature by means of scientific enquiry and technological devices was widely considered one of the most significant human achievements of the time,[419] and, given the fact that it was embedded in Christian tradition and was thought of as part of the divine scheme, helped alleviate the tensions and uncertainties mentioned above.

This becomes all the more understandable when we look at the broad range of scientific findings and technological inventions which directly or indirectly changed nineteenth-century contemporaries' lives for the better (or promised to do so in the near future). Hygienic conditions, for instance, had improved tremendously: sewerage systems were constructed, which helped eradicate cholera and typhus. With the introduction of chloroform and ether as anesthetics, medical surgery was also crucially transformed: Physicians performing an operation could now take the time they needed to treat the

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[414] Francis Bacon, *Novum Organum*, in *The Works of Francis Bacon*, vol. 4, eds. James Spedding, Robert Leslie Ellis and Douglas Denon Heath (London: Longman Green, 1858), 298.
[415] Ibid., 115.
[416] Cf. Keith Thomas, *Man and the Natural World. Changing Attitudes in England, 1500 – 1800* (London: Allen Lane, 1983), 17-25. See also Eleonora Montuschi, "Order of Man, Order of Nature: Francis Bacon's Idea of a 'Dominion' over Nature" (paper presented at the workshop "The Governance of Nature," LSE, London, 27-28 October 2010).
[417] Merchant, for instance, points to Descartes and Glanvill, speaking out "in favour of 'mastering' and 'managing' the earth." Cf. Carolyn Merchant, *The Death of Nature. Women, Ecology, and the Scientific Revolution* (San Francisco: Harper and Row, 1983), 188.
[418] Leo Marx, "The Idea of 'Technology' and Postmodern Pessimism," in *Does Technology Drive History? The Dilemma of Technological Determinism*, eds. Merritt Roe Smith and Leo Marx (Cambridge, MA: MIT Press, 1995), 253.
[419] Cf. Michael Adas, *Machines as the Measure of Men. Science, Technology, and Ideologies of Western Dominance* (Ithaca: Cornell University Press, 1989), 214.

wound properly. Owing to new methods of disinfection, chances of surviving major surgery had also risen.[420]

Developments in the field of transport and production technologies also impacted on various spheres of activity: Steam-powered agricultural machines allowed for better crops, which, in turn, could be more easily distributed throughout the country by rail.[421] These new technological and scientific developments were accordingly put on a level with the improvement of standards of living, triumph over both diseases and physical disabilities, and the victory over poverty. They were therefore thought to enable the "general advance towards greater happiness, justice and liberty."[422]

As indicated above, this heroic role attributed to technology and the technological determinist idea of agency being inherent to it also featured in the context of new media of transport and communication. This is aptly illustrated in publications such as *Triumphs and Wonders of the Nineteenth Century*, where it is among other things assumed that "navies (…) have moulded human destiny and shaped the world's progress"[423] and are therefore considered to be of "cardinal importance."[424] Likewise, the telegraph is thought of as "stimulat[ing] to improvement and new invention and discovery."[425] In these examples, the particular technology is depicted as the crucial initiator of certain developments, whereas other factors are neglected.

Closely interwoven with the idea that science and technology (and the supremacy over nature they seemed to render possible) would inevitably improve the human condition is the notion of the technological sublime. David Nye defines the sublime as the "repeated experience of awe and wonder, often tinged with an element of terror, which people have had when confronted with particular natural sites, architectural forms, and technological achievements."[426] As he points out, what was considered 'sublime' changed over time. From the early eighteenth century onwards, the notion of the sublime was drawn upon in order to describe natural phenomena, such as volcanic eruptions or thunderstorms, which were deemed both highly aesthetic and frightening at

[420] Cf. Wolfgang U. Eckart, *Illustrierte Geschichte der Medizin. Von der französischen Revolution bis zur Gegenwart* (Berlin: Springer Verlag, 2011), 139ff.
[421] Cf. Herbert Sussman, *Victorian Technology. Invention, Innovation, and the Rise of the Machine* (Santa Barbara: Praeger Publishers, 2009), 143f.
[422] Bowle and Wiley, *Origins and Developments,* 41.
[423] James P. Boyd, *Triumphs and Wonders of the Nineteenth Century. The True Mirror of a Phenomenal Era* (Philadelphia: Holman and Co., 1899). 55.
[424] Ibid.
[425] Ibid., 28.
[426] David E. Nye, *American Technological Sublime* (Cambridge, MA: MIT Press, 1994), xvi.

the same time – or, as Burke expressed it in his *Philosophical Enquiry*, first published in 1756, were considered "delightful horror."[427] With an increasing number of natural phenomena being explained scientifically, though, this 'version' of the sublime was from the early nineteenth century onwards superseded by what Leo Marx calls the "rhetoric of the technological sublime."[428] This notion of the technological sublime resulted from the "intoxicated feeling of unlimited possibility:" [429] contemporary engineers, writers and the wider public alike credited machines with mystical or metaphysical properties, treating them as if they were "part animal, part machine, part god."[430] A quintessential characteristic of the technological sublime is thus the quasi-religious feeling arising upon confrontation with machinery. At this point, though, we can distinguish several 'sub-categories' of the technological sublime: there is, for instance, the mechanical sublime, in which steam engines and the resulting means of transportation were praised for their seemingly inherent capabilities of networking a country (thereby enhancing not only commerce, but also mutual understanding, democracy and peace). This was later superseded by the enthusiasm for electricity and the corresponding "rhetoric of the electrical sublime."[431] With the actual process of transmitting messages being invisible, electric telegraphy was considered mystical and scary, and thus all the more fascinating.[432]

The notion of the technological sublime, however, also alludes to the fact that the picture of an enthusiastic reception of technology is only one side of the coin. Concerning the introduction of the electric telegraph in the United States, for instance, Czitrom declares that it was indeed "greeted (…) with a combination of pride, excitement and sheer wonder," but that there were also "plenty of expressions of doubt, incredulity, and superstitious fear. Not infrequently, observers recorded an uneasy

[427] Edmund Burke, *A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful* (London: Routledge and Paul, 1958), 73. For elaborations on what was considered "sublime" prior to the eighteenth century, cf. Nye, *American Technological Sublime*, 3-6.
[428] Leo Marx, *The Machine in the Garden. Technology and the Pastoral Ideal in America* (London: Oxford University Press, 1979), 195.
[429] Ibid., 198.
[430] John F. Kasson, *Civilizing the Machine. Technology and Republican Values in America, 1776 – 1900* (New York: Hill and Wang, 1999), 162.
[431] James W. Carey and John J. Quirk, "The Mythos of the Electronic Revolution," *American Scholar* 39, no. 3 (1970):396. Nye, in turn, proposes another categorization and distinguishes, amongst other things, between the dynamic technological sublime (railroads, steamships, telegraphy) and the geometrical sublime, which is characterized by "elegant design and sheer bulk" and can be found in bridges, skyscrapers, and the like. Cf. Nye, *American Technological Sublime*, 77.
[432] Cf. Carey, "Technology and Ideology," 307.

mixture of these feelings." [433] Not all of the tensions and fears evoked by the developments nineteenth-century contemporaries witnessed could be alleviated by the idea of progress. As a result, we are nowadays also presented a gloomy and pessimistic account of how contemporaries thought technology would shape society and impact on individual's lives. Indeed, there were technosceptic, if not technophobic, notions of how technology would harm humankind and social life, rather than ushering in an era of peace, liberty and welfare. The reasons for such feelings of skepticism and fear are manifold and there was never a coherent group unified by a single agenda, but various rationales. Along with Enlightenment thinkers' faith in human competence to uncover the secrets of nature through scientific enquiry, for instance, a romantic counterculture had emerged. Its adherents opposed the proceeding rationalization; instead, they relied on imagination and intuition.[434] In this connection, Linda Simon[435] refers to Samuel Coleridge, one of the central figures of English Romanticism, who waspishly remarked that genuine enlightenment was to be found reading Shakespeare or Milton – what scientists, in turn, had to offer, he declared condescendingly, was mere knowledge.[436]
Others criticized the dehumanizing effects resulting from the mechanization of work processes – which was also feared to render qualified craftsmen unnecessary and thus cause large-scale unemployment – and pointed to the devastating effects on the workers' physical and mental health or their alienation from the final product.[437] Moreover, contemporaries were anxious about the physical ramifications of certain technologies: it was, for instance, assumed that noise, speed and vibrations one had to endure during a train journey were to leave their mark of passengers' health, and that electricity would cause apoplectic strokes.[438]

[433] Daniel J. Czitrom, *Media and the American Mind. From Morse to McLuhan* (Chapel Hill: University of North Carolina Press, 1982), 6.
[434] Cf. Ellen Judy Wilson, *Encyclopedia of the Enlightenment*, ed. Peter Hanns Reill (New York: Facts on File, 1996), 366f.
[435] Cf. Simon, *Dark Light*, 22.
[436] Cf. Coleridge to Robert Southey, 11 August, 1801. Collected Letters of Samuel Taylor Coleridge, vol. 2, ed. Earl Leslie Griggs (Oxford: Clarendon, 1956), 751.
[437] Cf. Sussman, *Victorian Technology*, 146-149.
[438] Cf. Schivelbusch, *Geschichte der Eisenbahnreise*, 106-110; Simon, *Dark Light*, 145.

3.4 Chapter Summary

This chapter has served a dual purpose. To start with, it has considered various approaches towards the relationship between society and technology. It has first of all taken a closer look at the theories of technological determinism, on the one hand, and the social determination of technology, on the other, neither of which is deemed adequate any longer as they do not take into consideration technologies as they are actually used. They have thus been superseded by sociological theories focusing their attention on the actual application of technologies. In so doing, these theories stress the importance of the human actors' intentions, their acquaintance with the 'tool' they are using and the reciprocity between humans and technology.

Further, the chapter has defined what can best be described as 'conventional' accounts of Victorian attitudes towards science and technology. According to these accounts, contemporaries viewed these two areas as primary agents of change, which would either inevitably improve the human condition (a view embedded in the rationale of the Enlightenment) or cause social hardships and physical harm without contributing to what adherents of the Romantic movement deemed 'worthy knowledge'. This chapter has thus provided a basic analytical framework for the subsequent chapters.

"…*she liked being the mistress who put the demon of steam into harness.*"[439]

4. Transport and Communication Technologies in Context(s) – Notions of Progress, Subordinating Nature and the Technological Sublime

The fundamental relevance of the idea of progress having been elaborated, it is hardly surprising that this Victorian belief in steady, ongoing improvement, the subjugation of nature and the 'technological sublime' appear frequently in reporting on nineteenth-century scientific and technological developments. It also features eminently in coverage on contemporary transport and communication technologies. This chapter is an overview and analysis of the various contexts in which the notions of progress, the subjugation of nature and the technological sublime are referred to in connection with transport and communication technologies. Along the lines of Hempstead's research on the representation of transatlantic telegraph cables, the chapter is going to illustrate how these technologies were embedded into social history and existing cultural frameworks.

4.1 Transport and Communication Technologies: A Tale of Progress

Contemporaries were well aware of the staggering number of scientific and technological developments unfolding in the nineteenth century and often depicted them as defining features of the period. With regard to the opening of the Great Exhibition, for instance, the *Illustrated London News* points out that

> if (…) we take any space of a hundred years – or even of two hundred years – in our own history, or in that of any other people in the ancient or modern world, we shall not find, within either of those periods, the records of such progress in all the arts which elevate and adorn humanity, and extend its power for good, as we do in the twenty years which have elapsed since 1830. The ball of improvement has rolled with accelerated velocity, increasing its impetus as it went.[440]

Similarly, in the *Visitor's Guide to the Great Eastern*, the readers are reminded that

> [i]t is indeed an extraordinary age, – an age of unparalleled enterprise, of surprising discoveries and inventions, of herculean constructions and scientific revolutions, – an age that has given birth to truly unique and unparagoned productions, – an age of enlightenment and inquisitiveness, – an age of engineering achievements which a

[439] Rohinton Mistry, *Family Matters* (London: Faber and Faber, 2006), 100.
[440] "The Great Exhibition," *Illustrated London News*, 3 May 1851, 343.

> century ago, had they been possible, would have marked an epoch, – an age, in which the circle of universal knowledge is rapidly expanding, – an age in which the starting discoveries of the secrets of nature are going on under the scrutinizing researches of experimental philosophy, – an age distinguished beyond any other in our history by a number of great men, famous in different ways, and whose names will go down to posterity with unfading honours.[441]

In this connection, it is deemed particularly noteworthy that these discoveries and inventions do not "come upon us (…) singly, but in troops, – not in gentle showers and meandering streams, but with the rapidity, the copiousness, and the force of an inundation."[442] Ten years later, the *Manchester Guardian* reprints an article from the *Spectator*, which takes the same line, pointing out that

> [f]ew phenomena are more remarkable, yet few have been less remarked, than the degree in which material civilisation – the progress of mankind in all those contrivances which oil the wheels and promote the comfort of daily life – has been concentrated into the last half-century. It is not too much to say that in these respects more has been done, richer and more prolific discoveries have been made, grander achievements have been realised, in the course of the 50 years of our own lifetime than in all the previous lifetime of the race, since states, nations, and politics, such as history makes us acquainted with, have had their being.[443]

All of these passages refer to the concentration of scientific and technological developments in the course of the past decades and make no mention of a specific innovation. Elsewhere, however, we find the importance of improved means of transport and communication or one particular technology being emphasized. In the Exhibition Supplement to the *Illustrated London News*, it is pointed out that "the first successful application of Electricity to the wants of man will ever distinguish the present reign as an important era in scientific history."[444] The article outlines various fields of application – among other things, electric telegraphy – and concludes that "[t]he first practical appliances of electricity will render the reign of Queen Victoria famous in scientific history."[445] In the *Visitor's Guide to the Great Eastern*, it is similarly declared that the "last half century (…) is the most remarkable period in the history of the world," primarily because of the

[441] Jackson, *Visitor's Guide to the Great Eastern*, 4.
[442] Ibid.
[443] "Concentrated Progress of the World," *Manchester Guardian*, 5 August 1868, 3.
[444] "On the Applications of Electricity," Exhibition Supplement, *Illustrated London News*, 10 May 1851, 397.
[445] Ibid., 400.

> almost universal application of steam to the processes of manufactories and agriculture. Of this energy and progress, railroads and the electric telegraph are at once the most prominent and fittest symbols.[446]

Similarly, the *Observer*, reporting the laying of the 1858 transatlantic cable, generally asserts that the "nineteenth century has been so pregnant with great scientific results, that (…) it seems hardly credible that all the vast improvements that have been effected are really the products of man's ingenuity and thought:"[447] steam-powered ships and railways are mentioned as illustrations of these improvements, but the electric telegraph is considered particularly significant in this context:

> [T]he advance that has been made in this all-powerful [*sic*] auxiliary to man's industry sinks comparatively into insignificance when placed in juxtaposition to the wonders wrought by electricity, the power of which, moreover, must yet be regarded as in its infancy. As science has again and again achieved some great triumph, it has been customary to class the last production as the greatest, and at the present time the men of science and intellect are congratulating one another on the success of the greatest work that certainly has hitherto yet been completed. The connection of the old and new worlds by means of electricity is, in truth, such a marvel that if one had predicted it only some ten years since it would have qualified him to have been thought worthy of a residence in Bedlam.[448]

In the previously quoted article originally published in the *Spectator* and reprinted in the *Manchester Guardian* (and aptly titled "Concentrated Progress of the World"), gunpowder and printing are suggested as "two of the most remarkable inventions of all time," one being "four, the other five, centuries old."[449] It is pointed out, though, that throughout the centuries, they were not changed significantly: in fact, major improvements were not made until the beginning of the nineteenth century. Nonetheless, other developments are considered even more important:

> [I]t is in the three momentous matters of light, locomotion, and communication that the progress effected in this generation contrasts most surprisingly with the aggregate of the progress effected in all previous generations put together since the earliest dawn of authentic history.[450]

In *The Mont Cenis Tunnel Construction,* readers are told that it is

> a fine boast of our age that of having initiated and completed the greatest work which can honour the genius of man, such as are the junctions of two continents by means of

[446] Jackson, *Visitor's Guide to the Great Eastern*, 3.
[447] "The Atlantic Telegraph and its Probable Results," *The Observer*, 8 August 1858, 6.
[448] Ibid.
[449] "Concentrated Progress of the World," *Manchester Guardian*, 5 August 1868, 3.
[450] Ibid.

> the trans-atlantic [*sic*] cable, the canal of Suez, the railway of the Pacific, the piercing of the Cozian Alps.[451]

Similarly, the *Illustrated London News* describes the Mont Cenis Tunnel as "a characteristic achievement of the nineteenth century."[452] Generally speaking, it is therefore safe to assume that the new transport and communication technologies are considered to epitomize the progressiveness of the era.

What is important to note in this context is that it is not only the sheer quantity of scientific findings and technological innovations – specifically of transport and communication technologies – that differentiates the nineteenth century from previous centuries. It is their utilitarian aspect in combination with the fact that an increasing number of people from all strata of society have access to and benefit from these emerging technologies that distinguishes the era. In contrast to technologies of previous centuries (and of other nations, as will be seen in chapter 7), which were only accessible to a social elite, contemporary means of transport and communication are considered to be at the general public's disposal. In an article covering the opening of the Great Exhibition, the *Illustrated London News* therefore anticipates

> that the blessings of civilisation – both moral and physical – will extend to and thoroughly permeate a far more numerous class than those which are now familiar with them. There is a lower and larger substratum to be reached, which has already begun to feel the benigner influences. [453]

A similar idea is conveyed in the same magazine's reporting on the Crystal Palace. Here, it is first of all pointed out that

> [t]he Building itself – the fitting shrine for the objects of mingled beauty and utility which it encloses – is as original and novel as the occasion; and if the ancient peoples had advanced far enough in civilisation, and had possessed wisdom enough to conceive such a project as this friendly rivalry of the industrious workers of all climes and races, the Building would have been commemorated by the history and tradition of three thousand years, in the songs of barbs and in the proverbs of the people, as a wonder of the world, worthy to rank with the Pyramids, or with the gates and walls of Thebes or Palmyra for its greatness, and with the Colossus that bestrode Rhodes harbour for its beauty.[454]

Subsequently, however, it is emphasized that

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[451] *The Mont Cenis Tunnel*, 82.
[452] "The New Overland Route and the Alpine Railway Tunnel," *Illustrated London News*, 6 February 1869, 133.
[453] "The Great Exhibition," *Illustrated London News*, 3 May 1851, 344.
[454] "The Great International Exhibition," Exhibition Supplement, *Illustrated London News*, 10 May 1851, 391.

> the Crystal Palace has the merit of surpassing all these in the true nobility of the purposes for which it was erected. It is no vast monument of a still vaster pride and vanity, like the Pyramids; it is not, like the gates and walls of the ancient cities of the east, a bulwark against the encroachments of vindictive and rapacious enemies; nor, like the Rhodian Colossus, a useless, although splendid, ornament of a great capital. Different from and more excellent than these, it is sanctified by a high purpose, the highest, indeed, known to that practical religion, which, including all objects of human interest, preaches not simply love to God, but good-will to men.[455]

In a speech given at the annual congress of the Institution of Mechanical Engineers (and subsequently printed in the *Manchester Guardian*), Sir William Armstrong points out that one is "naturally led to compare [the Suez Canal] to the great neighbouring relics of Egyptian antiquity," and comes to the conclusion that "[i]n its moral and intellectual aspect [the canal] is immeasurably superior."[456] This is assumed to be due to the fact that "the modern work will bear witness to the practical science and utilitarian spirit of our better times," whereas the Pyramids are considered "a useless monument of the idle vanity of a tyrant."[457] Similarly, in *The Mont Cenis Tunnel,* it is pointed out that "ancient works (…) commonly aimed only at gratifying the ambition of some potentate, or if they aimed at general utility, statecraft, egotism and distrust held them fettered in limits too small and narrow of the nation which had raised them."[458] Also referring to the Mont Cenis Tunnel, *Lloyd's Weekly Newspaper* notes that "[t]he triumphs that intelligent Labour is seeking are those which shall make *all* men participators, in just degrees, in the benefits of [the tunnel]."[459] [my italics]

As previously indicated, transport and communication technologies are embedded into multi-layered historical, social and cultural frames of reference. These are used for various purposes, which, *prima facie,* may appear contradictory: on the one hand, such references are made to emphasize the contrast between contemporary technologies and previous ones (be they 'real' historical predecessors or belonging to the realm of myths and literature), stressing the unidirectional course of history and the progressiveness and superiority of the latest developments. On the other hand, though, by referring to ancient accomplishments, current technological achievements are depicted as following in the steps of bygone advanced civilizations. What is more, as Hempstead has argued, these references served the purpose of familiarizing the public with these new technologies.

[455] Ibid.
[456] "Sir William Armstrong on Mechanical Inventions," *Manchester Guardian*, 5 August 1869, 8.
[457] Ibid.
[458] *The Mont Cenis Tunnel,* 82.
[459] "A Busy Pleasure Week," *Lloyd's Weekly Newspaper*, 24 September 1871, 6.

At this point, it is therefore first of all worthwhile to look at the astonishingly wide spectrum of references made in nineteenth-century newspapers and periodicals, aptly illustrated in the following passages. Given the fact that there is a wide variety of means of transportation on display at the Great Exhibition – "carriages, cabs, locomotive engines, and other means of conveyance"[460] – the *Illustrated London News* argues that man "might be appropriately distinguished from the brute creation by the definition of a coach-building animal."[461] In this connection, it is further emphasized that

> [f]rom the days of the charioteer John, who, we are told in Scripture, 'drove furiously;' from the days of the old Assyrians, Ninevites, and Babylonians, of whom we have the sculptured representations as they appeared in their chariots of war; from the days of the Olympic chariot races; from the days of the ancient Britons, who, Cæsar tells us, garnished their coach-wheels with scythes, down to the present time, when fast men drive about in Hansom cabs; when hard-worked mechanics take a shilling trip by railway into the green fields; and when even the poorest occasionally indulge in a threepenny omnibus to Camden-Town, or other suburban retreats – we have continued evidence of other means of locomotion than the two legs with which nature has endowed us. [462]

Here, transport technologies are described as an achievement by means of which humankind could be distinguished from the animal world. Further, present-day technologies of transport are described as a natural result of a lengthy evolutionary process.

The *Manchester Guardian*, on the other hand, juxtaposes the most recent developments in the field of transport and communication technologies to historical forerunners:

> Nimrod and Noah travelled just in the same way, and just at the same rate, as Thomas Assheton Smith and Mr. Coke of Norfolk. The chariots of the Olympic Games went just as fast as the chariots that conveyed our nobles to the Derby, 'in our own hot youth, when George [Third was king.' [*sic*] When Abraham wanted to send a message to Lot he despatched a man on horseback, who galloped 12 miles an hour. When our fathers wanted to send a message to their nephews, they could do no better, and go no quicker. When we were young, if we wished to travel from London to Edinburgh, we thought ourselves lucky if we could average eight miles an hour – just as Robert Bruce might have done. Now, in our old age, we feel ourselves aggrieved if we do not average 40 miles. (…) The same at sea. Probably, when the wind was favourable, Ulysses, who was a bold and skilful navigator, sailed as fast as a Dutch merchantman of the year 1800, nearly as fast at times as an American yacht or clipper of our fathers' day. Now, we steam 12 and 15 miles an hour with wonderful regularity, whether wind and tide be favourable or not; nor is it likely that we shall ever be able to go much faster.[463]

[460] "Carriages and Locomotive Engines," Exhibition Supplement, *Illustrated London News*, 10 May 1851, 401.
[461] Ibid.
[462] Ibid.
[463] "Concentrated Progress of the World," *Manchester Guardian*, 5 August 1868, 3.

The developments in the field of communication, though, are considered to be even more outstanding:

> But the progress in the means of communication is the most remarkable of all. In this respect Mr. Pitt was no better off than Pericles or Agamemnon. If Ruth had wished to write to Naomi, or David to send a word of love to Jonathan when he was a hundred miles away, they could not possibly have done it under 12 hours. Nor could we to our friends 30 years ago. In 1867 the humblest citizen of Great Britain can send such a message, not a hundred miles, but a thousand, in 12 minutes.[464]

These brief extracts thus contain a noteworthy potpourri of historical, social and cultural references, ranging from biblical figures and various ancient civilizations to Greek antiquity and mythology and notable historical figures such as Robert Bruce (King of Scots in the early fourteenth century) and "Mr. Coke of Norfolk."[465] In particular the passage from the *Manchester Guardian* already provides a clue as to how juxtaposing and comparing previous modes of conveyance and communication could underline the claim that the past fifty years have experienced outstanding technological developments.

As Hempstead has illustrated and as the passage from the *Manchester Guardian* has shown, it was biblical imagery that was particularly often drawn upon in reporting on electric telegraphy. Similarly, biblical motifs were also employed in the context of the *Great Eastern* steamship, Noah's ark not surprisingly being the most common. The *Times*, for instance, suggests that

> [w]hoever wants to feed this natural passion for size in the primitive way, and to see a true giant in its own line, must visit the bank of the Thames at Millwall. But before he goes we recommend him, unless he is very well versed in the Book of Genesis, to turn to the 6th chapter, and refresh his memory as to the dimension of NOAH'S Ark [*sic*] and the 'fashion' of its making: 'The length of the Ark shall be 300 cubits, the breadth of it 50 cubits, and the height of it 30 cubits.' So, reckoning the cubits at a foot and a half, we have a ship 450 feet long, 75 feet broad and 45 feet high.[466]

Accordingly, the conclusion is drawn that "to [the *Great Eastern*] even NOAH's Ark must yield precedence."[467] Two days later, the *Times* publishes a letter in which a reader pursues this comparison between the ark and the *Great Eastern* and elaborates further on their respective length and tonnage.[468] A similar comparison can also be found in the

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[464] Ibid.
[465] "Mr Coke of Norfolk" refers to Thomas Coke, Earl of Leicester (1754 – 1806), Member of Parliament in the late eighteenth and early nineteenth century; Thomas Assheton Smith (1752 – 1828) was Member of Parliament from 1774 to 1780; "Mr. Pitt", in all likelihood refers to William Pitt the Younger (1759 – 1806), Prime Minister of Great Britain (and the United Kingdom, respectively) in the late eighteenth and early nineteenth century.
[466] "Among the Passions," *The Times*, 18 April 1857, 8.
[467] Ibid.
[468] Cf. "Noah's Ark and the Great Eastern," *The Times*, 20 April 1857, 12.

Great Eastern Steam Ship[469] and in the *Illustrated London News*, where it is briefly remarked that the *Great Eastern* is "larger than the ark itself."[470] As these passages aptly demonstrate, the Bible remained a most powerful and significant cultural reference and was drawn upon in order to illustrate the magnitude of the *Great Eastern* steamship.

As has been seen, Greek mythology is likewise plundered in order to illustrate the impressive scale of contemporary technological systems. In his publication on *The Suez Maritime Canal*, Stoess describes how the construction of the canal could only be carried out in such a relatively short space of time owing to the "colossal creations of modern mechanics." According to him, the "largest conception of power which the ancients were able to form: Hercules, and even Briareus with his hundred arms appear (...) as pigmies" when compared to these modern devices.[471]

The *Times* draws upon Scandinavian mythology in order to illustrate the dimension of the first transatlantic cable of 1857, comparing it to the Jörmungandr serpent, which, according to Norse legend, circles the globe:

> There in a comparatively small compass, coil over coil, till the eye is pained and dazzled in attempts to follow it, lies the monstrous cable, like the endless snake of the Scandinavian mythology, which was said to encircle the world.[472]

Reporting the Mont Cenis Tunnel, the *Liverpool Mercury* in turn refers to Hannibal's crossing of the Alps:

> The passage of the Alps, by the army of Hannibal, at no great distance from the line through these mountains which has just been opened, was considered one of the most wonderful exploits of ancient times; but it sinks into insignificance in comparison with the skill and the patience which have been displayed in constructing a passage through these mountains, which is likely to remain open through all succeeding time, and for the use of all the nations of the world.[473]

It should be hardly surprising contemporary writers frequently compared the Suez Canal with the great constructions of ancient Egypt, most notably the pyramids. In his speech, Armstrong points out that in terms of "quantity of the material moved, the Suez Canal is

[469] Cf. *The Great Eastern Steam Ship: A Description of Scott Russell's Great Ship, now Building at Millwall, for the Eastern Steam Navigation Company* (London: [1857]), 24.
[470] "The Departure of the Great Eastern," *Illustrated London News*, 10 September 1859, 241.
[471] Carl Stoess, *The Suez Maritime Canal. A Sketch of the Undertaking* (Liverpool: Webb, Hunt and Ridings, 1869), 46.
[472] "The 'Great Eastern'," *The Times*, 30 April 1857, 12.
[473] "The New Road Through the Alps," *Liverpool Mercury*, 20 September 1871, 6.

far more vast than the great Pyramid."[474] Referring to ancient canal constructions, the *Scotsman* notes that

> [w]onderful is the difference between the mechanical means at the command of the ancients and the moderns respectively, enabling a French engineer to accomplish a work four times greater in one-tenth of the time compared with the utmost efforts of the Pharaohs and all their hosts.[475]

On the very day of inauguration, the *Times* solemnly declares that the

> enterprise at which the PHARAOHS and the PTOLEMIES [*sic*], with other Sovereigns of the intervening dynasties, laboured at different periods and with various success throughout the centuries of remote antiquity is now announced as virtually achieved.[476]

What is noteworthy is that these ancient canal constructions are not only alluded to in order to point up the superiority of contemporary technological skills. Instead, they are also identified as the predecessors of one of the great contemporary engineering feats. In his publication on *The Suez Canal, the Eastern Question, and Abyssinia*, for instance, Fitzgerald points out that "[c]anal communication is supposed to have existed from sea to sea, at all events since the time of Abraham, throughout the greater part of the eventful history of Egypt"[477] (thus also referring to a biblical figure). A primary example for this is also to be found in the above-quoted article published in the *Scotsman*, in which the difference between ancient and modern mechanical devices is emphasized and the superiority of the latter championed; following the passage cited above, however, the article continues as follows:

> But more wonderful still is the thought that, thousands of years before steam or almost any other of our great mechanical agencies had existence, such a work as the ancient canal between the Nile and the Red Sea could have been accomplished or, even conceived.[478]

Moreover, attention is called to the fact that the

> ancient canal was in use for many centuries, and is supposed to have been destroyed in the end only by barbaric violence. It seems indeed also to be true that, several times before its obstruction or abandonment, it was sanded up; but (…) whenever there was internal tranquility, with moderately vigorous rulers, little difficulty appears to have been experienced in restoring it to use. If the ancients, with their imperfect knowledge and comparatively contemptible means, could thus keep their canal from being permanently filled up by the drifting sands, can there be imminent

[474] "Sir William Armstrong on Mechanical Inventions," *Manchester Guardian*, 5 August 1869, 8.
[475] "Egypt: The Opening of the Great Canal," *The Scotsman*, 12 November 1869, 2.
[476] "The Suez Canal," *The Times*, 17 November 1869, 6.
[477] W. F. Vesey Fitzgerald, *The Suez Canal, the Eastern Question, and Abyssinia* (London: Longmans, Green, and Co, 1867), 52.
[478] "Egypt: The Opening of the Great Canal," *The Scotsman*, 12 November 1869, 2.

> danger from that and similar quarters to a work in charge of those possessing both experience and power so far transcending?[479]

At this point, it becomes startlingly clear that the seeming contradictory depictions – the contrasting juxtaposition of ancient and modern constructions and the highlighting of the superiority of the latter, on the one hand, and their portrayal as following in the footsteps of past high cultures, on the other – are not necessarily mutually exclusive. These different ways of representing progress can actually be complementary. By referring to ancient predecessors, contemporary technology can be depicted as a continuation and conclusion of a lengthy development process. In so doing, Western civilization (bear in mind that the Suez Canal was a French project) is portrayed as being on a par with advanced civilizations of the past; the superiority of these current technologies, in turn, characterizes them as typical nineteenth-century achievements and bears witness to the progress which has been achieved in the most recent past.

Allusions to ancient Egyptian structures are not confined to the Suez Canal, though. Reporting the construction of the Mont Cenis Tunnel, the *Illustrated London News* declares that "[o]nce done, it will be done for ever; it will endure with the Alps themselves and rank among those noble works of antiquity, the Pyramids of Egypt and the Roman roads and aqueducts, which appear to defy the wasting power of time."[480] The *Great Eastern* steamship is repeatedly compared with the Seven Wonders of the World (the Great Pyramid of Giza being one), for instance when it is pointed out in *The Great Eastern Steam Ship* "that we can rationally regard that huge vessel as the latest wonder of the world. The ancients had their seven wonders, but never such a wonder as this."[481] The *Illustrated London News* takes the same line, at the same time emphasizing the utilitarian aspect of nineteenth-century achievements:

> What compared to her, either for physical beauty and grandeur, or for a great and civilising purpose, were any of the 'seven wonders of the world' that so charmed the imagination of the ancients? The Pyramids of Egypt, the Sepulchre of Mausolus, the Colossus of Rhodes, and the Statue of Jupiter were but monuments of extravagant folly and vanity, without the least purpose of utility. The Palace of Cyprus, the Temple of Diana, and the Walls of Babylon were beautiful and costly; but even in their beauty and cost they are rivalled, and in their usefulness they are exceeded, by this noble vessel.[482]

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[479] Ibid.
[480] "The New Overland Route and the Alpine Railway Tunnel," *Illustrated London News*, 6 February 1869, 133.
[481] *Great Eastern Steam Ship*, 4.
[482] "The 'Big Ship'," *Illustrated London News*, 13 August 1859, 148.

Besides the accomplishments of the ancient civilizations of Greece and Egypt, those of British origin are also used by means of comparison. The *Great Eastern* is, for instance, compared to the prehistoric structure of Stonehenge. Concerning her launch, the *Illustrated London News* anticipates that

> [i]f such a mass of iron and wood, weighing thousands of tons, could be precipitated into the water with comparative ease and facility, the launch would constitute as remarkable an event as any in the calendar of human invention. Some of the stupendous erections of the ancients, which have puzzled the disciples of modern science, would cease to be perplexities, and Stonehenge would no longer be invested with fabulous attributes.[483]

Moreover, the *Visitor's Guide to the Great Eastern* refers to the naval architectural achievements of the various peoples which dominated the British Isles between late antiquity and the early modern period:

> Our Saxon forefathers were proud of our ships, and Alfred the Great constructed vessels of an entirely new plan; the Anglo-Normans made considerable improvement on the Saxon vessels, and their (…) ships, which bore Richard and the Crusaders to the Holy Land, excited universal admiration. Henry V. maintained our national supremacy on the sea, and humbled all the maritime powers of Europe.[484]

In so doing, the *Great Eastern* is seen in a long-standing seafaring tradition, represented as a defining feature of British national identity (see also chapter 7). Furthermore, the nineteenth century's superiority is emphasized by comparison between the *Great Eastern*'s size and tonnage and that of the fleets of Henry VII and Elizabeth I, which, according to the *Visitors's Guide*, "were (…) utterly insignificant when compared with those of our own times."[485]

As Hempstead has noted, Shakespeare's plays, specifically *A Midsummer Night's Dream*, were plundered in order to emphasize the speed with which information travelled along the transatlantic submarine cable. As early as 1851, the *Illustrated London News*, describing contemporary scientific developments, makes reference to *A Midsummer Night's Dream*:

> The present is said to be an age of great ideas; and, without flattering the age unduly, it must be admitted that, in some respects, it deserves the appellation. The splendid achievements of modern science – which allows the man of the nineteenth century to see as much of the world in a day as his forefathers could see in a fortnight, and which promises, by means of electricity, to 'put a girdle round about the earth' in much less than 'forty minutes,' and thus outdo in sober reality what the Puck of the poet's fancy

[483] "The 'Great Eastern' Steam Ship," *Illustrated London News*, 7 November 1857, 450.
[484] Jackson, *Visitor's Guide to the Great Eastern*, 8.
[485] Ibid.

> suggested as within the power of the fairies, but not of men to perform – accustom the popular mind to the reception of great ideas.[486]

Twenty years later, the *Liverpool Mercury* reprints an article from the *Daily News* in which the various options as to a cable connecting the Pacific Coast of North America with either Russia or Japan are being discussed. Considering the "rapid development of submarine telegraphy (…) one of the chief marvels of our age,"[487] it is pointed out that

> [a]s soon as either of the routes, which we have been able authoritatively to describe, is completed, the earth will be belted with telegraphic cables. When 'Puck's girdle' has spanned the Pacific, it will be easy enough to send a message round the globe in '40 minutes' – a sufficiently near realisation of the great dramatist's oft-quoted line to make his fancy appear prophetic.[488]

Hempstead has also shown that "[t]he vision of the telegraph engineer as a pioneer moving into unknown, intellectual territory was powerful,"[489] and that the expeditions of Columbus and other explorers were evoked to describe the cable-laying missions of the 1850s and 1860s. Medieval and early modern explorations are also drawn upon in the publications under scrutiny, stressing the seeming resemblance of nineteenth-century technological achievements and these earlier undertakings. The *Times*, reporting the laying of the 1858 transatlantic cable, calls attention to how everyone had "wondered at the smallness of the craft in which COLUMBUS, DRAKE, MAGELLAN, [*sic*] and other discoverers plunged into the darkness of other seas and worlds"[490] and emphasizes the exceptional courage these men displayed, as they "penetrat[ed] distant seas for the first time in undecked vessels, so small that they could sit on the gunwale and bathe their feet in the tranquil seas."[491] Subsequently, it is then pointed out that "it is quite clear that the Agamemnon was as utterly unequal to her stupendous freight as the galliots and barks of our early discoverers."[492] The *Liverpool Mercury* also refers to Columbus (and, once again, to Shakespeare), reminding its readers that

> [t]he contemporaries of Columbus but faintly appreciated the significance of his tidings of a new world beyond the setting sun; and we of this day can only imperfectly realise all that is summed up in the proved possibility of putting a girdle round the earth and linking the old world and the new in instantaneous communication.[493]

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[486] "American 'Notions'," *Illustrated London News*, 14 June 1851, 543.
[487] "A Telegraph Round the Globe," *Liverpool Mercury*, 21 October 1871, 5.
[488] Ibid.
[489] Hempstead, "Representations of Transatlantic Telegraphy," 19.
[490] "We Think it no Little Honour," *The Times*, 15 July 1858, 8.
[491] Ibid.
[492] Ibid.
[493] "The Atlantic Telegraph," *Liverpool Mercury*, 10 August 1858, 8.

With regard to the opening of the Suez Canal, the *Illustrated London News* highlights its future significance, anticipating that it will introduce "a new, and for the present incalculable, factor (…) into the traffic of the world;" therefore it declares that a "grander fact, or one more likely to affect the material condition of mankind, has not occurred since the discovery of America by Columbus."[494] In the same manner, the *Scotsman* refers to Vasco da Gama, claiming that the Canal "may be to the world at large almost as great a boon as the discovery of the road to India by the Cape of Good Hope."[495]

As has been pointed out previously, the passages cited would seem to point to the conclusion that the transport and communication technologies in question were frequently drawn upon as symbols of the progressiveness and decisive superiority of the nineteenth century. This was done either by juxtaposing them to traditional myths, literary visions and technological achievements of earlier times, or by describing them as the fruits of lengthy development processes initiated by great civilizations, or by a combination of both.

Beyond that, however, it was also speculated about the developments these technologies might entail in future times. In the publications under review, it is widely assumed they would have positive effects, although it is frequently stressed that one could not determine how exactly these were to manifest themselves. Accordingly, the relevant passages often remain rather vague. The *Illustrated London News*, for instance, referring to the cable of 1858, declares that "[n]o one can presume to calculate the results of this scientific victory,"[496] and the *Scotsman* similarly points out that the laying of the cable is "altogether a wonderful and admirable triumph of modern science, ingenuity, and enterprise – one which we can yet scarcely comprehend in its fulness, far less over-rate."[497] [*sic*]

As to the laying of the 1866 transatlantic cable, the *Times* remarks that "[h]uman interest very naturally fixes upon those great and bold efforts the aim of which is to *raise mankind* from one step to another, to *give it a grander unity* or a *stronger hold* on this material creation;"[498] [my italics] the *Observer* likewise declares that "[i]t is

[494] "Opening of the Suez Canal," *Illustrated London News*, 27 November 1869, 525.
[495] "Among the Years," *The Scotsman*, 31 December 1869, 2.
[496] "The Whole Civilised World," *Illustrated London News*, 7 August 1858, 124.
[497] "The Accounts Published," *The Scotsman*, 11 August 1858, 2.
[498] "We Think it no Little Honour," *The Times*, 15 July 1858, 8.

impossible to over-estimate [*sic*] the value of this means of communication between England and America, or to forecaste [*sic*] the benefits which it will confer upon the two people who are now so intimately connected together."[499] In a similar manner, the *Illustrated London News* again makes clear that "[w]e cannot foretell, we cannot, perhaps, conceive, the precise forms in which the amelioration will appear, or in what manner or in what proportion it will affect the material, the political, the moral, or the spiritual good of mankind."[500] In addition to that, it is pointed out that "[w]e have cast the net, but we know not yet all that it incloses; and, amongst many takes, some of them will answer our anticipations, and some unquestionably will surprise us."[501]

About eight months prior to the inauguration of the Suez Canal, the same magazine assumes that the canal "may tell with beneficent power upon the conditions of nations, East and West, for ages yet to come."[502] Pointing out that "[it] is not given to us to foresee all the indirect and collateral benefits which, assuming its perpetuity, it will confer upon the two great branches of the family of man,"[503] the article sets forth speculations:

> But who can pretend to foresee the vast variety of moral influences which will take their origin from this apparently slight geographical change; in what manner they will act and react upon nations even the most remote from each other; what will be their effect upon social customs, modes of thought, and habits of life; or in what degree or with what result they will modify the philosophies or the religious beliefs of men coming fully within their range? The ceremony of Thursday week tempts imagination to a bolder flight into the region of the unknown than is usual in these prosaic times; and, happily, the glimpse thereby obtained of the likelihoods and possibilities which grow out of it harmonises with the confidence we place in the laws which govern human destinies, and encourages us to anticipate from it a vast preponderance of good over evil.[504]

The case of the Mont Cenis Tunnel is especially interesting, as it is depicted as having particularly beneficial effects on the future on Italy. Firstly, the economic backwardness of the newly united kingdom is described. There is an overwhelming consensus that Italy, due to its geographical location south of the Alps and the resulting seclusion, has previously not been able to keep up with developments in other European countries. The *Scotsman*, for instance, points out how "until now the land of the vine has been almost Extra-European. She has been of us, but not among us; the disabilities imposed upon her

[499] "Completion of the Atlantic Tele-Graph," *The Observer*, 29 July 1866, 6.
[500] "The Anglo-American Telegraph," *Illustrated London News*, 4 August 1866, 102.
[501] Ibid.
[502] "The Suez Canal," *Illustrated London News*, 27 March 1869, 301.
[503] Ibid.
[504] Ibid.

by nature have been of such a kind that she could not be considered a unit among the Great Powers."[505] In *The Mont Cenis Tunnel*, it is similarly described how the

> ranges of the Alps have always been more or less a barrier to the intercourse of Italy with the Northern countries of Europe. Several centuries ago this barrier or impediment was unimportant; but as the Northern countries advanced in civilization, the effect of this mountain-barrier was to cut off Italy from participation in their growing prosperity, and to reduce it to a state of comparative isolation.[506]

The *Times* also depicts how communication between France and Italy was at times seriously disturbed during wintertime, when "the mountain roads are sometimes impassable, often dangerous, and always difficult and inconvenient;"[507] therefore, "until the completion of [the tunnel] it could not be said that the two countries had that power of constant and unrestricted intercourse which we have learnt to look upon as essential to nations."[508]

All this, it is assumed, is to change with the opening of the tunnel, by means of which intercourse with Italy will be facilitated enormously. The *Scotsman* therefore expects that, once "that disability passes away," Italy will assume "the position for which the genius of her people has in all times eminently qualified her, and which in the historic ages she took in spite of those natural obstacles which the enterprise of her sons has now overcome."[509] In *The Mont Cenis Tunnel*, it is also pointed out how the tunnel makes it possible "to supersede those steep and circuitous mountain roads (…) by a new mode of entering Italy from the North which might be practicable at all seasons."[510] This, it is assumed, "must be useful to Italy."[511] In a similar manner, the *Illustrated London News* refers to the Count of Cavour (who was the first Prime Minister of the United Kingdom of Italy) and Sir James Hudson (British ambassador to Turin in the mid-nineteenth century), both of whom were convinced that "the project of a railway tunnel through the Alpine barrier which shuts out Italy from the rest of the Continent [was] the surest way to solve the problem of Italian commercial and industrial regeneration."[512]

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[505] "The Mont Cenis Tunnel," *The Scotsman*, 20 September 1871, 3.
[506] *The Mont Cenis Tunnel*, vii.
[507] "In the Midst of a Desolating War," *The Times*, 26 December 1870, 7.
[508] Ibid.
[509] "The Mont Cenis Tunnel," *The Scotsman*, 20 September 1871, 3.
[510] *The Mont Cenis Tunnel*, viii.
[511] Ibid.
[512] "The New Overland Route and the Mont Cenis Railway," *Illustrated London News*, 23 January 1869, 94.

The *Times*, moreover, is convinced that Spain had previously profited from intensified French influence made possible by means of a new railway line. Contemplating the future effects of the Mont Cenis Tunnel on Italy, the readers' attention is therefore first of all drawn to the positive effects French impact has had on Spain:

> French genius and energy have been the means of awakening [the Spanish] from the torpor which has lain on them for generations. Spain is reviving intellectually under that influence, and her material prosperity has advanced wonderfully since her capital and the greater part of her large towns have been brought into easy communication with Paris.[513]

Accordingly, it is therefore assumed that the Mont Cenis Tunnel, facilitating access to the Italian peninsula, will initiate a similar process and that therefore, "Italy, long divided, and with a population almost equally unprogressive, [will be] similarly transformed."[514] These passages make clear that the Mont Cenis Tunnel is ascribed an enormous transformative power: once Italy's geographic isolation is overcome – which, according to the passages cited, was the only reason for the country's backwardness – by means of the railway tunnel, Italy will prosper.

In the passages cited previously, the popular technologically determinist belief that technological developments and the improvement of humankind's living condition are inextricably linked, is reflected. There appears to be an overwhelming consensus that modern transport and communication technologies will result in improvements in the various spheres of human activity.

In contrast to such favourable comments, however, there are also critical voices, which do not only question the positive effects such modern channels of transport and communication would seemingly inevitably bring about, but also indicate that the nineteenth century was perhaps less progressive than modern technological achievements suggest. The *Manchester Guardian* points out that

> [i]n speculative philosophy, in poetry, in the arts of sculpture and painting, in the perfection and niceties of language, we can scarcely be said to have made any advance for upwards of 2,000 years. Probably no instrument of thought and expression has been or ever will be more perfect than Greek or Sanscrit: no poet will surpass Homer or Sophocles; no thinker dive deeper than Plato or Phythagoras; no sculptor produce more glorious marble conceptions than Phidias or Praxiteles. It may well be that David, and Confucius, and Pericles were clothed as richly and comfortably as George III. or Louis XVIII. and far more becomingly. There is every reason to believe that the dwellings of the rich and great among the Romans, Greeks, and Babylonians were as luxurious and

[513] "In the Midst of a Desolating War," *The Times*, 26 December 1870, 7.
[514] Ibid.

> well appointed as our own, as well as incomparably more gorgeous and enduring. It is certain that the palaces belonging to the nobles and monarchs of the Middle Ages – to say nothing of abbeys, minsters, and temples – were in nearly all respect equal to those erected in the present day, and in some important points far superior.[515]

Admittedly, it is subsequently noted that in "many other equally significant and valuable particulars (…) the progress of the world [has] been not only concentrated into these latter days, but singularly spasmodic in its previous march;"[516] nonetheless, the passage quoted before corresponds to Coleridge' critique, according to which technological developments should not be the only gauge by which progress is measured.

With reference to the Suez Canal, the *Scotsman* points out that

> [a] work the same in object, though on a different scale, was executed by the ancients about 2500 years ago, and existed for fifteen centuries. This brings the reflection that, even in things material and mechanical, the progress of modern times and Western countries has not been so enormous, compared with ancient times and with the East, as is perhaps too universally and complacently assumed. Nor is there much comfort in the knowledge that the work of the ancients went to ruin a thousand years ago, apparently through the agency of human violence; for that, like many other things in the history of the East, admonishes us that mankind may retrograde.[517]

In this passage, too, the idea of steady progress and the superiority of the nineteenth-century over previous eras is questioned.

4.2 Playing God? Triumphs over Nature, Christian Beliefs and Human Omnipotence

Along with these statements on the idea of progress and its manifestations in form of transport and communication technologies, the conviction that the subjugation of nature and the conquest of wilderness are fundamental preconditions for this found expression. Nature is frequently described as wild, dangerous and unpredictable. In an account of the laying of the 1858 cable, the *Scotsman* notes that

> [t]he elements were adverse, and every freak of the winds, every lurch of the waves, gave new cause of anxiety; monsters of the deep seemed ready to snap asunder by a flap of fin or tail the slender wire with which man was so strangely invading their haunts.[518]

[515] "Concentrated Progress of the World," *Manchester Guardian*, 5 August 1868, 3.
[516] Ibid.
[517] "Egypt: The Opening of the Great Canal," *The Scotsman*, 12 November 1869, 2.
[518] "The Alleged Antagonism of Science and Romance," *The Scotsman*, 14 August 1858, 2.

The *Illustrated London News* describes the Atlantic Ocean as "awe-inspiring"[519] and considers the Alps to be a "sublime mountain scenery of aerial peaks and precipitous chasms, of roaring torrents and silent upper fields of snow."[520]

By means of scientific methods and technological devices, it is pointed out, this wilderness and the underlying principles could first be explored and understood, and subsequently restricted and harnessed. The *Illustrated London News*, reporting the opening of the Great Exhibition, remarks that in the course of the previous decades, "science [had begun] to feel her strength – to discover new worlds in nature for the exercise of her power and ingenuity."[521] Concerning the laying of the 1866 transatlantic cable, the same magazine depicts scientific exploration and technological innovations as tools at mankind's disposal, by means of which nature is tamed:

> We are dumb with amazement at the extent to which the most secret laws of nature have been made available to man's intelligence for man's progress; and, looking at the mastery which has been obtained within the last half century over her most mysterious and invisible powers, and at the beneficent uses to which they have been made subservient, we are much more disposed to wonder over the past than to be incredulous about the future.[522]

Accordingly, both the construction and launch of the various transport and communication technologies, on the one hand, and the scientific findings informing them, on the other, are considered to be victories gained by mankind and are described correspondingly: in relation to the *Great Eastern*, it is noted that "[t]he very elements and powers of nature seem to have revolted against her only to be conquered and brought into subjection."[523] The laying of the transatlantic cables of 1858 and 1866, respectively, and the Indian submarine cable are referred to as "scientific victory,"[524] "triumph of energy and science,"[525] "scientific and commercial triumph,"[526] "the most marvellous triumph of mind over matter, of man over nature,"[527] "the most wonderful achievement of this victorious century"[528] and "one of the greatest of man's triumphs

[519] "The Anglo-American Telegraph," *Illustrated London News*, 4 August 1866, 101.
[520] "The New Overland Route and the Railway Tunnel of the Alps," *Illustrated London News*, 13 February 1869, 166.
[521] "The Great Exhibition," *Illustrated London News*, 3 May 1851, 343.
[522] "The Anglo-American Telegraph," *Illustrated London News*, 4 August 1866, 101.
[523] "The 'Great Eastern'," *Illustrated London News*, 17 September 1859, 263.
[524] "The Whole Civilised World," *Illustrated London News*, 7 August 1858, 124.
[525] "The Enthusiastic Manner," *Illustrated London News*, 28 August 1858, 193.
[526] "The Atlantic Cable," *Lloyd's Weekly Newspaper*, 5 August 1866, 1.
[527] "The Atlantic Telegraph," *Lloyd's Weekly Newspaper*, 7 October 1866, 2.
[528] "The Success of the Atlantic Cable," *The Times*, 30 July 1866, 8.

over the forces of nature."[529] The procedure of laying out the 1866 cable is accordingly styled a "battle (…) fairly won."[530] The *Liverpool Mercury* considers it "refreshing to turn from the turmoil of European wars and domestic strife to the calm and majestic triumphs which science achieves in the common interest of humanity and civilisation."[531] Around two months later, it is pointed out that

> [t]he completion of the Atlantic Telegraph will ever be remembered as one of the very greatest triumphs that scientific enterprise has achieved even in an age fruitful beyond all example in victories of mind over material nature. The difficulties to be surmounted, if not absolutely new in kind, were altogether unprecedented in magnitude, and might well have seemed hopelessly insuperable to the most daring of scientific innovators. [532]

It is further emphasized that

> there is a two-fold victory to celebrate. The successful laying down of the new cable is even a less marvellous exploit than the second and more difficult half of the enterprise (…). The picking up of the old line from the depths of the ocean, whence no treasure-trove was ever rescued before, and the completion of the work which was last year arrested by a seemingly irretrievable casualty, will always rank among the most astonishing triumphs of human skill and perseverance under difficulties.[533]

What is particularly important is that the laying of the transatlantic cable is a "*pacific* victory over material obstacles"[534] [my italics] and thus stands in stark contrast to other contemporary events:

> And there is no drawback to the satisfaction with which we celebrate such conquests as these. When Berlin welcomed home the victors of Sadowa, the festivities of jubilant patriotism must have been a little marred by the thought of devastated fields and ruined cities, and the terrible lists of killed and wounded, and the widows and orphans to whom public rejoicing means private mourning. But the triumphs of science over nature are pure and unmixed. There was no skeleton at Monday's banquet. In this campaign the gain of one is the gain of all, and the victors are free to enjoy their victory without any disturbing thoughts of the price which humanity has paid for it. [535]

In a similar manner as the various telegraph cables, the Mont Cenis Tunnel is referred to as an "abiding conquest of human intelligence and energy over the stupendous natural obstacles," [536] "great victory (…) gained by science," [537] "triumph of science over

[529] "The British Indian Submarine Telegraph," *The Times*, 9 November 1869, 5.
[530] "The Anglo-American Telegraph," *Illustrated London News*, 4 August 1866, 102.
[531] "The Atlantic Telegraph," *Liverpool Mercury*, 30 July 1866, 6.
[532] "The Atlantic Telegraph," *Liverpool Mercury*, 3 October 1866, 6.
[533] Ibid.
[534] Ibid.
[535] Ibid.
[536] "The New Overland Route and the Alpine Railway Tunnel," *Illustrated London News*, 6 February 1869, 133.
[537] *The Mont Cenis Tunnel*, vi.

difficulties"[538] and "even a subjugation of the elements, inasmuch as the waters of the Alps were utilized for the purpose of compressing the air, and the air thus compressed was made available for blasting the rock."[539] The role of science and technology as tools for the subjugation of nature and the animal world is also illustrated in the following master-servant-analogy. Reporting the exhibits Britain presents at the Crystal Palace, it is remarked "how, with steam as her handmaid, she (…) navigates the ocean, and outruns the swiftest animals in her course."[540] Besides, the Great Exhibition is depicted as display of "triumphs of human skill."[541]

Furthermore, in this context it becomes apparent how attempts were made to reconcile contemporary scientific insights with established Christian belief. This was done by pointing out that these accomplishments or 'triumphs', to use the language of the time, were evidence of mankind fulfilling its divine predestination. The *Times*, with regard to potential critics of the *Great Eastern*, who might argue "that the sea was a providential appointment" and that "[man] had no right to unite what GOD [*sic*] had separated, and connect land with land when the Divine power had inserted water between,"[542] accordingly notes that

> [w]e have long seen the weakness of this argument, and arrived at a much better doctrine of final causes than this. But, if any one wants to see a good finishing blow given to the Horatian argument (…) he may see it given by the Great Eastern. That mighty fabric indeed does not talk, but it acts, - its act being a months' voyage to India or to Australia. That act, while it is a speechless, is at the same time the most powerful answer, that the religious scruples (…) could receive. A reflecting mind will see in such a voyage a much more natural, proper, wise, and obedient fulfillment of the designs of PROVIDENCE [*sic*] than any timid self-confinement and servile deference to a barrier of nature would have been. It will appear that the sea was made to alternate with the dry land, not that continents might be disconnected, but that man should have the opportunity of exerting his skill and invention in connecting them.[543]

Concerning the laying of the transatlantic cable of 1866, the *Times* takes a similar line and directly refers to Genesis 1:28,[544] declaring that the transatlantic cable "cannot fail to lead to a great advance in the development of human dominion over nature. It may be

[538] Ibid., viii.
[539] Ibid., viii f.
[540] "The Great Exhibition," *The Times*, 15 May 1851, 5.
[541] "The Great Exhibition," *The Times*, 13 October 1851, 5.
[542] "Among the Passions," *The Times*, 18 April 1857, 8.
[543] Ibid.
[544] "And God blessed them, and God said unto them, Be fruitful and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth." Genesis 1:28 (King James Version).

expected to prove an important step in that work of 'replenishing the earth and subduing it' which remains, as it has always been, the great task of mankind."[545]

Similarly, in *Poles, Wires, and Cables*, a book-length publication in which the author engages with what he himself calls the 'Christian Aspects' of electric telegraphy, the electric telegraph is described as a "special means which, under Providence, is afforded us by science."[546]

This emphasis on divine providence, due to which man was enabled, if not even obliged, to subdue nature, however, was only one way to intertwine the seemingly contradictory tendencies; moreover, Christian world views were also embraced by highlighting the role God was assumed to have played in the development and implementation of these technologies. In the *Visitor's Guide to the Great Eastern*, the fact that the construction of such a ship could not be accomplished by means of the knowledge and capability of a single person is alluded to repeatedly; instead, as is pointed out several times, a work of such magnitude rests upon the research that has previously been carried out by a multitude of scientists, and the joint expertise of numerous engineers. Accordingly, it is argued that "it seems to be a law of God's Providence that no great invention is to be the work of one man." Contemplating the reasons for this, the readers are told that

> whether He would have us learn how essentially gregarious he has made us, – how absolutely dependant every one upon every other for whatever we enjoy, or whether He does not think it good that any one man should appropriate the whole merit, lest in our gratitude to him we forget the real Giver of the blessing in question, – Him who giveth us power to get wealth.[547]

The *Illustrated London News*, relating to the laying of the transatlantic cable of 1866, emphasizes that

> [g]ratitude quickly follows astonishment. We are thankful to the Supreme for having kept under control countless possibilities latent in that vast region much of which lies beyond the ken, and all of which is beyond the dominion of human science, whereby, at any moment, the enterprise might have been baffled.[548]

In a similar manner, *Lloyds Weekly Newspaper*, reporting the inauguration of the Mont Cenis Tunnel, points to the speech held by the French minister, in which he had

[545] "The Success of the Atlantic Cable," *The Times*, 30 July 1866, 8.
[546] '*Poles, Wires, and Cables;' or, Electric Telegraphs: Their Past and Their Future. Their Commercial Advantages and Christian Aspects* (London: E.J. Francis, [1869]), 43.
[547] Jackson, *Visitor's Guide to the Great Eastern*, 12.
[548] "The Anglo-American Telegraph," *Illustrated London News*, 4 August 1866, 101.

declared that the "success of the work was due in the first degree to God, who inspired men with the thoughts out of which such undertakings sprung."[549]

Along with passages seeking to establish a relationship between traditional Christian beliefs and recent technological developments, there are those where scientific and technological innovations are depicted as proof of human omnipotence. In this respect, the following extract from the *Scotsman* is particularly interesting. With regard to the Suez Canal, it is declared that

> [in] this enterprise, sea has been made land – and land has been made sea. The arrangements of nature have been reversed; man has said to the sea, Thus far shalt thou come, and thus far shalt thou go back – and for once he has been obeyed.[550]

This is nothing less than a celebration of the creative power of man, who, by means of his scientific and technological expertise, is able to modify landscape and shape it in a seemingly arbitrary manner: sea can be made land and *vice versa*. The subsequent phrase "Thus far shalt thou come", in turn, is a reference to the Book of Job: Job was a righteous and affluent man, until he lost all his possessions, his children and his physical health. Contrary to his wife's request, however, Job neither denounced God nor accused Him of injustice, but merely asked for an explanation. Finally, God spoke to Job and declared that Creation was a divine prerogative. Chapter 38, vs. 8 – 11 read as follows:

> Or who shut in the sea with doors when it burst out from the womb, when I made clouds its garment and thick darkness its swaddling band, and prescribed limits for it and set bars and doors, and said, 'Thus far shall you come, and no farther, and here shall your proud waves be stayed.'[551]

On the one hand, the Bible passage referred to in the *Scotsman* is yet another indication of the extent to which the Scripture was common cultural currency to the Victorians.[552] Here, however, it is not only man's special role in Creation that is stressed in order to justify the subordination of nature; rather, by means of this reference to the Book of Job, man himself is ascribed a godlike status on the basis of his ability to transform his environment by means of technology. The uncovering of nature's 'secrets' and the expertise to conceive, build, and operate a technological work the size of the Suez Canal is presented as the acquisition of seemingly unlimited power over nature.

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[549] "Opening of the Mont Cenis Railway," *Lloyd's Weekly Newspaper*, 24 September 1871, 2.
[550] "The Suez Canal," *The Scotsman*, 6 December 1869, 3.
[551] Job 38:8-11 (English Standard Version Bible).
[552] Cf. Timothy T. Larsen, "Literacy and Biblical Knowledge: The Victorian Age and Our Own," *Journal of the Evangelical Theological Society* 52, no. 3 (2009):519-525.

In a similar manner, the *Illustrated London News*, reporting the preparations for the *Great Eastern'*s maiden voyage and referring to the ship's enormous size, remarks that "it was as if [the spectators] were looking for an illustration of the miracle to be performed by the man with a mustard-seed of faith, that he should say unto the mountain 'Be removed into the sea,' and that it should be so."[553] Man's ability to exert control over a ship the size of the Great Eastern is emphasized by reference to a passage from the Bible (in this case, Matthew 17:20).[554]

Even though there is no reference to the subjugation of nature, a similar text passage in the *Visitor's Guide to the Great Eastern* is worthy of mention. Here – in contrast to the passage from the book cited earlier, in which the role of divine providence for the development of the ship has been pointed out – the godlike status man achieves by means of technology is illustrated: "[g]azing on the colossal monuments of skill which meet the eye in every direction (…), we are almost led to think 'the gods are come down to us in the likeness of men'." Furthermore, it is claimed that "[t]his is an age of admiration, when Gods walk the earth, or beings more than men."[555]

Such notions of the subordination of nature and the primacy of science and technology do not always go unchallenged. After the explosions aboard the *Great Eastern*, the *Illustrated London News* remarks that "the docile and obedient Steam – an admirable slave, but a fearful master – was outraged in the laws of its existence by (…) neglect or ignorance."[556] Reporting the "trial trip of the Great Eastern"[557] a few weeks later, the same magazine notices that despite its enormous size, the ship is, after all, subject to the whims of the sea:

> Those persons who have indulged the notion that the vessel will be as free from pitching and rolling as a railway upon the solid ground have somewhat underrated the power of a vast body of water in motion. If the ship were ten times her present size, so long as she floats, she must obey the rise and fall of the water. She may defy the smaller ripples upon the surface which may toss a wherry; but there are 'Great Easterns' among the waters of the Channel and the Atlantic which will compel the biggest ship to dip her head and own their superior power.[558]

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[553] "The Departure of the 'Great Eastern'," *Illustrated London News*, 10 September 1859, 241.
[554] "He said to them, 'Because of your little faith. For truly, I say to you, if you have faith like a grain of mustard seed, you will say to this mountain, 'Move from here to there,' and it will move, and nothing will be impossible for you.'" Matthew 17:20 (English Standard Version Bible).
[555] Jackson, *Visitor's Guide to the Great Eastern*, 4.
[556] "The 'Great Eastern'," *Illustrated London News*, 17 September 1859, 263.
[557] "The Trial Trip of the Great Eastern," *Illustrated London News*, 15 October 1859, 377.
[558] Ibid.

Similarly, an article on the Mont Cenis Tunnel published in the *Scotsman* questions the seeming omnipotence and permanence of technology: It is assumed that the tunnel is going to be very useful for the time being and in the near future, but certainly not forever: "Months, nay years, may roll on; the East may for all our time communicate with the West through the tunnel;"[559] subsequently, the readers are warned for potential 'retaliation' that will take place at some undetermined point in the future:

> [B]ut some day or other an avalanche will laugh at all precautions, a slip of rock will destroy the results of all this great labour for a time, and human beings and rolling stock will be hurled thousands of feet into ravines to see which is to become dizzy.[560]

Despite such objections, enthusiasm for the technologies in question predominates the items under consideration. Accordingly, aspects of the technological sublime are touched upon. Concerning the Great Exhibition, the *Times* asserts that "[it] was natural that such an event should be regarded by all who witnessed it with no ordinary degree of emotion."[561] The *Great Eastern* is described as an "epic of iron, a sublime embodiment of the might and majesty of England."[562] Similarly, the *Illustrated London News* notes that "[t]here is an epic sublimity in all that relates to her,"[563] and further remarks that spectators on shore are feeling "a throbbing and an anxious interest in the career of the vessel."[564] In relation to the soon to be opened Suez Canal, the *Illustrated London News* claims in March 1869 that

> [i]t is impossible to contemplate this magnificent achievement without emotion. Not only does it excite our sense of admiration, but it suggests thoughts and stirs feelings, and awakens hopes, all of which carry us into the far future, and connect themselves with the progressive development of the human race.[565]

In these passages, it is first and foremost positive feelings of hope and admiration that are being evoked. The *Visitor's Guide to the Great Eastern,* by contrast, also alludes to the way in which technology could be intimidating:

> You are struck with amazement when, for the first time, you obtain a view of it; it is impossible to measure the astonishment that overwhelms you as you look upon its immensity. Gazing upon this unrivalled triumph of science, one feels as by a magic hand rivetted and enchained to the spot, - the heart beats, the bosom heaves, a thrilling sensation steals over the frame; her enormous proportions gradually fill the eye, which brightens with excitement, and we feel an overwhelming sense of man's corporeal insignificancy, mingled with a proud consciousness of his mental powers, such as we

[559] "The Mont Cenis Tunnel," *The Scotsman*, 20 September 1871, 3.
[560] Ibid.
[561] "The Great Exhibition," *The Times*, 13 October 1851, 5.
[562] *Great Eastern Steam Ship*, 4.
[563] "The 'Great Eastern'," *Illustrated London News*, 17 September 1859, 263.
[564] "The Departure of the 'Great Eastern'," *Illustrated London News*, 10 September 1859, 241.
[565] "The Suez Canal," *Illustrated London News*, 27 March 1869, 301.

> experienced when we for the first time stood and wonderingly looked upon that magnificent structure – The Britannia Tubular Bridge which spans the Mighty Straits. Whatever different tastes may have prevailed in determining the character of this metallic monster, all writers have been unanimous in their admiration.[566]

Again, the first feelings being described are ones of amazement, astonishment and excitement, yet it is also pointed out that the *Great Eastern*, despite being a "human enterprise,"[567] illustrates man's "corporeal insignificancy."[568] Setting foot on the ship, the feelings of fear and intimidation are, according to the article, intensified, as that is when one becomes aware of its enormous dimensions:

> The bulwarks rise breast high all round the ship, and the skylights enable the spectator to look down into the engine-room, and see the greatest mechanical power in the world in easy experimental motion. Looking down her shafts you are looking as it were down a mine. The workmen engaged at the furnaces below are dwarfed to the size of children. The engines (…) seem as if they could never be set in motion, or if set in motion, like Frankenstein's Demon could never be stopped.[569]

In comparison to the size and performance of the *Great Eastern*, man is depicted as insignificant and childlike. Moreover, the allusion to Frankenstein's monster and the apprehension that once started, the ship cannot be brought under control again, indicate that contemporaries felt there was some threat emanating from the ship.

Subsequently, however, it is pointed out that no such threat emanates from the *Great Eastern*, for "so finely wrought and balanced are [the engines] that the machinery works with the same ease and precision, and can be moved or stopped with the same facility, as that of the smallest of our river boats."[570] Despite its frightening dimensions, the ship is, after all, subject to human control.

4.3 Chapter Summary

This chapter set out to examine the extent to which nineteenth-century transport and communication technologies were considered to epitomize progress and human subjugation of nature. It also aimed at pointing up the ways in which these technologies were embedded in historical, social and cultural contexts and the reasons for this.

[566] Jackson, *Visitor's Guide to the Great Eastern*, 10.
[567] Ibid.
[568] Ibid.
[569] Ibid., 25f.
[570] Ibid., 26.

Generally speaking, in line with the optimistic view that science and technology would improve humankind's living conditions, contemporary transport and communication technologies were mostly evaluated positively. They were described as symbols of the progressiveness of the nineteenth century, on the one hand, and were considered to be an epitome of human power over nature and, accordingly, a paradigm of man's special position within divine creation, on the other. For this purpose, and in order to acquaint the public with them, they were juxtaposed and compared to a wide spectrum of references, including, among other things, biblical imagery, achievements of the advanced civilizations of ancient Egypt and Greece, or the expeditions of Columbus and other explorers. In doing so, it was possible to represent them as conclusion of long-lasting processes of development and point up their specific superiority at the same time.

Despite this seemingly widespread consensus, though, there are critical voices to be found very occasionally which draw attention to the fact that technological developments should not be the only benchmark to judge society and call into question the seeming omnipotence.

In the following chapter, I will look into the notion of the annihilation of time and space, which I argue is to be seen in the context of the alleged human omnipotence.

"Space-time was like butter, she thought, driving fast,
and this car the warm knife slicing through it."[571]

5. The Annihilation of Time and Space? Changing Perceptions of Time, Space and Distance

In 2009, the Norwegian shipping company *Colorline* introduced what it called superspeed ferry boats shuttling between Denmark and Norway; these ships being faster than ordinary ferry boats, the duration of the passage was reduced drastically. The Norwegian tourist information Visit Norway therefore advertised that "Norway is moving closer."[572]

In January 2012, the German daily newspaper *taz* published an article on the construction of a high-speed railway line connecting London with the north of the country which had just been approved by the British government. The article was titled "Leeds is moving closer to Paris."[573]

And with regard to the French high-speed trains TGV, *Eurail*, the company selling European rail tickets, remarked on its homepage that "[t]he Northern high-speed line has brought Northern France and Europe closer to the rest of France."[574]

All of these statements allude to the degree to which in the early twenty-first century, our perceptions of space and distance are informed and shaped by means of the respective media and channels of transportation at hand, be it a ferryboat, a train, or a car. They all suggest that, with the right means of travel at one's disposal, faraway places move closer, distances shrink and spaces can thus be remodelled according to our needs and desires.

It is hardly surprising that this is not solely a twenty-first century phenomenon: As has been pointed out in the introductory chapter, the ways in which nineteenth-century technologies "created distinctive new modes of thinking about and experiencing time

[571] Salman Rushdie, *Shalimar the Clown* (London: Vintage, 2006), 20.
[572] "Visit Norway Transport," last viewed 5 March 2012. Site now discontinued. http://www.visitnorway.com/de/Transport/Fahren-und-Schiffe/Color-Line/.
[573] Ralf Sotscheck, "Leeds rückt näher an Paris," *taz*, January 11, 2012, last viewed 6 December 2013. http://www.taz.de/Schnellzug-Projekt-in-England/!85411/.
[574] "Eurail," last viewed 6 December 2013. http://www.eurail.com/planning/trains-and-ferries/high-speed-trains/tgv.

and space"[575] has received persistent scholarly attention. One of these new modes of thinking, summarized under the slogan 'annihilation of time and space',[576] can be attributed to the newly introduced transport and communication technologies. The notion that one could annihilate either time or space is nonsensical[577] (particularly given the fact that the worldwide telegraph network necessitated the establishment of standardized time zones on a global level),[578] but the idea nonetheless vividly illustrates the fact that, with improving means of transport and communication at hand (in other words, media which are either faster or more reliable than the previous ones, or of an entirely different quality), the significance of geographic space and distance as a variable within the communication function previously mentioned decreases.

In this chapter I will therefore examine the interconnection between nineteenth-century transport and communication technologies, on the one hand, and contemporaries' perceptions of time, space and distance, and their supposed annihilation, on the other. I will illustrate that the catchphrase of the annihilation of time and space can be highly misleading, in the sense that it implies a naive and simplistic way of thinking about this relation. I maintain it can best be understood if regarded as a hyperbole that tells us more about contemporaries' determination to subjugate nature and their "almost unlimited will to power and transcendence over [her] limitations,"[579] than about an incomprehension of changing spatiotemporal arrangements on their part. A critical reading of relevant reporting will demonstrate that new transport and communication technologies did indeed influence contemporaries' perceptions of time and space; it will also be seen, however, that there was a deeper understanding of such phenomena, which went beyond the claim that time and space had been abolished and can be said to anticipate present-day analyses.

Firstly, however, it is necessary to appraise various conceptions of space and distance, respectively, and to look at the interplay between technologies of transport and communication, and perceptions of time, space and distance.

[575] Kern, *Culture of Time and Space*, 1.
[576] Cf. Iwan Rhys Morus, "'The Nervous System of Britain': Space, Time and the Electric Telegraph in the Victorian Age," *The British Journal for the History of Science* 33, no. 4 (2000):456.
[577] Cf. Roland Wenzlhuemer, "Globalization, Communication, and the Concept of Space in Global History," 30f.
[578] Cf. ibid., 31.
[579] Hård and Jamison, *Hubris and Hybrids*, 2.

5.1 Of Coexisting Spaces and Distance Paradoxes

In everyday usage, space is usually considered a given fact, a datum one takes for granted and thus hardly ever examines or questions. Similarly, as the idea of space used to be routinely ascribed to the discipline of geography, on the one hand, and was deemed immobile, if not 'dead', and thus hardly of any interest anyway,[580] on the other, most social sciences and humanities have for long neglected space as an analytical category (a circumstance usually referred to as 'space blindness'[581]).

In recent times, this has dramatically changed: in line with Foucault's assumption that the present epoch may "above all [be] the epoch of space,"[582] space-related questions are now attracting attention in a multitude of social sciences and humanities disciplines,[583] a phenomenon contained within the expression 'spatial turn'.[584] The emergence of mobile communication devices and the spread of the internet from the mid-1990s onwards, both making *place*, to borrow Giddens' words, "increasingly phantasmagoric,"[585] have certainly promoted scholarly interest in space-related questions: in the age of mobile telephony, for instance, it is no longer necessary to know a person's whereabouts in order to reach him or her on the phone.[586] Social networking sites make it possible to share thoughts, pictures and other content with family and friends (almost) irrespective of their location. And programs such as Google Earth with its various functions (Google Street View, for instance), enable users to 'look around' and familiarize themselves with places at the other end of the world.

Accordingly, Stanley Brunn and Thomas Leinbach point out that someone's actual geographic location is no longer of primary importance; it is the connectivity or the

[580] Cf. Martina Löw, *Raumsoziologie* (Frankfurt am Main: Suhrkamp, 2001), 65. What is more, in German-speaking areas, space ('Raum') was a term connected to Nazi ideology and was therefore for a long time avoided; cf. Werner Köster, *Die Rede über den 'Raum'. Zur semantischen Karriere eines Deutschen Konzepts* (Heidelberg: Synchron Wissenschaftsverlag der Autoren, 2002).
[581] Cf. Dieter Läpple, "Essay über den Raum: Für ein gesellschaftswissenschaftliches Raumkonzept," in *Stadt und Raum: Soziologische Analysen*, eds. Hartmut Häußermann et alt. (Pfaffenweiler: Centaurus, 1992), 163. My translation; German original: "Raumblindheit."
[582] Michel Foucault, "Of Other Spaces," *Diacritics* 16, no. 1 (1986):22.
[583] For the variety of disciplines engaging in spatial phenomena, see, for instance, Barney Warf and Santa Arias (eds.), *The Spatial Turn. Interdisciplinary Perspectives* (London: Routledge, 2009); Jörg Döring and Tristan Thielmann (eds.), *Spatial Turn. Das Raumparadigma in den Kultur- und Sozialwissenschaften* (Bielefeld: Transcript, 2008).
[584] The notion of a spatial turn has also been subject to criticism, though; cf. Karl Schlögel, *Im Raume lesen wir die Zeit. Über Zivilisationsgeschichte und Geopolitik* (München: Hanser, 2003), 68; and Döring and Thielmann, *Spatial Turn*, 11f.
[585] Anthony Giddens, *The Consequences of Modernity* (Cambridge, Polity Press, 1991), 19.
[586] Cf. Manuel Castells et alt., *Mobile Communication and Society: A Global Perspective* (Cambridge, MA: MIT Press, 2007), 171-174.

relative location – that is, "how far one is from other places in time not in absolute distance, and how much one is connected with other places"[587] – that has become increasingly significant and has inspired researchers from different disciplines to develop new concepts to embrace this. One of these new concepts are Manuel Castells' elaborations on what he calls the *space of flows* and the *space of places*, respectively. The term *space of flows* denotes "the material organization of simultaneous social interaction at a distance by networking communication, with the technological support of telecommunications, interactive communication systems, and fast transportation technologies."[588] This *space of flows* stands in contrast to the so-called *space of places*: the tangible reality surrounding people in their everyday life, which has traditionally been the primary form of spatial organization.[589] What is important to note here is that *space of flows* and *space of places* coexist. Castells emphasizes that the *space of flows* is the dominant spatial logic of information society; he makes also clear, though, that it is not the only one, for "people do still live in *places*."[590] [my italics] This coexistence of spaces must be the starting point if we want to unravel the interconnection between transport and communication technologies and perceptions of space and distance.

To this end, Martina Löw's relational model of space as set out in her monograph on the sociology of space is worthy of attention. It can help us understand that the phenomenon of coexisting spaces is not intrinsically related to the information and communication technologies spreading from the late twentieth century onwards, but has had its historical predecessors (it does not, in fact, have to be related to technologies of transport, communication or information at all). To begin with, Löw points to traditional, historically-rooted models of space.[591] She dwells on the notion of absolute space, that is the idea of space as a container or a box, which can be traced back to ancient Greek philosophy and was drawn upon by Newton in his definition of absolute space as "in its own nature, without relation to anything external, (…) always similar and immovable."[592] Here, space is regarded as a container which encloses objects and *within* which social processes unfold. It is thus considered a stage which would still exist even

[587] Stanley D. Brunn and Thomas R. Leinbach (eds.), introduction to *Collapsing Space and Time. Geographic Aspects of Communications and Information* (London: Harper Collins Academic, 1991), xvii.
[588] Castells et alt., *Mobile Communication and Society*, 171.
[589] Cf. Manuel Castells, *The Rise of the Network Society* (Chichester: Wiley-Blackwell, 2010), 408f.
[590] Ibid., 458.
[591] Cf. Löw, *Raumsoziologie*, 17-34.
[592] Isaac Newton, *Sir Isaac Newton's Mathematical Principles of Natural Philosophy and his System of the World*. 1686. Trans. Andrew Motte, translation revised by Florian Cajori (Berkeley: University of California Press, 1960), 6.

if devoid of any elements within. Our everyday understanding of space is still to a large extent shaped by this idea of absolute space, but, as Löw points out, it is not particularly useful for sociological analysis as space is considered to exist independent of any social activity.[593] Leibniz, on the other hand, opposed this idea of space existing independently of any objects, instead considering it to be "the abstract order of coexisting things."[594] Space is thus understood to be nothing but the *relative* connection between objects.

Contrary to the models of space mentioned above, Löw holds the opinion that, from a sociological point of view, space can neither be reduced to the status of a container nor to a purely relative order of things. In her attempt to develop a new sociological understanding of space, she therefore defines space as "relational ordering of social goods and people."[595] Löw assumes a duality of space, the fundamental idea of which is that space does not simply 'exist', but is constructed by means of actions, which, in turn, are either facilitated or confined by spatial structures. As concerns the construction of space, she distinguishes two procedures: spacing, that is the "situating of social goods and people and/or the positioning of primarily symbolic markings in order to render ensembles of goods and people recognizable as such," and synthesis, which means the creation of connections between such goods and people through "processes of perception, ideation, or recall."[596]

At this point, the coexistence of many different spaces comes into play: if space is defined as the abovementioned relational arrangement of (human) beings and social goods, it is obvious that there cannot only be one space, but that, according to the specific interest, concern or question at hand, a variety of spaces can be constituted. In this context, Wenzlhuemer points out that, while geographic space – a spatial conception in which the relationship among objects is determined by geographic distance only – has traditionally played a most critical role with regard to how we perceive and handle our environment, there have always been complementary concepts, such as (what he refers to as) communication space, transport space or telephone cost space.[597] These spaces have always been informed and shaped by the respective

[593] Cf. Löw, *Raumsoziologie*, 64f.
[594] Roberto Torretti, "Space," in *Routledge Encyclopedia of Philosophy*, ed. Edward Craig (London: Routledge, 1998), 9:61. See also Gottfried Wilhelm Leibniz and Samuel Clarke, *Der Leibniz-Clarke-Briefwechsel*, trans. and ed. Volkmar Schüller (Berlin: Akademie Verlag, 1991), 85.
[595] Martina Löw, "The Constitution of Space. The Structuration of Spaces Through the Simultaneity of Effect and Perception," *European Journal of Social Theory* 11, no. 1 (2008):35.
[596] Löw, "Constitution of Space," 35.
[597] Cf. Wenzlhuemer, "Globalization, Communication and the Concept of Space," 29f.

interests and questions of the observer. In the case of so-called communication space, for instance, the crucial question is how much time is needed in order to communicate between two objects.[598] With present-day information and communication media at hand, geographic distance is no longer of primary explanatory power in this context, and other factors, such as network access, have become more important. Wenzlhuemer therefore recommends we think of space "as a theoretically infinite number of spaces."[599]

As "[o]ur sense of space and time is closely linked to our sense of *distance*, of what is near and what is far away,"[600] [italics in original] it is worthwhile to look at this phenomenon of the plurality of spaces from a slightly different vantage point, namely that of distance. Comparable to the coexistence of a multitude of various spaces, defined by the observer's particular interests, there are also several forms of distance, which are similarly informed by the motives at stake. Dissatisfied with previous definitions of absolute and relative distances, which they consider "ambiguous and imprecise,"[601] Falk and Abler seek to integrate the alterations of distance generated by intercommunications media into geographical thinking. For this purpose, they propose a different terminology and distinguish between three different types of distance: firstly, globe distances, that is "the number of abstract units of length between places;"[602] secondly, effort distances, being the "number of effort units consumed in moving from one place to another,"[603] and thirdly, metaphorical distances, measuring the number of contacts between particular places in a specific period.[604] They assert that

> [v]arious relationships among globe, effort, and metaphorical distances create many *distance paradoxes.* Whereas two places may be in close proximity in globe distance, they may be far apart in terms of effort or metaphorical distances.[605] [italics in original]

A vivid example of this is the city of Berlin during the Cold War, East and West Berlin being very near to one another in terms of globe distance, but much further apart when

[598] Cf. ibid., 27.
[599] Ibid.
[600] Thompson, *Media and Modernity*, 35.
[601] Thomas Falk and Ronald Abler, "Intercommunications, Distance, and Geographical Theory," *Geografiska Annaler, Series B. Human Geography* 62, no. 2 (1980):61; absolute distances used to be defined as "essentially invariant over time", for example the number of miles between two places, whereas relative distances can vary over time, for instance the "number of minutes needed to move between two places;" this, according to Falk and Abler, however, is imprecise, because just as the length of a mile / kilometer, the length of a minute is constant, and it is therefore not evident why it should be referred to in terms of relative distances.
[602] Ibid.
[603] Ibid.
[604] Cf. ibid.
[605] Ibid, 62.

it comes to effort or metaphorical distance.[606] It seems obvious then, that this can also be reversed – places that are comparatively far apart in terms of globe distance can be much closer as regards effort or metaphorical distances (for instance, as pointed to above, if they are sufficiently integrated into transport and communication networks). Another example illustrating the shifting relations between globe and effort distances is the time it takes to travel from the East to the West Coast of the United States of America, depending on what means of travel there are at one's disposal. Whereas one will need around 8 months to cross the continent on horseback, it takes only two and a half days by car and a mere 5 hours by airplane[607] – the globe distance remains the same, yet the effort distance is changing.

One can therefore conclude that not only are our notions of space and distance linked, but also that "our sense of distance is shaped profoundly by the means at our disposal to move through space and time."[608] Falk and Abler assert that indeed all movement technologies, as they call them, in one way or another have an impact on effective distances among places, as they all modify the effort it takes to transfer things, (human) beings and information between these places; communication technologies, however, are considered to be of paramount importance in this context as they "have altered the frictions of distance more radically than any other technology."[609]

At this point, it is therefore worthwhile to have a closer look at the electric telegraph: As described earlier, the electric telegraph and the dematerialization of information flows it brought about confounded the previously valid communication equation to such an extent that geographic distance was no longer the most important variable. Accordingly, with the emergence of electric telegraphy "a new, virtual space in which established distances and limitations of time were suspended [had been created]."[610] So-called global communication space was "*partially* compressed,"[611] [italics in original] whereas the structure of geographic space remained unchanged. Using the example of the development of the global telegraph network throughout the second half of the nineteenth century, it will become clear how this impacted on changing perceptions of

[606] Cf. ibid.
[607] Cf. Löw, *Raumsoziologie*, 69.
[608] Thompson, *Media and Modernity*, 35.
[609] Falk and Abler, "Intercommunications, Distance, and Geographical Theory," 65.
[610] Wenzlhuemer, "Dematerialization of Telecommunication," 347.
[611] Wenzlhuemer, *Connecting the Nineteenth-Century World*, 47.

time, space and distance.[612] Whereas in 1850, "global *communication space* [was] still closely related to geographic space,"[613] [italics in original] by 1870 the situation had changed already. By then the telegraphic connections to both North America and South Asia had been put into place, and as a result communication space between these regions and Europe had been partially compressed, or, to put it differently, effort and metaphorical distance had decreased decisively. Other regions, on the contrary, such as South America and Africa, had not been integrated into the network to the same extent; Despite the fact that their absolute communication times had diminished, neither had communication space been compressed significantly nor had effort or metaphorical distance been reduced decisively. The improvements that had been made were not sufficient to change the structure of communication space or to impact on the relation between globe and effort distance. Again thirty years later, in 1900, with an even more comprehensive network, the antipodes of Australia and New Zealand were integrated to such a degree that, in terms of effort and metaphorical distance, they were closer to London than – strictly geographically-speaking – more proximate places in North America or Europe. Wenzlhuemer consequently concludes that "*communication space* had detached itself almost completely from geographic space."[614] [italics in original] Availing oneself of the electric telegraph for the purpose of long-distance communication, one could now 'skip' geographic space, as Ahrens, referring to the virtual space created by the internet, aptly calls it.[615]

As mentioned, Falk and Abler consider communication technologies to be of paramount importance, but they point out that *all* technologies of movement play a role in this

[612] As often, it must be warned against oversimplified and strictly monocausal explanations, though; In his article "Reflections on Time, Time-Space Compression and Technology in the Nineteenth-Century," Jeremy Stein, for instance, addresses the question to what extent social processes, within which these technologies were embedded, tend to be ignored, and points to the fact that most research in this field is based on the respective society's elite. Consequently, he poses the question if the general public was actually realizing these changes at all, and if so, to what extent. Using the example of the Canadian textile town Cornwall (Ontario) and its gradual integration into the emerging communication and transport networks in the course of the nineteenth century, he highlights that while the effects of transport technologies were "indirectly, if not directly, felt by the majority of Cornwall residents" (by means of improved access to economic goods), in terms of communication technology the time lag between the introduction of such technologies and their extensive diffusion (and thus the usage by the general public) was much bigger; as a result it was primarily the social and economic elite who could benefit from these technologies at that very point in time, whose opinions were "not necessarily shared by other groups in the population;" Jeremy Stein, "Reflections on Time, Time-Space Compression and Technology in the Nineteenth Century," in Jon May and Nigel Thrift (eds.), *TimeSpace. Geographies of Temporality* (London: Routledge, 2001), 113 and 119.

[613] Wenzlhuemer, "Globalization, Communication, and the Concept of Space in Global History," 36.

[614] Ibid., 37.

[615] Cf. Daniela Ahrens, *Grenzen der Enträumlichung. Weltstädte, Cyberspace und transnationale Räume in der globalisierten Moderne* (Opladen: Leske und Budrich, 2001), 15.

context. As regards railways, this is mostly due to their sheer speed. Similar to communication space, transport space had been partially compressed, even if not to the same extent: clearly, there was no equivalent to the dematerialization of information flows, for 'real' people still travelled in 'real' (that is, geographic) space, which could not be 'skipped' by means of transport technologies to the same degree as by electric communication technologies. Nonetheless, the relation between globe, effort and metaphorical distance was transformed. What is more, the speed with which people themselves (rather than messages they sent) travelled on railways allowed for new ways of experiencing the environment and landscapes they were riding through; as a result, they could at least get the impression that the space which used to separate places, had ceased to exist.[616]

In a nutshell, changing perceptions of time, space and distance can be traced to the divergence of various coexisting spaces, shaped and informed by different parameters, and shifting relations between different types of distances. In this context, nineteenth-century transport and communication technologies played a most important role.

What is more, the more pronounced such discrepancies between various spaces and distances turn out, the more challenging it is to accommodate them with previously valid notions. Löw accordingly points to metaphors such as 'data highway' and 'global village', which attempt to reconcile present-day distance paradoxes with familiar spatial concepts.[617] The following analysis of relevant coverage will thus illustrate how contemporaries made sense of and voiced the shifting relations between time and space, which imagery they employed and what role the slogan of the 'annihilation of time and space' played in this context.

[616] Cf. Schivelbusch, *Geschichte der Eisenbahnreise*, 39.
[617] Cf. Löw, *Raumsoziologie*, 95.

5.2 Less Than No Time – Representations of Spatiotemporal Transformations in the Victorian Press

In the course of three weeks towards the end of the year 1869, the *Times* publishes several correlating articles and letters to the editor, all of which address the integration of Australia into the global telegraph network. Starting point of this intensive examination is an article published in late November 1869 – that is three years after the transatlantic submarine cable had become operational, yet still three years before a telegraphic connection to Australia would be established – which first and foremost addresses the potential formation of a remount service between Australia and India. The article dwells on the benefits this would bring to the Indian army, and in this connection points out that "Australia is now, owing to recent exploration and settlement, some 1,800 miles nearer to India than it was ten years ago, and before long the two countries will be in direct telegraphic communication."[618] Two weeks later, the *Times* publishes a letter in which a reader, referring to this article, takes up the subject of the establishment of a telegraphic cable to the Antipodes; he declares that

> [a]mong the many plans submitted to the public for knitting closer the connexion [*sic*] between the Mother Country and the Australian dependencies I know none so likely to accomplish the end as telegraphic communication; for then the misconceptions which distance and time now only exaggerate will be few and far between, and, to use a modern phrase, be preventible. [619]

The reader then contemplates why British emigrants preferred the United States over Australia as a country of settlement. He comes to the conclusion that the reason for this is to be found in the better developed means of communication between Europe and North America, as therefore "the United States, apparently, are close at hand, and Australia, apparently, is far away." [620] He consequently argues that "[t]he great drawback to emigration to Australia and New Zealand has been the idea of distance."[621] Dwelling on the effects the establishment of telegraphic communication with Australia might have, he asserts that

> as soon as (…) the mind of the nation can be brought into frequent contact with their fellow countrymen in the antipodes by reading in the newspapers every morning the telegraphic summary of occurrences in those colonies, this idea of distance will,

[618] "The Remount Service of India," *The Times*, 25 November 1869, 4.
[619] "Telegraphic Communication with Australasia," *The Times*, 9 December 1869, 9.
[620] This appears to be a statement taken from the same letter, however, it is only reprinted in the *Times'* article referring to this letter the day after; "When we Placed Before the Public," *The Times*, 10 December 1869, 7.
[621] "Telegraphic Communication with Australasia," *The Times*, 9 December 1869, 9.

> little by little, melt away until at last a voyage to Australia will be thought as trifling as a trip to the Channel Islands.[622]

He assumes that, as a result, an increasing number of British emigrants would choose Australia rather than the United States as their country of settlement.

The following day, in an editorial addressing precisely this letter, the author agrees with the sender in that the distance between the United States and Great Britain seems to have diminished since the transatlantic submarine cable was established.

> When we placed before the public the Message of President GRANT [*sic*] within a few hours of its delivery, it was a natural reflection that the Old and New Worlds could no longer be regarded as two thousand miles apart, and we have since published a remarkable appeal, based upon impressions exactly similar.[623]

He further remarks that "[a]s things now stand, Australia is, so to speak, like a town beyond reach of railways," (thus illustrating the extent to which by then a place's integration into existing railway infrastructure had become an important gauge) and points to the

> considerable reality about this distinction [between the United States and Australia]. It is one thing to run across the Atlantic, and another to set sail for the Antipodes. One thing is done every week, and in little more than the week; the other still implies a troublesome and protracted voyage. [624]

The author comes back to the sender's argument that "all this is matter less of fact than of impression, and that if we could but report Australian news as we reported the PRESIDENT'S [*sic*] Message one country would soon come to be thought of as near as the other."[625] Here, he particularly emphasizes

> the singular stress laid on the effect of telegraphic communication. The thousands of miles of sea which even by the new routes must still separate England from Australia will (…) disappear altogether as soon as correspondence between the two countries is made a matter of hours and minutes. So forcible will be the impression produced that the Antipodes will seem close at hand, and emigrants will seek the shores of Australia instead of the backwoods of the United States.[626]

In conclusion, he demands to

> [c]all Australia into use, and you will gain a new world. It can be done by the mere machinery of a submarine cable. That line will effectually connect England with the Antipodes, will annihilate distance, and, to crown the whole, will do much to prevent misconception between Great Britain and her Colonies.[627]

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[622] Ibid.
[623] "When we Placed Before the Public," *The Times*, 10 December 1869, 7.
[624] Ibid.
[625] Ibid.
[626] Ibid.
[627] Ibid.

Indeed, in globe distance North America is much closer to Europe than the Antipodes, and, generally speaking, the journey across the Atlantic Ocean is even today far less troublesome and time-consuming than that to Australia and New Zealand. As has been pointed out in the passages above, however, with submarine cables between North America and Europe now being operational, whereas those to Australia had not yet been laid, the North American continent appears to have moved *even* closer. This example therefore aptly illustrates how reduced effort and metaphorical distances impact on the perception of globe distance. At the same time, these passages also illustrate that both reader and author were fully aware of such distance paradoxes brought about by electric telegraphy and contemplated how one could make use of them: as is pointed out, the "*idea* of distance will (…) melt away" [my italics] as soon as submarine cables connecting Australia with the global telegraph network will be laid, making the Antipodes a more attractive destination for emigrants.

Admittedly, the annihilation of distance is made mention of (just as the "thousands of miles of sea" are said to "disappear"). Given the fact that the passages quoted above display a good understanding for distance paradoxes brought about by electric telegraphy, it would seem that the slogan of the annihilation of distance is only drawn upon in order to summarize the previous considerations brought forward by reader and reporter. Here, the use of the term annihilation therefore does not indicate a lack of understanding or insight; instead, it seems to be employed in the same way that today's spatial metaphors (such as that of the global village) are used, that is, in order to make the spatial transformations brought about by transport and communication technologies more easily understandable.

The following text passages similarly suggest that the phrase of the annihilation of time and space does not necessarily imply a lack of understanding concerning spatial transformations, but rather illustrate that it was used as a hyperbole, pinpointing the significance of the various technological achievements. Reporting the arrival of the *Sirius* and the *Great Western* in New York in April 1838, for instance, the *Manchester Guardian* observes that

> [t]he day seems to have been quite a gala to the citizens; and the papers are filled with facts, speculations, and 'guesses,' arising out of the event, which one of them describes as 'The beginning of the new age in steam power – the broad Atlantic bridged at last – annihilation of space and time.'[628]

[628] "The 'Sirius' and 'Great Western' Steamers," *Manchester Guardian*, 23 May 1838, 3.

Similarly, early in 1857, when the first expedition to lay a transatlantic submarine cable slowly took shape, the *Times* enthusiastically asserts that

> it will always be a pleasant thought that we are able to annihilate distance, and make Time, who flies so fast, a dull laggard. That imaginary period, which in our jokes we have styled 'less than no time' will become an actual fact.[629]

With regard to the temporarily working transatlantic cable of 1858, the *Illustrated London News* claims in the aftermath of its inauguration that "thousands of miles are as nothing to its speed, its continuity, and its completeness,"[630] and even publishes a poem on the occasion, the beginning of which reads: "Distance, dim tradition of the past / Worn out idea, too absurd to last / Shall bar no more the enterprise of man, / Nor Time compress his efforts to a span."[631] The *Liverpool Mercury* asserts that by means of the 1858 cable, "[w]e have already annihilated half the distance that severs us from our newest colony beyond the Rocky Mountains."[632]

However, it was not only abstract categories of time and space that were thought of as having been annihilated, but also concrete objects. Once more with regard to the 1858 transatlantic cable, the *Illustrated London News* refers to Louis XIV's comment "the Pyreness are no more" (allegedly made with reference to his wedding to Maria Theresa of Spain[633]) and asserts that

> [i]t was a great, though unfounded, boast of the French Monarch when he said there were no longer any Pyrenees. Greater and better founded will be the boast of Englishmen and Americans that there is no longer an Atlantic.[634]

A decade later, in anticipation of the completion of the Mont Cenis Tunnel, the *Illustrated London News* borrows the same phrase again:

> 'Henceforth, there are no Alps!' may then indeed be said, with reference to the benefits of mutual intercourse between the most enlightened nations of Europe, as a French monarch, who had intrigued for a Spanish succession, is said to have exclaimed, 'Henceforth there are no Pyrenees!'[635]

Two years later, shortly after the Mont Cenis Tunnel has been opened for traffic, the *Times* similarly remarks that it "will actually strike the Alps of the traveller's path."[636] In another article published on the same day, the *Times* – although at first announcing

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[629] "The Atlantic Telegraph," *The Times*, 6 January 1857, 12.
[630] "Our Readers will not Think," *Illustrated London News*, 21 August 1858, 168.
[631] Ibid.
[632] "The Atlantic Telegraph," *Liverpool Mercury*, 10 August 1858, 8.
[633] Cf. J. Nicholas Entrikin and Vincent Berdoulay, "The Pyrenees as Place: Lefebvre as Guide," *Progress in Human Geography* 29, no. 2 (2005):145.
[634] "The Whole Civilised World," *Illustrated London News*, 7 August 1858, 124.
[635] "The New Overland Route and the Alpine Railway Tunnel," *Illustrated London News*, 6 February 1869, 133.
[636] "The Mont Cenis Tunnel," *The Times*, 20 September 1871, 4.

that it was "not quite on a par" with the Suez Canal – eventually declares that it nonetheless "belongs to that heroic class, for it has removed a mountain and brought together two great realms."[637] The *Manchester Guardian*'s special correspondent reporting the opening of the Suez Canal describes how invited guests arrive in Egypt, all of whom are awaiting

> the fulfilment of M. De Lesseps's promise that he will efface Africa from the mariner's map of the world next Tuesday, and make the navigation between Europe and Asia as direct and easy as if the ill-fated continent assigned to the children of Ham had never existed.[638]

Given the fact that the vast majority of these articles were published immediately before or after the inauguration or opening of a particular transport or communication technology, it is hardly surprising that, after years of what occasionally must have appeared to be rather hopeless efforts (the construction of the Suez Canal took ten, that of the Mont Cenis Tunnel 14 years), they were written in an enthusiastic, festive and somewhat complacent tone. What is more, they all suggest that the particular technology at hand would usher in a new era ("the new age in steam power," the "imaginary period" becoming an "actual fact," "the fulfilment of M. De Lesseps's promise"). Viewed from this angle, it appears that the phrase of the annihilation of time and space is resorted to in order to emphasize the radical changes that were expected to accrue from these new technologies and to triumphantly highlight the importance of the respective achievement.

What is more, the fact that not only the annihilation of abstract time and space, but also of mountains, oceans and an entire continent is suggested, is highly interesting. In June 1870, the *Times* remarks in an article on the soon to be built St. Gothard railway that "[g]eographical facts are among the most stubborn in the world."[639] The claim that one had not only managed to *subdue* nature, but was also able to *annihilate* some of these 'most stubborn facts', on the one hand, and the abstract categories of time and space in general, on the other, may therefore be seen as the ultimate reassurance of the power humankind was able to exert in relation to its natural surroundings. This view is further supported by the following passages: reporting the opening of the Great Exhibition, the *Illustrated London News* points out that the "workers of the world [show] each other (..) what ingenious and mighty machinery to defy space and time they can construct, what

[637] "It is Only a Small Proportion," *The Times*, 20 September 1871, 7.
[638] "The Opening of the Suez Canal," *Manchester Guardian*, 24 November 1869, 6.
[639] "The Great Enterprise of a Railway," *The Times*, 15 June 1870, 9.

secrets of nature they discover and turn to account for the service of humanity."[640] Reporting the 1858 cable, the *Liverpool Mercury* describes it as a "magnificent triumph now achieved by science and enterprise over time and space."[641] In its coverage of the following attempt to establish permanent transatlantic telegraphic communication in 1865, the 1858 cable is again referred to as "a victory achieved by human intellect over time and space."[642] Viewed from this angle, statements as the above-quoted ones concerning the annihilation of space and time appear to tell us more about the Victorians' complex relationship to nature and environment, their eagerness to prevail over them and the related fantasies of omnipotence and power mentioned earlier, than about new ways of experiencing time and space.

In contrast to the passages quoted above, though, there is a plethora of articles which, similar to the reporting on Australia's integration into the global telegraph network, illustrate not only how the implementation of these new technologies has impacted on perceptions of distance and space; they also demonstrate to what extent contemporaries were aware of this interconnection and reflected on it. At this point it is worthwhile to return to the gentleman who urgently needed to send a telegram to Calcutta (see page 41f) but had difficulty finding a telegraph office where his request could be fulfilled. In his account of his night-time tour through London, during which he was "sent from pillar to post,"[643] he relates the following incident, taking place at the telegraph office at the City of London:

> I asked [the clerk] the price of a telegram to Calcutta. "Calcutta!" he said, and looked very much as if I had asked to telegraph to Fernando Po. (…) Now, Sir, Calcutta is not an unknown place. I thought it was the capital of British India, and that it was in close and constant communication with the City of London.[644]

As Wenzlhuemer points out, what is striking here is that Fernando Po, an island off the West coast of Africa (today part of Equatorial Guinea and known as Bioko), is as a matter of fact several thousand miles closer to London than Calcutta. What is more, in the past any ship *en route* to British India along the Cape route would pass closely by Fernando Po – clearly, the island was not as far-off as the gentleman implied. Nonetheless, due to the well-developed communication channels between London and

[640] "The Great International Exhibition," Exhibition Supplement, *Illustrated London News*, 10 May 1851, 392.
[641] "The Atlantic Telegraph," *Liverpool Mercury*, 10 August 1858, 8.
[642] "The Atlantic Telegraph," *Liverpool Mercury*, 9 August 1865, 6.
[643] "The Post Office and the Telegraphs," *The Times*, 7 December 1870, 6.
[644] Ibid.

Calcutta and the resulting distance paradoxes (reduced effort and metaphorical distance), he seems to perceive Calcutta as being much closer than the African island.[645]

Already with regard to the introduction of Atlantic steamship services, one can find articles referring to this phenomenon. The *Manchester Guardian,* for instance, declares that

> [t]his great saving of time, amounting on the voyage to America to more than a third, and on that from America to Europe to more than a fourth, cannot fail to produce an immense effect on the intercourse between the two continents, if the experiment should prove profitable, and regular lines of steam packets should be established. For all purposes of business and communication, the two countries will be brought more than 1,000 miles nearer to each other than they have ever yet been, and the utmost degree of regularity will be produced in the intercourse.[646]

This is interesting in many respects: firstly, the distance between the two continents is considered to have shrunk by 1,000 miles only for "all purposes of business and communication;" secondly, it is indicated that it could be further reduced in the future ("as they have ever *yet* been"); and thirdly, it also touches upon the fact that it is not only the alleged shortening of the distance between the two continents, but also the regularity and reliability steamships would introduce that would play a role in this context. Similarly, prior to the *Great Western*'s Atlantic passage, the *Scotsman* also points out that "when it does succeed, we may fairly say that America, morally speaking, has been brought two times nearer to Europe than it is at present, and four times nearer than it was thirty years ago, before the sailing packets were established."[647] In the autumn of 1839, the *Scotsman* reprints an article from the *New York Herald* in which it is declared that "[t]he whole world will, in a short time, be brought within the compass of a few thousand miles, figuratively speaking."[648] Rather than resorting to the phrase of the *annihilation* of time, space and distance, all of these samples depict how distances seemed to *shrink* when new vehicles of transport were introduced. They also illustrate how contemporaries verbalized what Falk and Abler refer to as distance paradoxes by means of adverbials ("for all purposes of business and communication"; "morally speaking"; "figuratively speaking") and how reductions in effort or metaphorical distance were thus 'translated' to globe distance. These passages therefore illustrate that contemporaries had a good understanding of the interplay between the vehicles at one's disposal and their impact on perceptions of distance. This becomes particularly obvious

[645] Cf. Wenzlhuemer, *Connecting the Nineteenth-Century World,* 99.
[646] "Steam Navigation Across the Atlantic," *Manchester Guardian,* 23 May 1838, 3.
[647] "Steam Navigation Across the Atlantic," *The Scotsman,* 11 April 1838, 3.
[648] "Magnificent Plans of Steam Navigation," *The Scotsman,* 16 October 1839, 4.

in the *Scotsman*'s reference to the introduction of sailing packets in the early nineteenth century and the *gradual* reduction of distance between Europe and America.

As has been pointed out before, Falk and Abler consider telecommunication technologies particularly important in this context. It is therefore hardly surprising that it is in the reporting on the various cable ventures carried out in the 1850s and 1860s changing perceptions of time, space and distance surface most frequently. With regard to the 1858 transatlantic cable, the *Illustrated London News* remarks that "New Orleans will be brought as near to London as to its own suburbs, or as it already is to Charleston, or any other town and city in the United States or Canada."[649] Further it is pointed out that "[Europe and America] are practically as near as next-door neighbours;" but, interestingly enough, though, it is pointed out that this is only valid in terms of "any peaceful purpose. For fighting they are as far off as ever."[650] (see also chapter 6) A few months after the 1858 transatlantic cable had ceased functioning, *Lloyd's Weekly Newspaper* notes that the cable "[had drawn] London within an hour's call of New York."[651]

As regards the transatlantic cable of 1866, the *Times* declares a few days before it was finally completed that "England and the United States (…) are now, for some of the most important purposes of intelligent intercourse, as closely connected as England and France" and draws the conclusion that "[f]or the purposes of mutual intercourse the whole world is fast becoming one vast city. It was built on two sides of a deep river, but these are now united, and the city is one."[652] The *Illustrated London News* in this context points out that the transatlantic cable is "sufficient to neutralise, to a very comforting extent, the sense of distance."[653] Interestingly, it is the *sense* of distance (rather than distance itself) that is thought of as being affected; moreover, it is described as being reduced "to a very comforting extent" only, instead of being annihilated. In a similar manner, the *Illustrated London News* remarks a few years later in the context of the inauguration of the Suez Canal that "[t]he steam-engine and the electric telegraph are yearly shortening the distance between the mother country and the colonies, scattered though they be."[654] Again, the distance between Britain and her overseas

[649] "The Whole Civilised World," *Illustrated London News*, 7 August 1858, 124.
[650] Ibid.
[651] "The Old Year and the New," *Lloyd's Weekly Newspaper*, 2 January 1859, 6.
[652] "The Success of the Atlantic Cable," *The Times*, 30 July 1866, 8.
[653] "The Anglo-American Telegraph," *Illustrated London News*, 4 August 1866, 102.
[654] "Our Colonial Empire," *Illustrated London News*, 20 March 1869, 278.

possessions is referred to as being shortened by means of electric telegraphy and steam-powered media of transportation, rather than being annihilated. In these articles and commentaries on the various transatlantic cables, reductions in effort and metaphorical distances are again described as alterations in globe distances, yet one can again find specifying phrases, such as "for the purpose of mutual intercourse", that illustrate contemporaries were aware of what Falk and Abler call distance paradoxes.

These passages therefore aptly illustrate how, with expanding transport and communication infrastructure, certain places in North America are described as if they have moved closer in geographic space. What is more, in order to illustrate this, these articles draw on the metaphor of a city and urban living together (vast city, suburbs, neighbours) and, in so doing, would seem to anticipate the imagery of the global village.

The effects telegraphic communication between Britain and India would have were also contemplated. Already in 1851, the *Illustrated London News* points out that "[r]ailroads have commenced there, and before long a double railway route through Europe, with the electric telegraph, will make Calcutta nearer to us in time than Berlin was a century ago."[655] Again, a faraway place, in this case the capital of British India, is described as moving closer with the introduction of new transport and communication technologies, but "in time" only. Drawing a comparison between well-integrated cities in North America and the Indian subcontinent prior to the laying of the British submarine telegraph cable, the following passage further illustrates the extent to which integration into transport and communication infrastructure, specifically the telegraph network, could impact on perceptions of distance. With regard to the soon-to-be laid telegraph cable, it is asserted that "[t]he 3600 miles of cable which will be laid by [the Great Eastern] and her consorts in the Red and Indian Seas (…) will by April next bring Bombay as close to our doors as New York and Philadelphia now are."[656] Taking into consideration that the linear distance between London and both New York and Philadelphia amounts to around 3,500 miles, and that between London and Bombay to approximately 4,470 miles, it may appear perplexing that one is considered close, and the other far away. As we have seen before, however, even New Orleans, whose linear distance to London amounts to more than 4,600 miles and which is thus even further away from the British capital than Bombay, is considered "as near to London as to its

[655] "A Guide to the Great Industrial Exhibition," Exhibition Supplement, *Illustrated London News*, 10 May 1851, 392.
[656] "The British Indian Submarine Telegraph," *Illustrated London News*, 20 November 1869, 518.

own suburb." Clearly, the uneven development of telegraphic infrastructure has left its mark on contemporaries' perceptions of distance.

As has also been seen previously, in connection with transatlantic telegraph cables the image of the globe being scaled down to the size of a city was drawn upon repeatedly. The same imagery was also used with regard to other technologies. Reporting the opening of the Great Exhibition in 1851, the *Illustrated London News* highlights that it was only by means of the consolidation and extension of global communication and transport networks that an event of this dimension could be realized. In this context, it is pointed out that

> [r]ailways were established, of which the speedy effect was to make this country one large metropolis to itself, and to make of Europe one large country, of which no part was more distant from another, if measured by time, than London and Edinburgh had been a generation previously. Steam upon the ocean lent its aid to the great work; the electric telegraph carried it a step further.[657]

We can thus once more observe how compressions in transport and communication space are represented as changes in geographic space; however, this statement is again qualified by the comment "if measured by time."

Furthermore, pointing out that scientists and engineers, by means of their findings and innovations, "leave in our hands the means of ubiquity,"[658] the *Visitors's Guide to the Great Eastern* alludes to the fact that a person's absolute location in geographic space is becoming less important than his or her relative location.

The above-mentioned passages therefore illustrate how transport and communication technologies impacted on nineteenth-century contemporaries' perception of time, space and distance; at the same time, however, the also show how contemporaries gave expression to these new experiences without resorting to the notion of the annihilation of time and space. As has been pinpointed in the samples on submarine cables to Australia, contemporaries were well aware of the effects new transport and communication technologies would have. It is therefore hardly surprising that they also reflected upon this on a meta-level. Dwelling on the effects the *Great Eastern* might have, the *Times* accordingly emphasizes that "[t]he result of this great experiment in shipbuilding (…) will be a consolidation of the British Empire such as we have not yet seen"[659] and subsequently explains why this is going to be the case:

[657] "The Great Exhibition," *Illustrated London News*, 3 May 1851, 343.
[658] Jackson, *Visitor's Guide to the Great Eastern*, 7.
[659] "Among the Passions," *The Times*, 18 April 1857, 8.

> Half of the space which separates the various sections of it from the mother country and from each other will be annihilated. Our colonies will be brought comparatively close to us, and, what is almost of as much importance as the actual vicinity gained, they will be more than twice as near to us in imagination. The difference between a month's voyage and two or three months is all the difference to the imagination. We think of a place as within reach, and within a home distance, it if is only 'a month off.' The whole Empire is thus brought into a home compass, and obtains the addiction of strength which so much greater union gives. We shall find ourselves paying visits to and receiving visits from India and Australia. Our friend will come over for the summer with return tickets, and the British Empire will become, in virtual compass, a province.[660]

Not only are distant dependencies thought of as being moved into the vicinity by means of the *Great Eastern* and the faster and more reliable passage it promises. It is also stressed how these improved connections will contribute to the integration of the British Empire. Concerning the 1858 transatlantic cable, the *Times* similarly expresses the hope "that before this generation has passed away England and the New World may in the opinion of their inhabitants be but one country."[661] In this context, it is pointed out that

> [i]t has been observed with truth that the United States, though continually extending their territory, have been yearly becoming for all purposes of intercourse smaller than they were. The increase of space to be travelled over is more than counterbalanced by the decrease of the time necessary for traversing a given distance. When the Union extended only from Massachusetts to Georgia a journey between the two extreme points took longer than a journey at the present day from the Atlantic to Kansas or Minnesota.[662]

Subsequently, the role communication technologies are going to play in the future is highlighted:

> It may be hoped that in a few years less time will be necessary to pass from England to California than is now occupied by the voyage from England to Halifax; and it is found that facility of communication, and, above all, that saving of time increases travelling in a ratio almost incredible.[663]

5.3 Chapter Summary

In the past as well as in the present, technologies of movement, be it of transport, communication or information, have a profound influence on the way we perceive time, space and distance and on which places we consider to be close or far away. Various models, approaching and conceptualizing this phenomenon from different angles, can help us contemplate related questions. Wenzlhuemer, for instance, concentrates on

[660] Ibid.
[661] "The Ubiquity and the Universal Influence," *The Times*, 20 September 1858, 6.
[662] Ibid.
[663] Ibid.

different spaces that are configured by the particular interest of the observer and points out how, with improving technologies of movement, the structure of what he refers to as communication or transport space is changed. As a result, these spaces can be compressed and the resultant divergence from geographic space brings about the notion that a certain place has moved closer.[664] Falk and Abler, on the other hand, focus on different types of distances and so-called distance paradoxes in order to explain this phenomenon: They illustrate how changing relations between what they call globe, effort and metaphorical distance impinge on our conception of what is close or far away.[665]

A close examination of the various Victorian print publications reveals that contemporaries' understanding of such circumstances extended beyond the naive assertion that time and space had been annihilated. Indeed, it appears that the slogan has little explanatory power as to changing perceptions of time and space after all, and is instead to be viewed in the context of dominion over nature. It cannot be denied that contemporaries' perceptions of what is near and what is far were influenced by new transport and communication technologies. It has also been seen, however, that the interconnection between a place's integration into the global communication and transport network, on the one hand, and the idea of it being closer (particularly in comparison to other areas that are integrated to a lesser extent), on the other, was well understood and alluded to repeatedly. Hardly surprisingly, it is particularly in the context of the electric telegraph and the new virtual space it brought about that such reflections are expressed. In the same way that the metaphor of the global village has become commonplace to describe the structural changes taking place from the later twentieth century onwards, the metaphor of a city and related imagery (suburb, neighbourhood) is drawn upon repeatedly in order to condense these new experiences. What is more, it is also pointed to the consequences such changing spatial perceptions might entail and how one might therefore actively avail oneself of this phenomenon.

[664] Cf. Wenzlhuemer, "Globalization, Communication, and the Concept of Space in Global History," 25-37.
[665] Cf. Falk and Abler, "Intercommunications, Distance, and Geographical Theory," 61f.

"For this reason, the Internet can be considered the first weapon of mass construction, which we can deploy to destroy hate and conflict and to propagate peace and democracy."[666]

6. Heal the World? Transport and Communication Technologies as Tools of Peace

In November 2009, the Italian edition of the US technology magazine *Wired* launched the project 'Internet for Peace'. The project proposed the internet for the Nobel Peace Prize of 2010 on the grounds that

> [w]ith its increased diffusion and accessibility, the Internet has clearly shown to be not only a network of computers connected together across the world or a container for web pages accessible to users, but a precious and powerful tool for global communication, capable to overcome walls and distances imposed by political and military constraints. The basic idea is that, being available to everyone and conveying messages of sympathy and humanity, the Internet really is a great tool for democracy.[667]

Chris Anderson, editor in chief of *Wired*'s US edition, further points out that "[p]eople want peace, and when given a voice, they'll work tirelessly for it. In the short term, a Twitter account may be no match for an AK-47, but in the long term the keyboard is mightier than the sword."[668] On the project's webpage, digital culture in general is presented as fostering "dialogue, debate and consensus through communication" and spreading "seeds of non-violence."[669]

In fact, we have been here before, and the notion that new means of communication will inevitably lead to better understanding among peoples from different parts of the world and therefore result in world peace is not new. With regard to transport and communication technologies of the time, Ferdinand de Lesseps, for instance, remarked that "[a]ll these enterprises of universal interest – some already completed, others under construction or projected – have an identical goal: drawing peoples together, and thereby bringing about an era in which men, by knowing one another, will finally cease fighting."[670]

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[666] "Internet for Peace, Press Release No. 1."
[667] Ibid.
[668] Ibid.
[669] "Internet for Peace, Manifesto," last viewed 3 December 2013. http://internetforpeace.org/manifesto.cfm.
[670] Ferdinand de Lesseps, letter to Maxime Hélène, November 6, 1882; cited in Headrick, *Invisible Weapon*, 3. Lesseps was by no means the only one to have such expectations. Concerning the inauguration of the 1900 German Atlantic Cable, for instance, US President McKinley commented that "[i]n this age of progress every tie that brings nearer in their commercial relations and friendly interests works [to] to their common good and can not fail to strengthen their cordiality and promote the mutual

These views, however, do not go unchallenged: As Larry Magid points out in an article published in the *Huffington Post*, there are a number of "not-so-peaceful" purposes the worldwide web may be employed for,[671] and even supporters of the Internet for Peace initiative point to the double-edged role it can play.[672] Moreover, recent developments, such as the revelation of mass internet and mobile phone surveillance programs, have not only shown how governments can employ modern information and communication technology in order to spy on their own and foreign citizens (which certainly is not part of the "new kind of society" the proponents of *Wired*'s project envisage[673]). They have also created international tension and diplomatic crises between the states involved. Clearly, the internet of itself is not going to usher in an era of universal peace.

With the benefit of hindsight, Headrick similarly points out how Ferdinand de Lesseps would have been astonished had he witnessed the technological innovations of the twentieth century and their many harmful repercussions, and concludes that "[i]f we have learned anything in the past century, it is that technology confers power, but that the consequences of that power are anything but predictable."[674]

This chapter investigates the expectations associated with nineteenth-century transport and communication technologies in terms of the improvement of international relations and the onset of an era of world peace. The comments by both the proponents of 'Internet for Peace' and by Ferdinand de Lesseps refer primarily to how the mutual understanding of nations could be improved, and both parties assume that peoples who were more familiar with each other and able to exchange messages of sympathy were less likely to go to war. As will be seen, this perspective is repeatedly highlighted in the various publications under scrutiny.

Moreover, the extent to which these new media impacted on the conduct of international relations and in what ways governments and their representatives availed themselves of them is scrutinized. As Headrick has suggested, the ramifications of these technologies for interstate relations are by no means as clear-cut as might be assumed at first glance. This will be illustrated on the basis of various historical case studies, before contemporaries' expectations as expressed in press coverage will be examined.

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advancement in their paths of peace." Telegramm from President William McKinley to Kaiser Wilhelm II, 30 August 1900, ct. in Nickles, "Diplomatic Telegraphy in American and German History," 143.

[671] Larry Magid, "Nobel Peace Prize for the Internet?," *Huffington Post*, 17 March 17 2010, last viewed 24 August 2013. www.huffingtonpost.com/larry-magid/a-nobel-prize-for-t_b_503394.html.

[672] Nobel Peace Prize laureate Shirin Ebadi, for instance, points out that the Internet "can also be used to fuel war and terrorism." "Internet for Peace, Press Release No. 1."

[673] "Internet for Peace, Manifesto."

[674] Headrick, *Invisible Weapon*, 3.

Speedy railway connections and steamship services certainly figured prominently in this context; nevertheless, it was electric telegraphy that "did more to change the practice of international diplomacy than any other innovation in modern history."[675] Accordingly, it will receive primary attention in the following pages.

6.1 Information, Communication and the Conduct of International Relations in the Nineteenth Century

In *The Invisible Weapon*, Headrick emphasizes that

> a timely flow of information is a vital instrument of power. Even the earliest rulers needed to know what was happening in their provinces and on their frontiers. In turn, they issued commands to their agents and subjects, hoping thereby to control events.[676]

As previously mentioned, information transmission times had been reduced considerably in the decades before the electric telegraph was introduced. Nonetheless, "[m]easured by the speed of communication, the world was still quite big in the early 1820s,"[677] and 'timely flows of information' were often – at least on a global scale – a matter of luck and favourable conditions, rather than reliable infrastructure. From a British vantage point, Paris, Brussels or The Hague and the surrounding areas were comparatively easy to reach and exchanges of letters could take place in a matter of days. Communicating with anyone located in Central or Eastern Europe, though, could be a cumbersome affair, with insufficient road infrastructure and seasonal hardships adversely affecting the travelling speed of coaches and messengers. A despatch from London to Constantinople, for instance, would in the 1840s still require several weeks. Corresponding with anyone outside of Europe would accordingly require even longer (as pointed out before, early nineteenth-century sailing ships took on average a month to travel between Britain and the US; in the 1860s, correspondence to South America or Japan would still take several months by surface mail).[678]

One consequence of these protracted journeys was that "the information given [could be] dangerously out of date by the time it was received."[679] Circumstances could have

[675] Nicholls, *Anglo-Japanese Diplomacy*, 1.
[676] Headrick, *Invisible Weapon*, 6.
[677] Kaukiainen, "Shrinking the World," 8.
[678] Cf. Jorma Ahvenainen, "Telegraphs, Trade and Policy. The Role of the International Telegraphs in the Years 1870-1914," in *The Emergence of a World Economy*, eds. Wolfram Fischer, R. Marvin McInnis and Jürgen Schneider (Stuttgart: Steiner-Verlag-Wiesbaden-GmbH), 2:507.
[679] Keith Hamilton and Richard Langhorne, *The Practice of Diplomacy. Its Evolution, Theory and Administration* (London: Routledge, 2011), 59.

changed decisively in either (or both) of the localities and the directions provided or questions posed were no longer up to date. This could even mean that major battles were fought after peace had been declared – with the slow speed of transport and communication, the news of a declaration of peace simply did not reach the battlefields in time.[680]

Looking at the events taking place in the run-up to the Anglo-American War of 1812, Nickles provides a vivid example of how these long transmission times and the resulting lack of 'timely flows of information' could bring about interstate hostilities and military conflicts.[681] There had, for some time, been a state of diplomatic tension between the US and Great Britain. There were several reasons for this, one being the so-called Orders in Council, a set of trade restrictions Great Britain had imposed in the course of the Napoleonic Wars. The orders sought to prevent neutral states from trading directly with France, and as a result, American merchants wanting to do business with continental trade partners had to ask for British permission and pay a charge before they could do so. The United States considered this to be an unacceptable interference with their national sovereignty. President Madison therefore issued a war message on 1 June 1812. Both houses of Congress supported Madison's measure, and war against Britain was declared on 18 June.

Meanwhile, the situation in Great Britain had greatly changed. Prime Minister Perceval, the initiator of the Orders in Council, had been murdered in May 1812 and was succeeded by Robert Jenkins. Given the fact that a growing percentage of the British population was dissatisfied with their government's commercial policy (which they thought aggravated the economic situation), the opposition submitted a motion demanding the repeal of the Orders on 16 June. The new government accepted the motion, but unfortunately, the despatch carrying the news of the revocation of the Orders, which in all likelihood would have appeased the US government, did not reach Washington until war had been declared. Withdrawing their declaration of war would have made the US government seem weak and vacillatory and was not something it was prepared to do. It was, therefore, the "disparity (…) between the relative speeds of

[680] A primary example for this is the Battle of New Orleans fought in January 1815, that is after the Anglo-American War had officially come to an end by means of the declaration of peace issued in Ghent the month before. In this connection, nineteenth-century contemporaries would later comment that this was a "most unnecessary battle," fought only "for the want of a submarine telegraph." *The Silver Jubilee of Submarine Telegraphy to the Far East* (London, [1894]), 12. See also Nickles, *Under the Wire*, 4.
[681] Cf. Nickles, *Under the Wire*, 17-21.

international and domestic politics"[682] which resulted in the Anglo-American War. Nickles thus argues that

> the crisis of June 1812 reveals an asymmetry between the speed of political decisionmaking and the speed of transatlantic communication. (…) This asymmetry resulted from the close relationship between distance and communication speed that existed before the mid-nineteenth century.[683]

It seems reasonable to argue that war could have been avoided, had there been transatlantic submarine cables in 1812, allowing heads of government to defuse a tense situation by communicating instantly: in so doing, information gaps could have been closed and the asymmetry Nickles mentions would have been counteracted.

However, Nickles strongly advises against such oversimplified speculations. He stresses that the telegraph's influence on intergovernmental communication and international relations was more ambiguous than might be assumed. In the past, he points out, the slow and erratic communication processes between the United States and Great Britain had several times helped averting war.[684] Moreover, even when telegraphic communication between two countries was established, there was no guarantee statesmen and decision-makers would avail themselves of this speedy channel of communication. There were, in fact, a variety of factors why they would refrain from using it, instead relying on 'old-fashioned' postal communication.

One of these factors was the high cost of both telegraphic communication in general, and that via submarine cables, in particular. At the outset, transatlantic messages were charged at a rate of $ 10 per word. For most governments, it was a matter of major importance to restrain their diplomatic representatives from sending exceedingly long or unnecessary telegrams. This attitude was particularly pronounced in the United States, and as a result, US ambassadors were permitted to send telegrams only in case of emergency. If the State Department subsequently deemed the telegram to be unnecessary, the diplomat involved was required to cover the expense. US diplomats would therefore give serious thought before wiring a message. It was for precisely this reason that Washburne, the American ambassador to France from 1869 onwards, decided to inform his superiors about the growing tensions between France and Prussia in 1870 by means of a despatch borne by steamship (which reached Washington after the onset of the Franco-Prussian War). Despite such obvious difficulties, the US

[682] Ibid., 21.
[683] Ibid.
[684] Nickles, *Under the Wire*, 19f.

administration adhered to these rules and repeatedly brought them to the attention of its ambassadors. It was hardly surprising then, that in 1914, the news about the escalating tension between Austria-Hungary and Serbia was also forwarded to Washington by letter, and only reached the US government on the eve of the declaration of war and the onset of the First World War.[685]

European governments issued similar instructions to their personnel: like their American counterparts, French diplomats had to cover the expenses for telegrams that were deemed unnecessary or too long;[686] in a similar manner, Great Britain and Germany also asked their diplomatic staff only to use telegrams in cases of emergency and extreme importance.[687] Occasionally, such instructions caused confusion among diplomatic envoys, who were no longer certain when sending a telegram was deemed essential and when they should avail themselves of traditional communication channels. Similarly, attempts to keep wired messages as concise as possible in order to reduce costs could create confusion, as intelligibility would be the victim of these austerity measures.

Another factor was the – admittedly justified – fear of espionage. Previously, the *cabinet noir* – the institution responsible for the interception of letters, related to the host country's post office – could be circumvented by sending messages of a highly sensitive content via special messengers, making use of diplomatic bags or sophisticated seals. With electric communication, however, sensitive information became more easily interceptable than ever before: As most national telegraph networks were state-controlled, the respective governments could effortlessly access the information exchanged between a rival state's government and its diplomatic outpost. [688]

Moreover, messages were regularly transmitted incorrectly, due to technical failure, human error (the Morse Code being extremely vulnerable to even the smallest inaccuracies in operating the telegraphic devices), illegible handwriting or the transmission of messages in foreign languages not spoken or understood by the particular operator. Encrypted messages, which were thought to circumvent the risk of espionage mentioned above, were similarly devoid of meaning to the operators, and therefore particularly susceptible to error. Many diplomats were aware of these problems, and, in order to make sure they had understood the instructions correctly,

[685] Cf. ibid., 177f.
[686] Cf. ibid., 176.
[687] Cf. ibid., 179.
[688] Cf. Headrick, *Invisible Weapon*, 5.

would often wait for the message to be confirmed by letter, thus – ironically – losing any time that had been saved in using the electric telegraph.[689]

There were other reasons why the establishment of more speedy channels of communication would not necessarily alter the way intergovernmental relations were conducted, such as lack of economic or political interest. This was particularly true in the relationship between Great Britain and Japan. From a British perspective, Japan was comparatively insignificant and mattered little on a political level or as a trading partner. Even Foreign Office staff posted to Japan knew relatively little about the country's culture, language and traditions, and the Foreign Secretary at home was concerned with other, at the time more relevant, outposts. Accordingly, the laying of a submarine cable between Nagasaki and Shanghai in 1871, by means of which Japan was connected to the steadily growing international telegraph network, had hardly any impact on official communication between the two countries.[690]

Another set of problems can be subsumed under Nickles' (admittedly relatively vague) umbrella term 'cultural inertia'. On the one hand, this refers to the fact that instantaneous communication was hardly compatible with the traditional lifestyle and working method of diplomats, who, at the time, mostly came from an aristocratic background. As has been pointed out by Hayne, "[i]n the late nineteenth century, diplomacy was still something of a leisurely hobby and was related to literary pursuits, horse-riding, hunting, and the establishment of fine literary and musical studios."[691] The stricter routine that instantaneous communication imposed upon them as well as the fact that messages could be sent and received at any time of the day did not suit diplomats' leisure-oriented lifestyle and was thus accepted only reluctantly.[692] What is more, diplomats' feared they would lose the autonomy they had enjoyed previously, as the telegraph enabled governments to keep a close eye on their diplomatic envoys and interfere in their daily business.[693]

In this context, the general question arises as to what extent a speedy technology of communication, such as the electric telegraph, was compatible with the way international relations were conducted at that time. Governments had usually exchanged information by letter, in which the parties involved would suggest compromises and

[689] Cf. Nickles, *Under the Wire*, 182.
[690] Cf. Nicholls, *Anglo-Japanese Diplomacy*, 14-18.
[691] M. B. Hayne, *The French Foreign Office and the Origins of the First World War, 1898 – 1914* (Oxford: Clarendon Press, 1993), 24.
[692] Cf. Nickles, *Under the Wire*, 122.
[693] Cf. ibid., 31-61.

solutions. The long transmission times of such letters gave them sufficient time to think through their positions and to prepare a measured response after some initial irritation and antagonism. Moreover, private conversations between diplomats and government representatives of the respective host country were part of the routine and allowed for an elaborate explanation of their particular point of view. In so doing, misunderstandings could be resolved more easily. This modus operandi could help to defuse critical situations and therefore avert possible military conflict. By contrast, the possibility of immediate communication could lead to a vicious circle in which an overhasty action could trigger a similarly impulsive reply, the result being that all parties involved were "forced (…) to make rushed decisions."[694] This situation was often made worse by the fact that the press also availed itself of the telegraph, which meant, in turn, that the public was well-informed about current events and public opinion inflamed to the extent that tough action would be expected and demanded from the government.

Two examples help illustrate why the electric telegraph was not necessarily the most expedient tool for international crisis management. Firstly, the Trent Affair of 1861: This crisis between the United States and Great Britain was caused by the US government's arrest of two Confederation commissioners who were on their way to Southampton aboard a British packet ship. The incident, which caused the British government to give an ultimatum to the United States, took place before transatlantic communication by telegraph had been established, and accordingly several weeks elapsed between the diplomats' arrest, the arrival of the news in Britain and the ultimatum being issued. In hindsight, as Nickles points out, "the *Trent* affair seemed to occur in slow motion."[695] [italics in original] This turned out to be beneficial in several respects: As mentioned before, statesmen had the opportunity to reconsider their point of view and could, if they felt there was need to do so, make amendments or changes to previously drafted letters and other documents. The British ultimatum, for instance, was toned down in the days prior to its despatch. Similarly, the public in Britain and the United States had become agitated in the immediate aftermath of the incident. In the weeks to follow, however, they had time to calm down and were therefore less bellicoset than at the outset. In this case, the lack of speedy communication by telegraph had positive effects and the Trent Affair is seen as a primary example of how "the use

[694] Ibid., 132.
[695] Ibid., 72.

of the telegraph in diplomacy, by eliminating periods of delay, would have created more problems than it solved."[696]

The second example is the July Crisis of 1914 and the resulting outbreak of the First World War. There can be no doubt that there was a variety of reasons leading to the outbreak of war, but

> [t]here is abundant evidence that one cause of World War I was a failure of diplomacy, and one of the causes of that failure was that diplomats could not cope with the volume and speed of electronic communication. Most of the aristocrats and gentlemen who made up the diplomatic corps in 1914 were of the old school in many respects, as wary of new technology as some generals were wary of newfangled weapons and strategies.[697]

Confirming the leisurely routine Kern refers to as old school diplomacy, the majority of the major European powers' diplomatic representatives would go on summer holidays at around the time of Franz Ferdinand's assassination. It was only one month later, at the time when Austria-Hungary gave Serbia the ultimatum, that they realized how serious the situation had become. Had they been at their respective outposts earlier, they could have provided important information (such as Russia's willingness to go to war in case of a military conflict between Austria-Hungary and Serbia). Once the diplomats were aware of the explosive situation, they communicated mostly via telegrams and press releases. By the outbreak of war, five ultimatums had been exchanged, each of them asking for an immediate reply. In so doing, the vicious circle mentioned above was set in motion. Nickles furthermore highlights that Austro-Hungarian decision-makers, eager to go to war, "exploited the telegraph's potential to accelerate the crisis, and thereby deprived Entente diplomats of the time they needed to resolve the conflict peacefully."[698] This development finally culminated in Austria-Hungary declaring war on Serbia on 28 July (the declaration of war being, ironically, sent via telegraph). Nickles therefore draws the conclusion that "[d]uring the July Crisis the telegraph accelerated events in a way that, on the whole, served the cause of peace less well than it facilitated the march to battle."[699]

As has been shown, the electric telegraph in principle had great potential with regard to the improvement of interstate relations. By means of timely flows of information, misunderstandings and disputes could be eliminated more easily and military conflict

[696] Ibid., 77.
[697] Kern, *Culture of Time and Space*, 75f.
[698] Nickles, *Under the Wire*, 132.
[699] Ibid., 133.

avoided. If one complies with Edgerton's request to study technology in use, however, one will come to the conclusion that the situation was decidedly more complicated. An extremely unpredictable concoction of factors could result in the parties involved using the electric telegraph inappropriately or not at all. Therefore, in critical situations, telegraphic communication could potentially worsen the state of affairs decisively. In what follows, the extent to which nineteenth-century contemporaries' were aware of this will be demonstrated.

6.2 Messengers of Peace? The Role of Transport and Communication Technologies for International Relations as Presented in the Victorian Press

As explained, the conduct of interstate relations was decisively transformed by the electric telegraph and the instant communication it promised. It is hardly surprising therefore that most evaluations of the seemingly peace-making qualities of new technologies can be found in the reporting on various submarine cables. Nonetheless, they also feature in connection with other technologies. In an article covering the inauguration of the Great Exhibition, the *Illustrated London News* points out that the organization and implementation of an event of this dimension has only been made possible by the speedy global transport networks which have recently been established. Here, it is highlighted how the railway network fostered mutual understanding by allowing for more frequent exchanges between European states:

> But the intercourse of nations, caused by the practical annihilation of space and time which we owe to the railway system, has removed a whole world of difficulties. It has made us all understand one another better than we did before; broken down the ancient barriers of jealousy and exclusiveness; obliterated the rancourous remembrances of bygone wars; softened the lingering asperities of traditional hatreds, and convinced the people of Europe of the great and useful fact, which is never too late to learn, that, if they had known as much of each other fifty or sixty years ago as they do now, there would, in all likelihood, have been no battles of the Nile, the Baltic, or Trafalgar, and no carnage of Aboukir, Marengo, Jena, Leipsic [*sic*], Moscow, Saragossa, or Waterloo.[700]

The same article also points to the role steamships could play in the context of transcontinental communication and the permanent prevention of military conflict and engages in speculations about the effects they might have had in the past:

> Who shall say, if we had had a railroad system pervading Europe in 1780, and steam-ships plying between New York and Liverpool at the same period, whether

[700] "The Great Exhibition," *Illustrated London News*, 3 May 1851, 343.

> Napoleon Bonaparte might not have become a great sculptor or a great cotton-spinner in 1810? whether [*sic*] Wellington, the mighty Captain, might not thirty years ago have been a philosopher greater and more genial than Botham, or Lord Chancellor more potent and profound than Eldon? whether [*sic*] a thousand battles would not have remained unfought? and [*sic*] whether the millions of men that perished in them might not have helped to adorn and improve a world which they were solely engaged in ravaging?[701]

Reporting the launch of the *Great Eastern* steamship, the *Illustrated London News* also points to the influence the ship will have on both international commerce and relations:

> How much economy of time, how much saving of waste and depreciation of goods, will be comprehended in the vast carrying capabilities of such a vessel! How much will be gained by such a ready competition of conveyance with demand and production, and how large a share will such a ship not contribute to the interchange of feeling, habits, tastes, and sympathies, to which, in spite of recent experiences, most of us still look as the true means for realising the best interests of mankind – peace and good-will among the nations of the world![702]

Concerning the breakthrough at the Mont Cenis Tunnel, the *Times* points out that "[in] the midst of a desolating [Franco-Prussian] war, and at a time when its horrors are deepening under the rigour of the season, we are cheered by the news that one of the greatest of the works of peace has been brought to a conclusion."[703] Juxtaposing the Alpine tunnel with the Franco-Prussian War, its peace-making qualities are all the more underlined. Once completed, it is further remarked, the tunnel will allow for "constant and unrestricted intercourse which we have learnt to look upon as essential to nations."[704]

Nonetheless, it is the electric telegraph that received particular attention in this context. The first messages to be transmitted via the 1858 submarine cable already bear witness to the peculiarly high hopes and expectations pinned to the telegraph. Soon after the cable had begun operation, "[a]n interchange of courtesies between the city dignitaries of New York and London was (…) commenced."[705] The Mayor of New York solemnly declares that "[i]t is a triumph of science and energy over time and space, uniting more closely the bonds of peace and commercial prosperity, introducing an era in the world's history pregnant with results beyond the conception of the finite mind,"[706] to which his London counterpart replies that he hopes the cable "may be the means of cementing

[701] Ibid.
[702] "The 'Great Eastern' Steam-Ship," *Illustrated London News*, 7 November 1857, 450.
[703] "In the Midst of a Desolating War," *The Times*, 26 December 1870, 7.
[704] Ibid.
[705] "The Atlantic Telegraph," *The Times*, 24 August 1858, 7.
[706] Ibid.

those kindly feelings which now exist between the two countries."[707] Admittedly, such ornate language was part of the etiquette of official correspondence of the time.[708] It was not only dignitaries, though, waxing lyrical about the first functional transatlantic cable in their congratulatory messages. Prior to the laying of the cable, the *Manchester Guardian* predicts that

> languid commerce will revive at the prospect of immediate connection between the two worlds, and the pledge which this Atlantic telegraph will give of the continuance to all time of uninterrupted amity between England and the United States.[709]

The *Illustrated London News* similarly declares that "Europe and America are (…) for trading, negotiation, and the interchange of communications of amity and good will (…) practically as near as next-door neighbours in a London street"[710] and further points out "[i]t seems, indeed, absurd and next to impossible to imagine that Great Britain and the United States of America should interchange by that medium any messages of hate, rancour, or hostility, or any communications but those of commerce, diplomatic courtesies, or combined movement for the good of mankind, and the preservation of the peace of the world."[711] The *Times* points out that "the effect of bringing the three Kingdoms and the United States into instantaneous communication with each other will be to render hostilities between the two nations almost impossible for the future."[712] Subsequently, the effects telegraphic communication might have had concerning the "three last instances of difference between ourselves and our Transatlantic cousins"[713] is considered and its significance as a tool for crisis management is emphasized:

> These have been – first, as to the right of visiting vessels with the view of ascertaining their nationality; secondly, the question of the fisheries; and, thirdly, that of the enlistments during the Russian War. Now, it is not too much to say that the most fiery politician in the States, who might have been desirous of making a little political capital out of these notable heads of quarrel, would have been fairly checkmated if the English Government had possessed the power of undeceiving the American public before the sparks had been fanned into flame. There ought not between two nations whose interests are clearly identical to be any points of difference which honest Ministers on either side could not just adjust in a few hours by the help of the Atlantic Telegraph.[714]

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[707] Ibid.
[708] Although, as Wenzlhuemer has pointed out, telegraphic communication did indeed allow for "temporary suspension of protocol" and brought about a less formal tone in official correspondence. Wenzlhuemer, *Connecting the Nineteenth-Century World*, 19.
[709] "The Atlantic Telegraph," *The Observer*, 30 May 1858, 6.
[710] "The Whole Civilised World," *Illustrated London News*, 7 August 1858, 124.
[711] "Our Readers will not Think," *Illustrated London News*, 21 August 1858, 168.
[712] "We Publish to-day," *The Times*, 23 August 1858, 6.
[713] Ibid.
[714] Ibid.

Moreover, it is remarked that the speedy communication between the United States and Great Britain allows for improved coordination between the two countries, and that therefore other states would not dare to wage war against them:

> It is scarcely too much to suppose that if the two great Anglo-Saxon states remain firmly united – fused together, as they now are, by this electric agency – he would be a bold continental statesman who should venture to try conclusions with them in a warlike way. United, we are masters wherever there is salt water enough to float a ship's boat. There can be no stronger guarantee for the peace of the world.[715]

Admittedly, it also alludes to the role telegraphy could play in a military conflict – Britain and the United States being able to outmanoeuvre other states by means of the electric telegraph – yet this aspect is not dwelt on any further at this point and the principal assumption is that the newly laid cable will guarantee world peace. Therefore the article concludes with the words: "May the triumph be as lasting as it is glorious, and bring forth fruit in the form of perpetual amity and goodwill between the great Anglo-Saxon communities!"[716]

Around one month later – that is after the 1858 cable ceased functioning – the *Times* once more stresses the significance of electric telegraphy in general for the conduct of intergovernmental relations. The readers are informed that, as soon as submarine cables have been installed,

> we may indeed look forward to a future widely different from anything that the world has yet seen. As Lord NAPIER [*sic*] observes with justice, 'Something may be detracted from the functions of diplomacy, but much will undoubtedly be gained for the peace of nations.'[717]

The article thus relates to the idea that diplomats' independence would be curtailed and their status diminished with the advent of these improved means of communication.[718] It also points out that the electric telegraph and the direct communication between political decision-makers of different states it allows for will inevitably be conducive to universal peace. The *Times* further declares that it is "from this increased acquaintance with each other that we anticipate harmony in the relations of England and America, and that concert in action which may become necessary at some conjunctures."[719]

[715] Ibid., 6f.
[716] Ibid., 7.
[717] "The Ubiquity and the Universal Influence," *The Times*, 20 September 1858, 6.
[718] Cf. Nickles, *Under the Wire*, 31-61.
[719] Ibid.

Consequently hopes and expectations were raised high when another attempt to lay a transatlantic cable was undertaken in 1865. Public figures, such as John Pender, "expressed [the] belief and hope that the cable would be successfully laid, and that it would promote the happiness, the communion, and the peace of Great Britain and the United States."[720] When the fourth attempt to lay this cable was successful, its peace-making qualities were again emphasized. The *Illustrated London News*, for instance, declares that

> [i]nternationally, Governments and peoples brought into the presence of each other will be less liable to misconception, less unconcerned about each other's doings, less likely to brood over fancied offences, less exposed to many of the causes which lead to war. If no other results should follow than those we have just stated, and which are rather certain than speculative in their character, humanity would yet have abundant reason to bless the day which witnessed the completion of the Anglo-American Telegraph. [721]

The *Times* similarly declares that

> [t]he prospect opened to the world by this achievement is so marvellous that any attempt to describe it must give only a faint and feeble picture. The two most active and energetic nations of the globe are placed in hourly communication. The Governments of England and the United States will be able to converse rapidly and freely, removing misconceptions should they arise, and transacting their affairs without the delay of a voyage during which the face of events may be changed.[722]

These passages therefore point to what was assumed to be two major improvements inherent to the instantaneous communication brought about by electric telegraphy: on the one hand, misunderstandings could be eliminated more easily and could therefore no longer be regarded as a potential reason for military conflict; on the other, that the problem of information being outdated and obsolete once it reached its destination after several weeks could be remedied. *Lloyd's Weekly Newspaper* therefore draws the conclusion that this "connecting link between the continents will silently bind the two nations together, add to the prosperity of both, and furnish an ever-growing guarantee for harmony and peace."[723]

A few months earlier, at around the time of the cable's inauguration, *Lloyd's Weekly Newspaper* had drawn a vivid comparison which contrasted the peace-making qualities of electric telegraphy with the Austro-Prussian War, which was fought at approximately the same time.

[720] "The Relations between England and America," *Manchester Guardian*, 24 June 1865, 5.
[721] "The Anglo-American Telegraph," *Illustrated London News*, 4 August 1866, 102.
[722] "Within a few Hours," *The Times*, 27 July 1866, 9.
[723] "Our Contemporaries," *Lloyd's Weekly Newspaper*, 4 November 1866, 11.

> While the great armies of Austria and Prussia were staining the fatherland with blood, that wonderful monument of English enterprise and skill, the Great Eastern, was steadily bearing across the broad waters the thin cord that is destined in time to work suppression of armies, and the destruction of armour-clads and turret-ships. [724]

It is furthermore pointed out that the "thin cord that is presently to girdle the earth, albeit thinner than a baby's wrist, has a power in it which armies in the full pomp and tide of war have not."[725] In future, it is assumed, there will be no more war or conflict between the United States and Great Britain, for the cable is

> a thread of gold to bind the friendly hands of the two great Anglo-Saxon races together. The heart of Brother Jonathan can vibrate through this frail wire to that of his kinsman, John Bull. Mutual explanations can be made in a few hours instead of a month.[726]

In this context, reference is also made to previous conflicts, such as the Trent Affair, and it is suggested that this incident could have been avoided if only there had been a transatlantic telegraph cable at that time: "The Americans would have known at once what the feelings of Englishmen were with regard to that unfortunate matter, and so much ill-blood would have been spared on both sides."[727] In conclusion, it is asserted that

> a scientific and commercial triumph has been added to the page of our country's history that will be set by future generations in glorious contrast with that of wrong and of bloodshed, which was enacting in Germany, while the Great Eastern was slowly and grandly bearing her messenger of peace and goodwill from the east to the west. [728]

According to the article, there can be no doubt about the transatlantic cable's peacemaking qualities; rather, by directly contrasting the cable-laying procedure with the Austro-Prussian War and by means of an appropriate choice of words (baby's wrist, thread of gold, friendly, triumph, vs. staining the fatherland with blood, bloodshed, wrong) the electric telegraph's contribution to the maintenance of good inter-governmental relations is emphasized.

All told, the passages quoted above bear witness to a technologically determinist perspective: in retrospect, it is assumed that certain conflicts and battles could have been averted if only railways and steamships had existed back then, allowing for speedier transmission of information and giving peoples the opportunity to get to know each

[724] "The Atlantic Cable," *Lloyd's Weekly Newspaper*, 5 August 1866, 1.
[725] Ibid.
[726] Ibid.
[727] Ibid.
[728] Ibid.

other better. Similarly, the mere fact that a telegraph cable has been put in place and is at the disposal of government officials and other policymakers is deemed to usher in an era of peace and goodwill. Other factors, which might work against this development, are not taken into consideration.

This is only one side of the coin, though. There are also articles which challenge such biased representations of the electric telegraph and raise doubts as to its peacemaking qualities. Already in connection with the first attempt of laying a transatlantic cable in 1857, the *Times* reprints an article (originally published in the *New York Times*), in which the cable's effects are questioned:

> It is impossible to comprehend the far-reaching results of this wonderful adventure. It is the marriage of the two hemispheres of the globe, but whether the marriage is to be for the better or for the worse who shall say? The gulf of waters by which nature has separated hostile continents is bridged by the electric chain of thought; and people of diverse languages and uncongenial habits are made immediate neighbours. But too much familiarity with our antipodes may beget a dangerous contempt, and it is possible that we shall be led to entertain less friendly feelings for our far-fetched neighbours than we have now, while the ocean separates us from them. [729]

This is interesting in several respects. To start with, this article, challenging the view that the submarine cable and the instantaneous communication it allows for will necessarily have a positive influence on transatlantic relations, was originally published in an American newspaper. This obviously raises the question to what extent British and American opinions diverge on this topic, that is, whether the enthusiasm with which the opportunity of instant transatlantic communication was hailed was a specifically British perspective. What is more, one might easily get the impression that the former British colony was not especially keen on being able to communicate instantly with any of the European countries. British publications, as has been pointed out, repeatedly emphasized the close relationship between Britain and the US. By contrast, this article describes the relations between Old and New World as distant, if not hostile, without mentioning any particular country.

However, articles challenging the effect instantaneous communication was going to have on Anglo-American relations were also printed in British newspapers. Despite pointing out that "the facilities for prompt intercourse between nation and nation must be, in the main, increasingly favourable to peace and goodwill," the *Liverpool Mercury* suggests that it is "possible (…) to exaggerate the peace-making virtues of the Atlantic

[729] "The Atlantic Telegraph," *The Times*, 6 January 1857, 12.

telegraph."[730] The reason for this is the circumstance that "[t]he friendly or unfriendly purport of the messages which may hereafter be borne to us under the ocean will depend, not on the rapidity with which they are conveyed, but on the temper and character of those who send them."[731] All in all, though, the article is rather optimistic as to the effects of telegraphic communication on international relations:

> It is something, however, to know that 'misunderstandings,' properly so called – and most international differences originate in a want of mutual understanding – will naturally be less frequent and less protracted in proportion to the promptitude with which explanations can be given and received. We willingly hope that with the progressive development of the telegraph system we may have fewer and fewer of those irritating disputes with the United States which have too long periodically embittered our relations with them.[732]

Around two weeks later, the *Liverpool Mercury* once more reports on the newly inaugurated transatlantic cable, pointing out that

> [i]t is impossible to think of the communication so happily established between the Old and New Worlds without being encouraged to hope that the telegraphic union of two kindred nations may prove at once the symbol and promoter of another and a better sort of union, and that the material link existing between them may link them for ever [*sic*] in the mutual friendship and brotherhood which would so greatly conduce to the highest interests of both.[733]

Similar to the article published around a fortnight earlier, though, it is subsequently declared, that "the peace-making virtues of the cable will depend, not on the rapidity with which it transmits the messages entrusted to it, but on the temper of the senders."[734] Nonetheless it emphasizes "the cordial international feeling which its successful completion has elicited both among ourselves and our Transatlantic kinsmen," for which it "anticipate[s] that the very existence of facilities for instantaneous communication will of itself produce new sentiments of friendliness and goodwill."[735]

Concerning the attempted cable-laying of 1865, the *Times* similarly observes that the "establishment of telegraphic communication with America […] on the whole […] cannot fail to prove of advantage to the two nations" and therefore demands that "GOD

[730] "The Atlantic Telegraph," *Liverpool Mercury*, 10 August 1858, 8.
[731] Ibid.
[732] Ibid.
[733] "The Atlantic Telegraph at Work," *Liverpool Mercury*, 25 August 1858, 4.
[734] Ibid.
[735] Ibid.

[*sic*] speed the Atlantic telegraph."[736] Previously, though, it has been made clear that communication via the electric telegraph alone is not going to solve interstate conflicts:

> The mechanical triumph of uniting the two Continents together, whenever it is accomplished, will justly be deemed enormous, but it is, perhaps, possible to overrate the importance of the feat as a step in the progress of civilization. At best, the means of communication is of less importance than the thing communicated.[737]

At this point, it is also highlighted that

> telegraphic despatches are, at the best, hasty and imperfect. Our information comes more quickly, but it is less complete. This is of slight importance when the intelligence only serves to excite our curiosity, but there are occasions when the transmission of imperfect telegrams might produce serious embarrassment.[738]

In this connection, the article also refers to the Trent Affair and the fact that it took place at a point in time when there was no transatlantic telegraphic communication possible. Concerning the assumption that this crisis could have been avoided or at least eliminated most speedily by means of electric telegraphy, it is pointed out that

> [t]his is very doubtful. It seems more probable that the exultation of the American public at the capture of the obnoxious Commissioners would have been known in England, and the resentment of our own people at the want of respect to the national flag would have been known in America, long before the voice of reason could have been heard, and the exasperation of both nations would have been increased. The rulers would have found it impossible to control the passions of the ruled, and the happy settlement of the dispute which did take place would have been impossible. It is unnecessary to multiply instances, which are only too apparent, of the dangers of half-knowledge. Every one [*sic*] will hope that we may escape such dangers, but we can only do so by remembering the imperfections of telegraphic news, and by withholding our judgment in the exercise of a large charity until we are furnished with ampler details.[739]

Similar comments can be found in an article published a few weeks later in the *Liverpool Mercury*. Here, it is first of all emphasized that

> while it would be far more foolish to expect nothing than to expect too much, we are not at all sure that in point of fact the immediate results of a successful laying of the Atlantic cable might not have been more or less disappointing to those who looked to it as an inauguration of a kind of political millennium of peace and goodwill. After all, a friendly feeling between two nations does not depend so much on rapidity of communication as on the nature of the matter to be communicated.[740]

[736] "A Second Time has an Expedition," *The Times*, 18 July 1865, 9.
[737] Ibid., 8.
[738] Ibid., 9.
[739] Ibid.
[740] "The Atlantic Telegraph," *Liverpool Mercury*, 9 August 1865, 6.

In contrast to what has been assumed in 1858, it is pointed out that the mere establishment of speedy channels of communication will contribute little to the improvement of the relations between the two countries:

> If England and America do not entertain sentiments of amity and kindliness towards each other, these would certainly not be instantaneously created by the mere fact that an instrument existed for the speedy transmission of messages between the two countries. It would be a terrible mistake to regard an electric wire bringing London and Washington, Liverpool and New York, within speaking distance of each other, as a talisman for peace which should render superfluous all mutual endeavours to cultivate amicable relations – a mistake which, if it was made, would probably soon exhibit the telegraph in a character very unlike that of a peacemaker and friendly mediator.[741]

Subsequently, it is also commented on the Trent affair and the way telegraphic communication between the countries involved could have influenced the incident:

> The power of giving instant expression to the feelings of the moment is one which, between nations as between individuals, needs to be accompanied with much caution and forbearance if it is not to be rather a cause of quarrels than a preventive. For our own part we cannot regard it as nearly so certain as it is sometimes said to be that an Atlantic telegraph, had it existed at the time of the Trent outrage, would have operated as an absolute security against all risk of war. We are afraid it might be maintained with at least equal plausibility that an apparatus which would have admitted of the exchange of manifestoes before the first feelings of exasperation on both sides had had time to cool might have appreciably increased rather than diminished the danger of a rupture.[742]

Moreover, it is highlighted how technical failure in the transmission of telegrams might cause conflict and discord:

> Nor must it be forgotten that telegraphy itself may occasionally be responsible for creating a misunderstanding, quite irrespectively of any faults of temper or discretion on the part of those who avail themselves of its services. A telegram blunder in the transmission has not unfrequently been a cause of considerable diplomatic uneasiness and popular irritation; and curiously enough it so happened that one of the very few messages carried by the first Atlantic cable – that from the Queen to President Buchanan – was so mutilated in the delivery that in the form in which it first reached America it was productive, if not of actual soreness, at least of considerable disappointment.[743]

In the summer of 1866, the *Liverpool Mercury* again dwells on the effects a transatlantic telegraph cable is going to have on the relation between the countries involved and remarks that the "moral and political advantages of telegraphic intercourse between England and America have perhaps sometimes been spoken of too unconditionally, as if

[741] Ibid.
[742] Ibid.
[743] Ibid.

mere physical propinquity were in itself an absolute guarantee for mutual goodwill."[744] It is furthermore pointed out that "[i]t its certain that, where unfriendly feeling exists, new facilities for its rapid expression may be a loss rather than a gain."[745] Nonetheless, it is assumed that by means of the cable, tensions and conflicts can be prevented, for

> it is equally certain that unfriendly feeling between communities, as between individuals, is frequently engendered or prolonged by mutual ignorance, and that a nearer and more constant intercourse may dissipate jealousies which isolation would perpetuate. We may at least assure ourselves that that very large class of international quarrels which may be described with literal accuracy as 'misunderstandings' will become less and less possible in proportion as impediments to intercourse are broken down and boundary lines effaced.[746]

In October the same year, *Lloyd's Weekly Newspaper* refers to an article from the *Daily News*, which also voices doubts concerning the peacemaking qualities seemingly inherent in the submarine cable. In this connection, *Lloyd's Weekly Newspaper* points out that the previously installed European network of landlines can by no means be said to have eliminated military conflicts:

> The European telegraph system is tolerably complete, and yet the nations whom it unites are not beating their swords into ploughshares, but converting their rifles into breechloaders. It is gratuitous to attribute to ocean telegraphy pacific effects which overland telegraphy does not possess.[747]

Moreover, the general question of the agency of technology is contemplated. On the one hand, it is highlighted that "[t]he telegraph is a machine for the conveyance of news, thoughts, and feelings. It transmits them, good or bad, but it does not change them from bad to good."[748] Nonetheless, though, it is emphasized that

> it would be erroneous to divest it of all moral effects whatsoever. The printing press is as neutral between good and evil as the telegraph. Truth and error, an honest and a malevolent purpose, use it alike. Yet who can deny that it is a powerful agent of morality and civilisation? It seems to be a law that equal facilities strengthen more the naturally stronger power.[749]

It is therefore pointed out that "if what is good in human nature is on the whole preponderant over what is evil, it is not Quixotic to look for moral progress from the telegraph." [750] Consequently, the conclusion is drawn that the "enthusiasts who anticipate a millennium from the Atlantic cable, and the sceptics who say that it will

[744] "The Atlantic Telegraph," *Liverpool Mercury*, 30 July 1866, 6.
[745] Ibid.
[746] Ibid.
[747] "Our Contemporaries," *Lloyd's Weekly Newspaper*, 7 October 1866, 11.
[748] Ibid.
[749] Ibid.
[750] Ibid.

leave the balance of good and evil just as before, both see only half, or some smaller fraction, of the truth."[751]

In the reporting on transatlantic telegraph cables quoted above, various factors, suggesting that electric telegraphy would not necessarily turn out to be the promised peacemaker, are taken into consideration. It is repeatedly pointed out that it is the factual content and tone of a correspondence, rather than its transmission time, that is most important. It is furthermore emphasized that lack of detailed information and the garbled state in which telegrams at times arrived could also aggravate, rather than ease a given situation. Moreover, it is suggested that in case of the Trent Affair, speedy means of communication would not necessarily have had positive effects; instead, there is the suggestion that exasperated politicians, under pressure from an inflamed populace, could have worsened the situation by means of instantaneous telegraphic communication. Contrary to the coverage quoted previously, displaying a strictly technologically determinist perspective, these articles therefore illustrate that there was an awareness and understanding of the fact that it is the practical employment of any new technology that needs to be examined when trying to predict and understand its effect.

The opening of the Suez Canal a few years later again fueled speculations about its potential effects. The canal being built under French control and against the will of the British government, it is hardly surprising that reporting in the British media is marked by a touch of scepticism. The *Times*, for instance, declares a few months before the inauguration that "[i]t is quite impossible to say what political or commercial results may not flow from the opening of the Suez Canal if that waterway should actually come into use as its promoters anticipate."[752] Around two weeks after the official opening, the *Observer* addresses the question whether the canal would usher in an era of universal peace. In this connection, it is highlighted that similar hopes and expectations have been pinned to previous technologies of transport and communication.

> It is an invariable custom to predict for the completion of great and important works the commencement of some new era of progress, and some fresh advance in the cause of civilisation, or the promotion of the blessings of peace – to regard it, in fact, as 'something accomplished, something done,' in the great cause of the world's civilisation.[753]

[751] Ibid.
[752] "While the Viceroy of EGYPT," *The Times*, 29 June 1869, 9.
[753] "It is an Invariable Custom," *The Observer*, 5 December 1869, 4.

It is subsequently pointed out, though, that "[experience] has shown that in almost every case the predictions are falsified by events, and that in spite of all the obstacles that are overcome, human nature remains much about the same, and its tendencies in the direction of strife are practically unchanged." Examples given include the Great Exhibition, "which was to usher in the dawn of universal peace and brotherhood," but which "had scarcely been dispersed before Europe was involved in the Crimean war," and the "Italian war [following] close upon the similar display of the world's products at Paris."[754] It is further remarked that "[w]ere we disposed to indulge in a philosophical dream on the subject we might point to many occasions of a similar kind when the most sanguine hopes for the future were doomed to serious disappointment."[755] Again, it is pointed out that the mere inauguration of yet another channel of transport and communication is not going to prevent any interstate conflict; rather, it is once more emphasized, that non-technological factors, such as 'human nature', figure prominently in this context. Concerning the Suez Canal, it is therefore pointed out that "[i]t would appear that M. LESSEPS' [*sic*] great work of the Suez Canal is likely to supply another illustration of the vanity of human wishes."[756]

Three weeks later, the *Observer* once more elaborates on the expectations pinned to the opening of the Suez Canal, this time in an article on the political situation prevailing in Europe and potential disarmament of the various countries' troops.

> [T]he completion of the Suez Canal, when representatives of all nations stood on its banks and saw the waters of the two seas mingle together, like the opening of our Great Exhibition of 1851, promised the inauguration of a reign of universal peace, and an immediate conversion of the swords into ploughshares, and the bayonets into reaping hooks.[757]

Subsequently, the question is raised "whether Europe now is, or, indeed, ever will be, sufficiently ripe for disarming on the appeal of any of the existing powers," the answer to which is given immediately:

> [S]o long as mutual suspicion, national vanity and jealousy, the memory of decisive victories, and the desire for further aggrandisement rankle in the mind of European rulers and statesmen, it will be vain to expect (…) that they will reduce their military establishments.[758]

[754] Ibid.
[755] Ibid.
[756] Ibid.
[757] "When we Read the Curt Telegram," *The Observer*, 26 December 1869, 4.
[758] Ibid.

In similar fashion to the article published earlier the same month, it again alludes to various other, highly significant parameters – such as mutual distrust among the Great Powers, exaggerated nationalism, and collective memory of past triumphs – that play a decisive role when it comes to the conduct of international relations.

6.3 Chapter Summary

In the past as well as in the present, technologies of transport, communication and information have, in popular belief, frequently been credited with peacemaking virtues. The underlying idea is that the mere existence of speedy channels of communication and exchange allows for a deeper acquaintance with other cultures and thus fosters mutual understanding. What is more, it has been assumed that, availing oneself of tools of instantaneous communication, misunderstandings and wrong conclusions could be smoothed out easily and would thus not result in military conflict. Clearly, this is technological determinism in its purest form: this rationale does not take into account any non-technical factors, such as the motives or the behaviour of the actors involved.

As regards the electric telegraph, however, there is a broad spectrum of factors (such as expense, fear of espionage, technical failure or reservations on the part of the parties involved) which would deter actors from making full use of it. Even when they did avail themselves of telegraphic communication, there was no guarantee this would ease the situation. Quite the contrary: sometimes, the rapid exchange of messages would intensify critical situations.

Indeed, in the material under examination in this study, we can find evidence that transport and communication technologies – specifically the telegraph – were credited with peacemaking qualities. In accordance with the technologically determinist view that a particular technology would necessarily bring about a certain result, it was assumed that the mere fact that it was possible to communicate within hours or minutes, rather than weeks, would help eliminate misunderstandings between government officials and other policymakers and therefore render military conflicts unnecessary, if not downright impossible. What is more, the telegraph, railways and steamships were credited for giving contemporaries the opportunity of getting to know other cultures better, which, it was thought, would prevent war and conflict.

Besides such oversimplified views, however, we can also find articles which suggest that contemporaries were well aware of the ambiguous role the electric telegraph could play in the context of intergovernmental communication and crisis management. They contemplated, on the one hand, the problems and misunderstandings that could result either from the concise style in which telegrams were written or from error during transmission. Moreover, it is repeatedly claimed that it is the actors involved (that is, both sender *and* receiver of a message) and their intentions and perceptions that are most important, rather than the sheer speed of electric telegraphy. In compliance with approaches that study technologies as they are actually used, it is thus emphasized that one has to contemplate the interplay of the various factors, rather than studying the telegraph in isolation. In line with this, previous events and technological achievements, which failed to fulfil contemporaries' high expectations, are drawn upon in order to illustrate that such one-sided analyses cannot provide any useful results concerning transport and communication technologies' ramifications on interstate relations.

"India, she had found out, was a place of political intrigue and economic corruption, a place occupied by real people with their incessantly human needs, desires, ambitions, and aspirations, and not the exotic, spiritual, mysterious entity that was a creation of the Western imagination."[759]

7. Technology and the Other: Transport and Communication Technologies, Collective Identity and Interstate Rivalries

In *Machines as the Measure of Men*, Michael Adas draws upon a passage from Mary Kingsley's *West African Studies* in order to illustrate how, in the nineteenth century, technological achievements were deemed proof of British superiority.[760] Here, Kingsley comments as follows:

> All I can say is, that when I come back from a spell in Africa, the thing that makes me proud of being of the English is not the manners or customs up here, certainly not the houses or the climate; but it is the thing embodied in a great railway engine. I once came home on a ship with an Englishman who had been in South West Africa for seven unbroken years; he was sane, and in his right mind. But no sooner did we get ashore at Liverpool, than he rushed at and threw his arms round a postman, to that official's embarrassment and surprise. Well, that is just how I feel about the first magnificent bit of machinery I come across: it is the manifestation of the superiority of my race.[761]

Kingsley's comment not only pinpoints the significance of technological accomplishments – in this case, a railway engine – as symbols of British superiority. It also illustrates the extent to which machinery mattered in terms of her self-conception as an English: eventually, the 'great railway engine' she mentions seems to evoke more tender feelings toward her home country than customs, architectural style or the seemingly 'typically English' weather.

This chapter therefore examines the role nineteenth-century transport and communication technologies were ascribed in contemporary reporting in the context of the formation of collective identities. In this respect, it investigates two distinct, albeit closely interwoven aspects: On the one hand, transport and communication technologies were considered what Adas aptly calls 'measures of men' in terms of a juxtaposition of

[759] Thrity Umrigar, *The Weight of Heaven* (New York: Harper Perennial, 2010), 51.
[760] Cf. Adas, *Machines as the Measure of Men*, 147.
[761] Mary H. Kingsley, *West African Studies* (London: Macmillan, 1899), 386.

Eastern and Western civilizations.[762] The chapter will thus investigate the roles contemporaries attributed to these technologies in an imperial context. It will show that the ways in which both Eastern and Western industrial and technological products were represented in the contemporary British press supported the idea of Western superiority and served as a justification for imperial efforts and policies.

Further, the chapter is concerned with the creation and consolidation of British collective identity and the roles transport and communication technologies played in this context. In this connection, it takes into account that machines could act as measures of men not only in an imperial context: in fact they also served as an arena for interstate rivalries as regards Britain's relations to its former colonies in North America and its continental neighbours.

First of all, however, a brief word on terminology is necessary. Whereas Kingsley points out how being *English* is a source of pride to her, Adas refers to feelings of *British* superiority. Rather than accusing Adas of semantic inaccuracy, one should keep in mind that this English/British metonymy has a long tradition. Linda Colley points out that in the eighteenth century 'England' was used referring to "much more than just one part of the island" and became "a synonym for Great Britain as a whole and very often for its empire as well."[763] Certainly, such inaccuracies could – and indeed frequently did – connote the desire of English supremacy over its immediate neighbours and the wish to "[subsume] Britain under the auspices of 'Greater England'."[764] But, as Colley and Marshall have emphasized, contemporaries did not necessarily look at it from this point of view – the English, the Scots and the Welsh did in equal measure use the terms England/English when they actually meant Britain/British.[765] As will be seen below, the 'English' achievements in the field of transport and communication technologies were mostly considered to represent a particular 'spirit', 'genius' and skillfulness when they were juxtaposed to the inventions of other, for instance continental, states (rather than being deemed a symbol of English superiority compared to the Scots and the Welsh).

[762] Hairs may be split about the various definitions of 'Eastern', 'Western' and related terms, such as Orient and Occident. In this chapter, I use 'Western' to refer to Europe and North America. 'Eastern', in turn, denotes both South, South East and East Asia as well as the Maghreb area.

[763] Linda Colley, *Britons. Forging the Nation. 1707 – 1837* (New Haven: Yale University Press, 1992), 162.

[764] Sarah Grandage, "Imagining England: Contemporary Encodings of 'this sceptred isle'," in *This England, That Shakespeare: New Angles on Englishness and the Bard*, eds. Willy Maley and Margaret Tudeau-Clayton (Farnham: Ashgate, 2010), 145

[765] Cf. P. J. Marshall, "Empire and British Identity: The Maritime Dimension," in *Empire, the Sea and Global History: Britain's Maritime World, c. 1760 – c. 1840*, ed. David Cannadine (Basingstoke: Palgrave Macmillan, 2007), 43.

Moreover, 'English' and 'British' were at times used interchangeably in the very same article. For this reason, I will not dwell on these distinctions any further.[766]

On the following pages, I will appraise the factors contributing to the formation of imagined communities, specifically in the case of Great Britain, and dwell briefly on the role technological achievements played in this context.

7.1 'Us' versus 'Them' – Imagined Communities and the Significant Other

Defining the nation as "an imagined political community,"[767] Anderson explains that "[i]t is *imagined* because the members of even the smallest nation will never know most of their fellow-members, meet them, or even hear of them, yet in the minds of each lives the image of their communion."[768] [italics in original] The nation – or any other community, for that matter[769] – is therefore held together by the mere belief they have something in common, be it cultural values, religion or ties to a particular territory.[770]
In the concept of Anna Triandafyllidou, who elaborates how national identities are based on a combination of what she calls inclusive and exclusive factors, this belief in certain unifying characteristics is part of the inclusive aspect. She furthermore highlights that for members of a group to develop a sense of community, it is sufficient to "share with one another more things in common than they share with outsiders."[771]
At the same time, it has become commonplace to stress the significance of precisely this outside other from which the particular community can differentiate itself and "against which the unity and homogeneity of the ingroup is tested"[772] (this being the exclusive aspect). In this context, Triandafyllidou introduces the notion of the 'significant others', which can appear in a wide range of forms – for instance in the shape of an internal

[766] Most interestingly, though, no reference to nineteenth-century transport and communication technologies as English or British achievements could be found in the *Scotsman*. No premature conclusions should be drawn, however, before other Scottish newspapers and magazines have been examined.
[767] Benedict Anderson, *Imagined Communities. Reflections on the Origins and Spread of Nationalism* (London: Verso, 1991), 6.
[768] Ibid.
[769] Originally, Anderson specifically addressed questions of nationalism; by now his concept is applied in many different contexts; Anatoliy Gruzd et alt., for instance, examine the social networking service Twitter as an imagined community; cf. Anatoliy Gruzd, Barry Wellman and Yuri Takhteyev, "Imagining Twitter as an Imagined Community," *American Behavioral Scientist* 55, no. 10 (2011):1294-1318.
[770] Cf. Anna Triandafyllidou, "National Identity and the 'Other'," *Ethnic and Racial Studies* 21, no. 4 (1998):597.
[771] Ibid., 598.
[772] Ibid.

ethnic minority or as a rival state – and which impact on the emergence and transformation of a nation's collective identity "by means of their 'threatening' presence."[773] In this connection, some of the alleged common features shared by the ingroup are deemed particularly significant in order to differentiate ingroup from outgroup and to demonstrate a feeling of belonging.

These elaborations are peculiarly interesting as regards Great Britain and the construction of British national identity. As Linda Colley has emphasized, Britishness was neither the product of an amalgamation of previously existing national or regional identities, nor did it supplant them.[774] Rather, it was an additional, superimposed identity (and a particularly good example of what Triandafyllidou means with 'relative value'),[775] based on the very fact that the English, Welsh and Scottish, despite all their differences, felt they had more in common with one another than they had with others.[776] In the case of Great Britain, the ties to a distinct territory are considered to have played a particularly prominent role concerning the creation of collective identity: its island position on the edge of Europe, the fact that its external borders were clearly circumscribed by the sea – in contrast to continental powers, whose borders had long been and still were subject to repeated changes – and the resulting feeling of seclusion from enemies contributed decisively to the feeling of distinction on the side of the islanders. Consequently, Smith considers a "sense of the 'uncrossable ring of sea' (...) the most potent of England's historic ethnoscapes" (an imagery that, as he points out, is most aptly captured in John of Gaunt's deathbed speech).[777] Moreover, seafaring and naval power were particularly significant both as means to safeguard British commercial and military interests in a European context as well as foundation of the British overseas empire; consequently, "[c]onfidence in their maritime prowess was crucial to British people's beliefs that they exercised a empire over the seas."[778]

[773] Ibid., 600.
[774] Cf. Colley, *Britons*, 6.
[775] Cf. Triandafyllidou, "National Identity and the 'Other'," 598.
[776] Colley highlights that she deliberately excluded Ireland as, for various reasons, "Ireland was never able or willing to play a satisfactory part in [the invention of Britishness]." Colley, *Britons*, 8.
[777] Anthony Smith, "'Set in the Silver Sea': English National Identity and European Integration," *Nations and Nationalism* 12, no. 3 (2006): 438. In his deathbed speech, John of Gaunt refers to England as "fortress built by Nature for herself / (…) / This precious stone set in the silver sea / Which serves it in the office of a wall / Or as a moat defensive to a house." *Richard II*, Act II, Scene II.
[778] Marshall, "Empire and British Identity," 45f.

When Linda Colley declares that the British defined themselves "in reaction to the Other beyond their shores,"[779] she alludes to two more aspects which need to be taken into account. One of these is the seemingly incessant conflict between France and Britain, which between the early eighteenth and the beginning of the nineteenth century found expression in a series of wars and culminated in the Battle of Waterloo in 1815. Colley emphasizes that in terms of the formation of a British imagined community, France therefore acted as a 'significant Other': the English, Welsh and Scottish conceived the Catholic opponent on the other side of the Channel as an omnipresent menacing 'Other' and therefore moved closer together under the umbrella of British identity, "[defining] themselves against the French as they imagined them to be, superstitious, militarist, decadent and unfree."[780]

Furthermore, the imperial dimension and its impact on the formation of British identity have been highlighted repeatedly. Here, it is again advisable to distinguish between internal and external factors. On the one hand, economic interconnections, tides of emigration and the resulting personal communication across continents, and literary works with imperial topics, just to name a few factors, were experiences shared by the English, the Welsh and the Scots alike. This collective experience brought about an overall imperial state of mind and served as a platform on which the distinctions between English, Welsh and Scottish identities could be overcome.[781] Accordingly, "imperial sentiment was genuinely British in is reach, sufficiently so to make it one of the defining characteristics of Britishness in the late nineteenth century."[782] At the same time, this common identity was strengthened by the fact that Britain's colonial possessions (specifically its colonies of occupation) and its informal empire represented yet further 'significant Others'. In this connection, Eastern possessions figured most prominently: as Edward Said in his monography on *Orientalism* (originally published in 1978) has pointed out, "[t]he Orient is not only adjacent to Europe," but

> is also the place of Europe's greatest and richest and oldest colonies, the source of its civilizations and languages, its cultural contestant, and one of its deepest and most

[779] Colley, *Britons*, 6.
[780] Ibid., 5.
[781] Cf. David Powell, *Nationhood and Identity. The British State since 1800* (London: I. B. Tauris, 2002), 113-116. Similar to Linda Colley, Powell points to the special role Ireland played in this context and therefore does not take it into consideration here. What is more, despite considering the imperial experience as a fundament of a British identity, he also mentions that the growing Scottish, Welsh and Irish emigrant communities in, for instance, the United States, Australia and New Zealand did in turn result in intensified feelings of nationalism in the respective parts of the United Kingdom. Cf. ibid., 114.
[782] Ibid., 117.

> recurring images of the Other. In addition, the Orient has helped to define Europe (or the West) as its contrasting image, idea, personality, experience.[783]

As Adas has shown, however, the parameters drawn upon by Western colonial powers in order to contrast themselves from non-European civilizations changed over the centuries: prior to the Industrial Revolution, religion was the fundament on which European self-perception and the alleged superiority vis-à-vis their non-Christian colonial possessions was based. Science began to gain a stronger foothold in public perception in the course of the eighteenth century. In particular Newton's findings loomed large, and accordingly "Europeans were confident that largely because of advances in the sciences they had surpassed all other civilizations, past or present."[784] In the course of the nineteenth century (in other words, at the heyday of British Empire), technology came to be viewed as the primary marker of human achievement and therefore represented the decisive dividing line between the ruling colonial powers of the time, on the one hand, and non-European civilizations, on the other. By no means were science and technology the only standards of comparison at that point in time; religion, for instance, was still a significant gauge, as were governmental systems and ethical codes, just to name a few.[785] Nonetheless, as Adas emphasizes, due to the objectivity seemingly inherent to science and technology, these were deemed most significant and

> colonial administrators and missionaries, travelers and social commentators increasingly stressed technological and scientific standards as the most reliable basis for comparisons between societies and civilizations. In an age when what were held to be 'scientific' proofs were increasingly demanded of those engaged in the study of natural history and social development, material achievement and anatomical measurements proved irresistible gauges of human capacity and worth.[786]

In light of Europe's proceeding industrialization and given the fact that science and technology had become central to European self-conception, it is hardly surprising that they – under the guise of the civilizing mission – served as a justification for imperial ambitions: in the phraseology of the time, it was the 'white man's burden' to employ the latest technological achievements to improve the living conditions of less industrialized cultures, so that they could participate in the march towards progress.[787]

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[783] Edward Said, *Orientalism* (London: Penguin, 2003), 1f.
[784] Adas, *Machines as the Measure of Men*, 74.
[785] Cf. ibid., 144.
[786] Ibid., 144.
[787] Cf. Bowler, *Invention of Progress*, 19.

Lara Kriegel's analysis of the ways in which India was represented in reporting on the Great Exhibition is a good example of how this belief in technology being the ultimate gauge manifested in contemporary publications. Kriegel illustrates that Indian products provoked both feelings of admiration and "ethnographic curiosity."[788] India was, on the one hand, considered a haven of oriental splendour and magnificence and was closely associated with the magical stories of the Arabian Nights. Furthermore, the artistry and craftsmanship displayed in the exhibits, such as muslin and chintz, was widely acknowledged. It was therefore admitted that – in this respect – they were superior to British artefacts. Kriegel, however, also demonstrates that this was only one side of the coin and that, at the same time, Indian exhibits and the tools with which they were produced were considered to indicate that the subcontinent's development had come to a halt a long time ago and that by now, it was devoid of any dynamics. In fact, India was deemed the cradle of civilizations, but more in the style of a museum than anything else: Indian produce was depicted as a "combination of antiquity and constancy."[789] In so doing, one could categorize Indian products as remnants of the past, rather than as serious competition to British commodities. Further, Indian modes of production were taken to reflect, in the words of Kriegel, "Oriental savagery, barbarity, backwardness, wastefulness, and even filth," [790] whereas Western manufacturing demonstrated dedication to utilitarianism and liberty. Overall, it was thus possible to maintain the notion of the "relative upper hand"[791] of industrialized Western cultures. What is more, Kriegel shows how the exhibits presented at the Great Exhibition and the corresponding narratives were employed to reinforce a multi-layered hierarchy: the seeming continuity displayed in the Indian exhibits distinguished the subcontinent from other non-European cultures (for instance, Egypt or West African civilizations), which in the eyes of British observers offered nothing but crude and unrefined handiworks or ruins. [792]

Following Adas' argument and Kingsley's example, I will first of all illustrate how the produce of non-Western cultures was represented in the reporting on nineteenth-century transport and communication technologies and the Great Exhibition, before I turn to

[788] Lara Kriegel, "Narrating the Subcontinent in 1851: India at the Crystal Palace," in *The Great Exhibition of 1851: New Interdisciplinary Essays*, ed. Louise Purbrick (Manchester: Manchester University Press, 2001), 158.
[789] Ibid.
[790] Ibid., 161.
[791] Said, *Orientalism*, 7.
[792] Cf. Kriegel, "Narrating the Subcontinent," 158.

their relevance in terms of British common identity and comparisons between European nations.

7.2 The Ornamental and the Useful – A Tale of Western Superiority

Two weeks after the official opening of the Great Exhibition, the *Times* publishes an article which, in the style of a guide book, informs readers about the exhibits of the various countries participating. In this context, it is first of all pointed out that

> [i]n no fairer or truer mirror can national characters be represented than in their industrial products. Other pictures may deceive, but this must tell the truth. The course of events, guided as it is by a higher power than man's, does not always illustrate the moral and social attributes of communities. Not so the fruits of labour – the quality and description of material which engross the toil, supply the demand, and engage the tastes and predilections of a people. These tell their story as faithfully as the actions or the physiognomy of an individual indicate his nature.[793]

The article then describes how Great Britain presents itself:

> Let us commence at home, and see what appearance this island of ours puts on at the peaceful *réunion* [*sic*] of nations, Is [*sic*] it Britannia, with her trident and plumed helmet and the lion recumbent at her feet, or John Bull's portly form, carrying weight in every limb, and determination, not unmingled with prejudice, from the crown of his broad-brimmed hat to the soles of his top-boots? Far otherwise. Some traces of those popular types of our nationality may be traced, but England has greatly changed. Her genius is mechanism, her master spirit the civil engineer, her tendencies to relieve labour from its drudgery, and delegate to iron, to steam, and to the other powers of the inanimate world as much as possible of the burden of toil.[794]

Accordingly, the conclusion is drawn that "[i]n our manufactures the mechanical genius of the country reigns supreme."[795] Subsequently, the readers' attention is drawn to the contributions of "our empire in the East," which were also exhibited in the British section. The Indian collection, which, as the article points out, consists of "filagree [*sic*] work in silver and gold, brocaded stuffs, curiously executed carvings, rude models of machinery,"[796] is described as follows:

> Here are gathered together the trophies of ancient civilization and arts, marvellously carried down to our own time. Here may be studied the industrial habit of nations preserved through centuries without change or progress, yet still wonderful and magnificent in the eyes of modern labour. (…) Nearly everything in that collection

[793] "The Great Exhibition," *The Times*, 15 May 1851, 5.
[794] Ibid.
[795] Ibid.
[796] Ibid.

> which is the work of a man's hand indicates a vast expenditure of time for its production and a great display of taste.[797]

In the eyes of British observers, however, the major drawback to Indian produce is what is perceived to be lack of usefulness:

> Yet it is nearly all ornamental rather than useful, in its character. Whenever the really useful arts appear rudeness of material and design are visible. A warlike weapon will be finished off in the most elaborate style, yet a pair of scissors be manufactured in a manner worthy of the South Sea Islanders. The East India Company begin their rule of India as if it were a new country. The evidences of barbaric pomp, the State umbrellas, the cloth of gold, and robes decorated with pearls and diamonds, concern not them. These belong to the natives, to the traditions of the past, and to industries which have been bequeathed from age to age as an heirloom.[798]

Consequently, the conclusion is drawn that

> [o]ur part of the collection is the raw produce – the mineral, vegetable, and animal treasures undiscovered and unused till our commerce and the wants of our manufactures sought them out. Resting upon them, we strive to build on substantial and permanent foundations the structure of empire and government in India; at least, that is the lesson which the Exhibition seems to teach (….). Such is a brief and imperfect outline of what we conceive to be the character and inward meaning of the vast mass of objects which have been collected within the British half of the Crystal Palace.[799]

This article is particularly noteworthy as it illustrates a variety of things:[800] To start with (and in accordance with Adas' elaborations), the article stresses the significance of technology and industrial production in the sense that they are not only deemed the ultimate gauge of a country's progressiveness, but are also considered to give some indication of its national character. Britain is depicted as a progressive and civilized country which, owing to its competence in the fields of civil engineering and mechanics, has been able to change 'greatly' and, in so doing, has managed to overcome hardship and toil. India and other non-European countries,[801] on the other hand, are reduced to their ornamental and handicraft skills: these bear witness to an ancient past, but are of no 'real' use in the nineteenth century. They are thus considered proof that the subcontinent's development has come to a standstill a long time ago. This, in turn, is taken as a justification for Britain's imperial efforts in India.

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[797] Ibid.
[798] Ibid.
[799] Ibid.
[800] Interestingly, the article does not differentiate between Britain and England, which supports the assumption they were used interchangeably.
[801] Such as Tunisia, whose exhibits are, similar to those of India, described as "rich mule trappings, gaudy brocaded costumes (…) carpets, marvels of tasteful design." Ibid.

In "The General Bearing of the Great Exhibition," it becomes peculiarly manifest how exhibits were drawn upon in order to establish hierarchical rankings. Similar to the above-quoted article from the *Times*, the "General Bearing" specifies the exhibits from different countries and compares them with one another. To start with, products from various island peoples from the Indian Ocean are presented:

> From Labuan, the last specimen of savage life with which this country has become connected, we have also clothes and armour, weapons and musical instruments. From all the wide domains which lie within or around our Indian Empire we have rich and various contributions; from Sincapore and Ceylon, Celebes and Java, Mengatal and Palembang. The ruder and more primitive of these regions send us their native food and clothing, their fishing nets and baskets.[802]

It is also pointed out, though, that "art soon goes beyond these first essays. From Sumatra we have the loom and the plough, lacquered work and silken wares."[803] In contrast to the contributions mentioned above, those from the Indian subcontinent – "so long the field of a peculiar form of civilization"[804] – are portrayed as "treasures of skill and ingenuity, of magnificence and beauty."[805] Again, it is the decorativeness and ornamental value of these artefacts that is being emphasized:

> And when we come to the higher stages of cultured art – to the works of nations long civilized, though inferior to ourselves, it may be, in progressive civilization and mechanical power, how much do we find in their works which we must admire, which we might envy, which, indeed, might drive us to despair! Even still, the tissues and ornamental works of Persia and of India have beauties which we, with all our appliances and means, cannot surpass. The gorgeous East showers its barbaric pearl and gold into its magnificent textures.[806]

In consequence, the conclusion is drawn that "*Oriental* magnificence is still a proverbial mode of describing a degree of splendour and artistical richness which is not found among ourselves."[807] [italics in original] The question is then raised if and to what extent Great Britain can overall still be considered more advanced. Already previously, though, readers have been told that "in advancing from [the products of extra-European civilizations] to the productions of our own form of civilization (…), we advance also to a more skilful, powerful, comprehensive and progressive form of art."[808] At this later point, it is once more emphasized that

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[802] William Whewell, "The General Bearing of the Great Exhibition on the Progress of Art and Science," in *Lectures on the Results of the Great Exhibition of 1851* (London: David Bogue, 1852), 15f.
[803] Ibid., 16.
[804] Ibid.
[805] Ibid.
[806] Ibid, 17.
[807] Ibid.
[808] Ibid., 16.

> [s]urely our imagined superiority is not all imaginary; surely we really are more advanced than they, and this term 'advanced' has a meaning; surely that mighty thought of a PROGRESS [*sic*] in the life of nations is not an empty dream; and surely our progress has carried us beyond them.[809]

The reason for such differences between peoples "in a condition of nearly stationary civilization, like Oriental nations, and nations which have felt the full influence of progress like ourselves,"[810] is considered to be the fact that

> in those countries the arts are mainly exercised to gratify the tastes of the few; with us, to supply the wants of the many. There, the wealth of a province is absorbed in the dress of a mighty warrior; here, the gigantic weapons of the peaceful potentate are used to provide clothing for the world.[811]

In line with what Kriegel has shown (and in accordance with what has been illustrated in Chapter 4), it is again pointed out that, firstly, India is not developing any further, but is at a standstill in the past, and secondly, that it is not only the sheer ability to construct a certain machine or to manufacture a particular product, but also the extent to which the population at large can benefit from any invention, which is considered decisive. In the eyes of British contemporaries, India, despite all its astonishing and beautifully crafted products, must therefore remain inferior to Great Britain, which is characterized by dynamism and progress.

In an Exhibition Supplement to the *Illustrated London News*, the seeming lack of development is also mentioned. Here, the reader's attention is drawn to a "variety of models of the mills, gins, and other works used in the preparation and manufacture of the cotton plant."[812] These are considered to be

> primitive contrivances of the rudest class, to which, we are sorry to believe, few or no additions or improvements have been made for centuries, showing how much remains yet to be done, when the light of civilisation shall have made its genial influence felt by our oriental brethren.[813]

Similar reporting can also be found in the *Liverpool Mercury*. To start with, the article emphasizes that other countries are superior to Britain in terms of the decorative character of their products:

> The attention paid to all these matters abroad, as compared with this country, is now daily and hourly felt, and lamented by our own manufacturers, who have certainly been

[809] Ibid., 18.
[810] Ibid.
[811] Ibid., 18.
[812] "The East Indian Courts," Exhibition Supplement, *Illustrated London News*, 14 June 1851, 563.
[813] Ibid.

> making great efforts of late to bring up their leeway, and to approach nearer to the best standards of continental taste.[814]

It is further pointed out that

> while other countries have been studying chiefly to render their industrial products artistic, we have been struggling to render ours cheap and serviceable; and if it be a question whether they have not gone too far in the one direction, it cannot be doubted that we have been too exclusively bent upon the other. But it is not the great European communities that alone teach us a lesson in this respect – for we cannot approach the carpets and rugs of Turkey, Tunis, India, and other countries, far behind us as they are in general civilization.[815]

The conclusion is thus drawn that

> if England wishes to maintain her position and character in the industrial world, she must cultivate more closely than hitherto not so much the fine arts, *per se*, as the practical application of them to useful objects.[816]

Subsequently, however, it is pointed out that, in other respects, Britain is still way ahead of its competitors:

> And now let us briefly indicate some of the points on which, from the opportunities of comparison which the Exhibition affords, we are justified in thinking that foreign nations may learn something from us. They will find the unmistakeable proofs of a strong and sturdy system of industry adjusted to a broad utilitarian standard. Whatever enters largely into the demand of the consumer, and is indispensable to the subsistence or comfort of the masses, attracts to its production the largest amount of energy, capital, and skill. In order to manufacture cheaply, we have organised an immense and complicated body of machinery, which spins and weaves, and forges and turns iron, and asserts an almost unbounded supremacy over the materials which enter into the use of mankind for clothing, for labour or defence, for household purposes, for locomotion, and for instruction (…). Paisley shawls, Kidderminster carpets, and Nottingham lace, will not stand, respectively, a comparison with those of Cashmere, Aubusson, or Valenciennes; but the difference of prices more than restores the balance of commercial value. [817]

Finally, the multifarious improvements obtained in the field of transport technologies are listed:

> In locomotion we have organised a stupendous system, both by land and sea, for the wants of an ever-extending traffic, and the illustrations which are produced in the Exhibition of that system are full not only of the evidences of past success, but also of the indications of future progress. Not to speak of new descriptions of permanent way, new constructions of carriages, new distributions of weight and strain in locomotives, greater economy of space, and more direct action in marine engines, there are hitherto

[814] "The Great Exhibition," *Liverpool Mercury*, 10 June 1851, 3.
[815] Ibid.
[816] Ibid.
[817] Ibid.

> unattempted methods of propulsion exemplified by models, among which are included aërial machines and a plan for the substitution of the electro-magnetic power for steam.[818]

In conclusion, readers are told that "in all the leading departments of industry the aim of England is still to produce for the masses, to consult utility, and to insure, as far as in her lies, the elements of cheapness and good quality."[819]

An article published in the *Illustrated London News* is particularly noteworthy in that it initially stresses the unifying aspects of science and technology:

> The civilisation of Europe, so far as it depends on religion and science, is, to a great extent, common. If it vary in degree in different countries, it has gone, or is going, through nearly the same phases in all. The sciences of astronomy, geology, and chemistry, for example, and the arts connected with them such as navigation, mining, dyeing, smelting, &c., are common to all the nations of Europe. All the arts of life are founded on some principles common to the whole human race, and are practised in a similar manner. From science being everywhere the same, we draw the inference that the minds of all men are somewhat alike. (…) There are not two astronomies, two mathematics, or two chemistries – one for England and another for Italy; there are not separate sciences for every distinct country, but only one science for all. This similarity of uniformity of knowledge constitutes the true brotherhood of mankind.[820]

It is furthermore pointed out that the Exhibition

> has especially made evident and palpable to all the universal prevalence of a common industry, directed to similar purposes, and guided by similar rules. The differences between the productions of China and France, of Hindostan and the United States, are not so remarkable to reflecting minds as their similarity. Not only similar arts exist in the most distant countries, but similar inventions have taken place; and – not to speak of the art – of making paper, earthenware, and ships, gunpowder, printing, and bank-notes have all been invented in China as in Europe.[821]

Contrary to previous reporting, the article initially makes no mention of the alleged backwardness of other civilizations. Instead, it emphasizes the similarities between different cultures concerning scientific and technological developments. Consequently, it is anticipated that

> the Exhibition (…) will be of political value. It proclaims as a great truth, that no legislation can be durable, no statesmanship beneficial, which does not fall in, like the Exhibition itself, with the general progress towards acknowledging and promoting a common brotherhood. By showing us that all art is founded on common principles, and on sciences common to all, it impresses on us the important truth, that we shall be

[818] Ibid.
[819] Ibid.
[820] "The Great Exhibition," Exhibition Supplement, *Illustrated London News*, 6 September 1851, 290.
[821] Ibid.

> powerful, wise, and happy not as we gain victories over each other, but in proportion as we comprehend that external cause to which all science relates.[822]

Subsequently, however, the article also refers to the afore-mentioned juxtaposition of useful and decorative exhibits:

> A great part of the Exhibition consists of luxuries and ornaments – of jewels for the few, rather than of bread for the multitude; but it contains also working models of powerful and valuable machines. Bringing the two together, forces on the mind at once a comparison and a contrast between the merely ornamental and the useful arts. A steam-engine and the Koh-i-noor are placed before us, and we are called on to choose between them. An improved Jacquard loom, or a power-loom that appears instinct with life, or a printing press, arrests attention as well as the sculpture in the Nave and the glittering works in the French department.[823]

Finally, however, it is once more the utility of British products and the notion that they cater to the needs of the masses that are considered proof of their superiority (and, in line with what has been shown in chapter 4, distinguish the nineteenth century from earlier times).

> As the rule, we may say that the useful arts are the handmaids of the multitude; the ornamental arts, of the few. The former (…) are much more rapidly and certainly improved than the latter. Accordingly, while our journals teem with numerous and loud complaints of a general want of taste – of the ornamental arts being neither understood nor appreciated – only admiration is felt for our wonderful mechanical contrivances. The ornamental arts, subserving chiefly the pleasure of the few, have in them something conservative, and they change less and are improved less than the useful arts. In sculpture we are still proud to imitate the Greeks, and rarely hope to attain perfection. In painting we do not surpass the Italians of the Middle Ages. Our carving is, perhaps, less skilful than that of the Chinese; and few of our silversmiths reach the excellence of Benvenuto Cellini. The colours of our garments, their shape and texture, and the ornaments of our houses, are about equal to those of the Hindoos and the Romans. But our power-looms, railroads, locomotives, spinning-mules, telegraphs, tubular bridges, &c., far beyond anything the people of antiquity ever dreamed of, are the pride of this generation. They are our own invention, and we deem them much more worthy than the products of arts we have inherited from the rude nations of antiquity. It may be suspected, therefore, that the superiority sometimes assigned to the ornamental and fine arts is more due to their gratifying the tastes of a few, and to an inherited reverence for them, so far as this generation is concerned, than to their intrinsic worth.[824]

A few weeks before the closing of the Great Exhibition, the *Times* comments similarly. Concerning the awarding of medals it is highlighted that most attention has been paid to ornamental and decorative artefacts, such as "rich brocades, splendid carpets, glowing

[822] Ibid.
[823] Ibid.
[824] Ibid.

tapestry, and all that tends to embellish and adorn life."[825] It is further remarked that "the captivating luxuries which are adapted to the few have entered more largely into our imaginations and our hearts than those objects which are adapted to supply the homely comforts and the unpretending wants of the many."[826] The inferiority of British products in terms of design and embellishment is readily acknowledged, for "[t]here cannot be a question that the results of the Exhibition have demonstrated in the clearest manner our backwardness in the higher and more artistic branches of manufactures."[827] Subsequently, however, it is emphasized that this only plays a secondary role, for there are

> matters that touch us more nearly than even the true principles of colour and form, and of these the most prominent are such as affect our position as caterers for the demand of the million, as manufacturers of cheap and useful commodities adapted to the wants of the masses all over the world. [828]

These accounts of the products exhibited at the Great Exhibition therefore already illustrate, firstly, the extent to which material products and national culture were considered to be correlated, and secondly, to what extent this relation was drawn upon in order to construct and perpetuate hierarchical rankings.

As has been pointed to before, Adas shows how scientific and technological superiority served as the foundations of the civilizing mission, adding a moral element to the otherwise economic and geopolitical motifs behind imperialist efforts.[829] It is therefore hardly surprising that in accordance with the accounts of the Great Exhibition, this line of argument is also taken up in *Poles, Wires and Cables*, which elaborates the way electric telegraphy can be made use of in an imperial context. Here, it is pointed out that

> in our communication with India, China and Japan, the Electric Telegraph will be not merely a commercial and political, but a *Religious Auxiliary!* [*sic*] It will afford another means of disseminating the Bible, of aiding the labours of the Missionary, of making Christianity known among the heathen. (…) [A] great means of promoting Christianity is now placed in your hands, almost as if in acknowledgement of your efforts to promote it.[830]

It is furthermore pointed out that

> Persia, India, China and Japan require to be brought into closer communion with Christian nations. These are the countries in which we have our work to do. Hundreds

[825] "The Great Exhibition," *The Times*, 20 September 1851, 5.
[826] Ibid.
[827] Ibid.
[828] Ibid.
[829] Cf. Adas, *Machines as the Measure of Men*, 199-221.
[830] *Poles, Wires, and Cables*, 43.

> of millions of souls are to be saved in those Empires. And the Telegraph, above all other means, will assist our efforts, by bringing them close home to us.[831]

Moreover, the application of the electric telegraph as a tool in the civilizing mission is considered further proof of Western civilizations' progressiveness and superiority over extra-European and non-Christian peoples: whereas "Mahomet proposed to work out his religion by the sword: a cruel and destructive instrument,"

> [t]he followers of Christ work out their principles with the Bible: an intellectual and civilizing means. But to teach the great truths of Christianity by means of its Great Book requires time, opportunity and perseverance. The Telegraph, as an aid to the Bible, will annihilate time, open up opportunity, and afford to perseverance that encouragement without which it too frequently becomes dejected despondent.[832]

7.3 Transport and Communication Technologies: National Identity, International Rivalry

In the publications under review, science and technology were not only used to point up Western civilization's alleged superiority over Eastern cultures, though. They were also drawn upon in terms of the creation of British national identity and served as a gauge by means of which European countries could be categorized. In the above-quoted *Poles, Wires and Cables*, for instance, it is vehemently emphasized that

> [the] Electric Telegraph belongs to ENGLAND. [*sic*] This wonderful invention of Cooke and Wheatstone was originated, developed, and carried through all its details and difficulties in England. It belongs, peculiarly, to English science, to English enterprise, to English perseverance, and to English men; and England and her people may well be proud of it.[833]

Similarly, the *Observer*, reporting the attempt of laying a transatlantic submarine cable in 1865, points to specific qualities without which this task could not have been carried out successfully:

> If Englishmen were much less famous than they are for perseverance and tenacity of purpose there would be no reason to suppose that the check they have received in their second great attempt to effect telegraphic communication between the shores of Ireland and Newfoundland would lead to the problem being thrown aside, as too difficult of solution, in our present state of mechanical and scientific knowledge. Were the project much less hopeful we should rely confidently on that indomitable determination

[831] Ibid., 44.
[832] Ibid.
[833] *Poles, Wires, and Cables*, 5.

> inherent in the national character for continued effort, until the great and crowning triumph of complete success made ample amends for previous failures.[834]

In the run-up to the *Great Eastern'*s maiden voyage, the *Illustrated London News* in a similar manner points out that the ship "is not only the greatest national wonder of our age, but the noblest single proof of the scientific genius of our country" and further considers her a "marvel of shipbuilding and engineering skill, and the one pre-eminent triumph of British enterprise and perseverance."[835] All of these passages thus make mention of seemingly typically English / British qualities which were deemed necessary in order to fulfil the specific task – accordingly, no other country could have succeeded in carrying out these projects.

Hardly surprisingly, it is particularly in the reporting on the *Great Eastern* steamship that the significance of Britain's island position, on the one hand, and the sea and seafaring, on the other, in the context of British self-conception comes to the fore. The *Illustrated London News* considers the ship a "magnificent floating railway to Calcutta on our own peculiar element."[836] In *The Great Eastern Steam Ship* it is pointed out that she is "the most magnificent creation of naval architecture that the world has ever seen, and a characteristic monument of the genius of England and the glory of her prodigious commerce."[837] In *The Visitors' Guide to the Great Eastern*, it is highlighted that

> [t]o us as a maritime people, the construction of ships, both for war and commerce, has been naturally an object of peculiar interest and vast importance; and in that direction art and science combined seem to have wrought extraordinary results. The geographical position of our island-home would make us an isolated people but for our taste and aptitude for the navigation of the waters.[838]

It is furthermore pointed out that, as a result,

> Englishmen are justly proud of their maritime supremacy. Our insular position has rendered this supremacy of the highest importance to us; on it has depended our very existence as a nation, and there is therefore singular propriety in our speaking of our ships as 'wooden walls,' and as the 'bulwarks of the deep.'[839]

What is more, the *Great Eastern* is embedded in Anglo-Saxon history. Referring to the long-standing tradition of seafaring, on the one hand, and the military, political and

[834] "The Atlantic Telegraph Cable," *The Observer*, 27 August 1865, 5.
[835] "The 'Big Ship'," *Illustrated London News,* 13 August 1859, 148.
[836] Ibid.
[837] *Great Eastern Steam Ship*, 3.
[838] Jackson, *Visitor' s Guide to the Great Eastern*, 8.
[839] Ibid.

commercial achievements resulting from it, on the other, the notion of English maritime supremacy is reinforced:

> Our naval history is replete with great victories, and lustrous with the names of the great naval heroes. Our ancestors asserted their hereditary right to the sovereignty of the seas, and that claim was completely established by our naval achievements. In the time of war our fleets have been unrivalled, they have guarded our own shore from invasion, and blockaded the ports of our enemies; they have extended our empire and consolidated our power. In time of peace, our merchant army has been equally serviceable, enabling us to establish commercial relations with all nations, to lay the foundations of flourishing colonies, to open up new marts for commerce, and to increase our trade beyond all precedent. Hence the art of ship-building is so intimately connected with the progress of mercantile pursuits, the chief characteristics of our race, that we naturally feel deeply interested in its advance.[840]

In comparison with previous steamships, such as the *Comet*, the *Great Western* or the *Persia*, contemporary ships resemble "floating palaces" and observers may "be overwhelmed with wonder at the progress which British skills, wealth, and energy have effected in so brief a period."[841] The *Great Eastern* is therefore considered the "last specimen of our modern naval architecture" and "a characteristic monument of the genius of England and the glory of her prodigious commerce."[842] (What is more, the article makes mention of both the genius of *England* and of *British* skills; this is yet another indication that the two were used interchangeably.)

Furthermore, the sea as a defining feature of British national identity is also mentioned in connection with other technological achievements. In the context of the laying of the 1858 transatlantic cable, the *Illustrated London News* remarks that there can be little doubt "not only that we shall speedily have telegraphic communication with India and China, but that such communication will be made through our own national domain and peculiar property – the Sea."[843]

As has been seen, in the eyes of British contemporaries, transport and communication technologies represented what was deemed typically English / British qualities, such as tenacity, perseverance, and determination. On this basis, comparisons with other European countries are drawn. Concerning the planning and organization of the Great Exhibition, it is asserted that there is "no other country under the sun from which the invitation to the nations of the world to exhibit productions of their industry could have

[840] Ibid.
[841] Ibid., 9.
[842] Ibid., 10.
[843] "Our Readers Will not Think," *Illustrated London News*, 21 August 1858, 168.

proceeded with so much grace and propriety as England."[844] In this context, Britain's role in the formation of global transport and communication networks is emphasized:

> With the exception of the United States of America, no other country has sought to imitate, far less to rival, the efforts of England to establish regular and rapid communication between all parts of the globe. Had any of our continental neighbours issued such an invitation, it must have been borne to the ends of the earth in English steamers, and visitors would have voyaged to it in ships sailing under the English flag. The mighty task of bringing all the nations of the world nearer and closer to each other has been, as if by tacit consent, left to be accomplished by English skill, ingenuity, and enterprise; and as by us the pathless tracks of ocean have been converted into grand highways for 'joining the countries they divide,' so the terminus of all these great highways has been, without dispute, selected as the most fitting place for the exhibition of the world's industry.[845]

As has been alluded to by Hempstead and as indicated in this passage, nineteenth-century reporting on transport and communication technologies bears witness to a growing rivalry between Great Britain and the United States.[846] Further evidence of this can be found in other publications. In an article on the 1858 cable – "sentimentally called the Wedding-ring between England and the United States"[847] – *Lloyd's Weekly Newspaper* dwells on the assumption that Americans claim the success of laying a transatlantic cable for themselves. Readers are therefore reminded that the magazine has earlier expressed

> a sincere hope that the wire lying upon the bed of the great ocean would be a bond of good-fellowship between the two great Anglo-Saxon nations. We were far from anticipating that ungenerous and unfair view of this gigantic enterprise which the Yankees have adopted. We were not prepared for that endeavour to put England aside which the glorifiers of Mr. Field have made in all their speeches and demonstrations.[848]

The article further points to Britain's contribution to the endeavour:

> We knew that Englishmen planned the laying of the cable; that the vast outlay necessary to carry out the plan was furnished almost entirely in this country; that the wire was actually manufactured in England; that the paying-out machines came from British factories; and that the scientific gentlemen who paid out the cable, and, in fact, did all the hazardous work, were subjects of the Queen.[849]

Americans, on the other hand, are blamed of boastfulness and arrogance:

> Yankees travelling in England have prepared us, by their habit of boasting, and by their depreciation of everything not native to the States, for the great dishonesty of which

[844] "The World's Highway to the World's Exhibition," Exhibition Supplement, *Illustrated London News*, 31 May 1851, 496.
[845] Ibid.
[846] Cf. Hempstead, "Representations of Transatlantic Telegraphy," 25.
[847] "The Atlantic Wedding-Ring," *Lloyd's Weekly Newspaper*, 5 September 1858, 6.
[848] Ibid.
[849] Ibid.

> they have been lately guilty. Men, whose vision is bounded by their own country, or their own parish – who can allow no peppercorn of praise to a thing which is not theirs – gradually fall into a habit of self-laudation, and of detraction from others, that ripens into deliberate falsity. (...) With Americans, it is impossible for any city in Europe to bear a comparison with New York. English manners are not bad – but Yankee manners are better. The French cook cleverly, but did you ever dine in a first-rate Yankee hotel? And now, the part taken by England in the laying of the Atlantic cable, is not worth mentioning, when it is compared with the genius and enterprise shown by Brother Jonathan in the same undertaking! [850]

A few days after the cable ceased functioning, *Lloyd's Weekly Newspaper* contemplates the reasons for this failure and – in a somewhat dismissive tone – suggests that

> the Atlantic Telegraph was so moved, so tickled with the absurd braggadocio of Brother Jonathan in assuming all the glory of laying it to himself, that it could not help laughing; and it laughed so immoderately over Yankee Doodle's amusing conceit that it fairly split its sides by laughing. Brother Jonathan should not try his powers of exciting laughter too much. The Atlantic Telegraph is a victim to it.[851]

The *Liverpool Mercury* also points to how Americans disregard the role Britain played in the laying of the transatlantic cable:

> Most of our readers must have noticed with regret the eagerness of American orators to appropriate to their own country and their own countrymen the whole glory of an undertaking in which British enterprise, skill, science, and daring bore at least an equal share. It is remarkable that, throughout the New York festivities, the name of Sir Charles Bright, the chief engineer to the Atlantic Telegraph Company, was barely mentioned. This exorbitant self-exaggeration on the part of American patriots is neither an amiable nor a creditable trait; and though it would be inconceivably petty to resent such puerilities seriously, we may be pardoned for hinting that difficulty and disappointment are the divinely-ordained correctives for vanity and presumption.[852]

The conclusion is thus drawn that "when this grand enterprise is crowned with final and enduring success, its moral value as regards the relations of the two countries will be enhanced by the previous rebuke to national self-conceit."[853] The reporting on the 1858 transatlantic cable can therefore be said to have served as an arena for interstate rivalries between Britain and the US.

Further, the representation of French technological achievements is worthy of attention: As has been illustrated in the beginning, both the *Times* articles published shortly after the inauguration of the Great Exhibition and the publication on its "General Bearing" highlight the usefulness of British exhibits and point to the fact that, by means of these

[850] Ibid.
[851] "Why the Atlantic Telegraph Broke," *Lloyd's Weekly Newspaper,* 19 September 1858, 6.
[852] "The Americans and the Atlantic Telegraph," *Liverpool Mercury*, 24 September 1858, 6.
[853] Ibid.

products, the "wants of the many" can be relieved. In contrast, the exhibits presented in the French section are considered to be of a different nature: "From Italy we enter France – and what do we find there? Not the mechanical genius of England, not its utilitarian tendencies – not a manufacturing system founded on the supply of the masses."[854] It is indeed acknowledged that the French are not "altogether neglectful of these" for "[t]hey exhibit a considerable amount of machinery, and a large portion of their products touch, if not upon the actual necessities, at least upon the wants, the comforts, and the small luxuries of the million."[855] Despite such efforts to do justice to the necessities of the population at large, though, French products cater mostly to the needs of the more affluent social strata:

> Then they rise from the embellishment of the cottage to that of the palace. They show that Kings and Queens are their customers. Their bronzes, their lamps and chandeliers and candelabra, their ornamental furniture, their cambrics, their shawls, and their silks – all these things are with them works of art rather than products of industry. They neglect not the demands of trade; yet they aspire to purity of design and make it their chief glory.[856]

In conclusion, however, it is pointed out that "[f]rom their collection we have much to learn, and they will likewise be instructed by ours. Both countries will see that their industrial tendencies do not clash, and that each is free to pursue a distinct course and to fulfil peaceably an independent destiny."[857]

Elsewhere, though, it is emphasized that Britain is way ahead of France in the implementation of large technological projects. As has been illustrated, Britain's effectiveness in this respect is deemed to be due to certain national characteristics that distinguish the British from other nations. Concerning the laying of the 1866 trans-atlantic cable, it is consequently pointed out that

> [o]ur neighbours (…) have liberally admitted in their accounts of the laying of the Atlantic cable that it was an enterprise which only English genius and English pluck could possibly carry to a successful issue. They admit that Frenchmen would have been discomfited at all events by the second, if not by the first failure; and they are pleased to compliment us on our bull-dog tenacity.[858]

It is particularly Britain's "commercial enterprise" – to which "no small part of the glory connected with the Atlantic Cable is due" and which France seems to lack – that is emphasized:

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[854] "The Great Exhibition," *The Times*, 15 May 1851, 5.
[855] Ibid.
[856] Ibid.
[857] Ibid.
[858] "The Atlantic Cable," *Lloyd's Weekly Newspaper*, 5 August 1866, 1.

> On the failure of the second Atlantic cable there were not wanting evil prophets and witless and irreverent revilers who declared that it was not possible, in the present condition of science, or with the existing resources of mechanical arts, to connect England and America by an electric wire. Enough money, it was said, had been wasted. In France such arguments would have prevailed.[859]

Rivalries between France and Britain became particularly visible in reporting on the Suez Canal. Admittedly, as has been shown earlier, the various publications did at least occasionally wax lyrical about the waterway connecting the Mediterranean with the Red Sea. Both the fact that the canal was a project largely under the auspices of France and the circumstance that British statesmen and engineers had previously presented numerous arguments against it, are mostly disregarded in this context, though. The *Illustrated London News'* reporting in the aftermath of the canal's inauguration, however, is an exception. The article declares that the canal will make "a vast addition to the material resources of mankind."[860] Accordingly, the attitude previously displayed by the British political elite is criticized:

> England, we fear, cannot take any great share of the credit due to the realisation of this great project. Whilst it was yet in its initiatory stage she looked upon it doubtingly and coldly, and her most popular statesman and her foremost engineer concurred in speaking discouraging things concerning it.[861]

The lesson learnt must therefore be that

> [f]or the future, we trust she will contemplate vast enterprises undertaken by men of other nations for the common good with an eye to their merits as well as to their demerits, and, if she cannot assist, will carefully abstain from proceedings calculated to impede. True patriotism does not require that we should depreciate the abilities of other countries in any department of thought or action, and that patriotism which is but an enlarged expression of self-conceit is spurious.[862]

Previously, however, it has been pointed out that Ferdinand de Lesseps was able to carry out this project successfully primarily because he was endowed with some of the seemingly typically British characteristics:

> All this required, in no ordinary degree, genius, faith, self-reliance, enthusiasm, patience, perseverance, and an indomitable will, and in M. De Lesseps all these qualities were combined. (…) The central fire which burned brightly in his own heart made its warmth felt throughout the whole organisation which his genius had constructed and adapted to give practical effect to his ideas and plans. In him were happily associated the quick perception, the vivacity, and the impetuous dash of the French temperament, with the

[859] Ibid.
[860] "Opening of the Suez Canal," *Illustrated London News*, 27 November 1869, 526.
[861] Ibid.
[862] Ibid.

> imperturbable resolution, the dogged pertinacity, and, we may add, the obstinate persistency of the Anglo-Saxon.[863]

Elsewhere, however, the significance of the Suez Canal as both a technological achievement in general and a potential threat to British supremacy in the East in particular is played down, the impact it might potentially have on global flows of goods, people and information being trivialized. Already nine months before the official inauguration, the *Times* asserts that

> [i]f we in this country believed the Suez Canal was 'a sword to pierce the breastplate of England,' it was because Frenchmen told us so. How this British breastplate was supposed to be worn, and how the French sword was to pierce it, were mysteries which we ourselves could never rightly fathom.[864]

Therefore the conclusion is drawn that the canal is "simply a waterway between two great seas - a short cut from the Western to the Eastern World, and that is all."[865] Moreover, the canal's value as a piece of engineering work is belittled:

> As a piece of engineering the Suez Canal was not only never an impossibility, but never even so much as a difficulty. The works themselves happen to be peculiarly simple, while the soil is favourable instead of unfavourable to their execution. The burden of the task consisted in its prodigious magnitude, aggravated by the effects of the climate, and, above all, by the want of fresh water; otherwise, far greater mechanical feats have been done in Egypt itself, to say nothing of other countries.[866]

A few months later, the *Times* furthermore points out that the Pacific Railroad, which has just been completed, is a considerably more complex and significant piece of engineering work than the canal: "If the present year should also witness the completion of the Suez Canal, it will indeed be a singular coincidence, but even the cutting of the Isthmus is a less wonderful exploit than this Pacific Railroad."[867] In a similar manner, the *Manchester Guardian* points out that from a engineering point of view, the canal is by no means a noteworthy project:

> The achievement is not quite so much opposed to previous prediction as was that of railways in practical working or the steam navigation of the Atlantic. Nobody ever said that it was impossible to cut a ditch of any given length, depth, and breadth through the sands of Egypt. Clearly to do so was only a matter of money.[868]

Nonetheless, it is subsequently pointed out that one should "acknowledge in the performance of this feat of engineering energy a splendid triumph of genius and

[863] Ibid., 525.
[864] "Taken Altogether," *The Times*, 18 February 1869, 9.
[865] Ibid.
[866] Ibid.
[867] "A Telegram From our American Correspondent," *The Times*, 10 May 1869, 8.
[868] "Daring and Pertinacity," *Manchester Guardian,* 20 November 1869, 4.

perseverance."[869] A few days later, though, it is once more emphasized that the canal is no match for other technological projects:

> Greater feats of engineering have been executed on many a line of railway at home and abroad than any that have tasked the ingenuity of the Canal Company's staff. Indeed, the peculiar glory of M. De Lesseps is to have proved that the physical obstacles to the cutting of the canal were greatly over-rated [*sic*], and that with time and money it was quite possible to dig a trench from sea to sea and keep it open by perpetual dredging.[870]

Subsequently, it is speculated that

> [p]ossibly the money would never have been forthcoming had not Lord Palmerston's criticisms on the project aroused the national vanity of the French people, and led them to believe that in taking the Canal Company's shares they were helping to secure the predominance of French ideas and French interests in Egypt. They accepted with characteristic ardour what they regarded as the challenge of the English Minister.[871]

With the canal now being inaugurated, "it must in candour be owned that they have fairly beaten us. (…) It will be said that at least we know how to bear a defeat with a good grace."[872] If this is really the case, though, is questionable, as the following passage suggests:

> Perhaps we still secretly console ourselves with the belief that the grand object which the projectors of the canal had in view will never be attained; that, in an age in which no country that has not abundant stores of coal and iron, and skill in working them, can aspire to commercial greatness, any improvement of communication by sea must tend to our advantage more than to that of any other nation: and that, even should the canal supersede not only the Cape route, but the Egyptian railway, the prospect of a revolution which should change the whole course of trade, and re-transfer to the countries surrounding the basin of the Mediterranean their long-lost maritime supremacy, is as visionary as Napoleon's dream of re-establishing a Latin empire in the New World.[873]

Both the reporting on American reactions to the completion of the transatlantic cable, on the one hand, and on French projects and products, on the other, demonstrate that at the time, technological achievements were considered to be an embodiment of certain national characteristics and were drawn upon for the creation of national identities. What is more, coverage of these accomplishments bears witness to the circumstance that they served as an arena for interstate rivalries.

This is different with regard to Italy, which was considered a backward country, rather than a competitor. As has been seen in chapter 4, it was assumed that the Mont Cenis

[869] Ibid.
[870] "The Opening of the Suez Canal," *Manchester Guardian*, 24 November 1869, 6.
[871] Ibid.
[872] Ibid.
[873] Ibid.

Tunnel and the intercourse it allowed for would help to accelerate the country's regeneration. Likewise, the tunnel as a piece of engineering work necessitates a reevaluation of the Italian people. Concerning the progressing works at the Mont Cenis Tunnel and the breakthrough that had just been achieved – in the true sense of the word – the *Times* points out that "[i]t will gratify the many friends of the Italian people to recollect that this has been in its plan and execution an Italian work."[874] Once more, it is pointed out that in the past, Italy was deemed inferior and underdeveloped:

> The gifted race (…) came to be looked upon in Europe as incapable of any solid achievement. Its genius in certain forms of art was disdainfully admitted; but Italy, whatever she might have once been, was held to be now only a land of musicians and singers, with some trace of her former ability in painting and sculpture.[875]

Similarly, *Lloyd's Weekly Newspaper* declares that the country "had been pronounced unfit for a place in the van of material progress – a mother of good opera-writers and singers, indifferent artists, and unclean cooks."[876] Clearly, these articles bear witness to the circumstance that the fine arts, in which Italy – in the eyes of British observers – excels, are less esteemed that scientific and technological accomplishments (so-called "solid achievements").

The successful construction of the Mont Cenis Tunnel calls for a reconsideration of the country: the *Times* points out that

> [t]hose who know what kind of men Italy does produce will be quite prepared to believe that in practical science Italians may come to hold a place among the highest. The fact is that 30 years ago, when railway enterprise was in its infancy on the Continent, and even France showed no sufficient recognition of its importance, the idea of piercing the Alps for the transit of trains was conceived by Italian engineers.[877]

Lloyd's Weekly Newspaper also emphasizes that "[i]t will be a matter for self congratulation to the lovers of the Italian people, to know that this last triumph of engineering skill (…) is almost entirely attributed to Italy."[878] The article further declares that the Mont Cenis Tunnel is

> not only a powerful commercial agent and source of many species of wealth, but a signal proof that the Italian race remains as it was – a race exceptionally gifted with scientific genius; and, though the qualities have been drugged or fettered, characterised by considerable energy and perseverance.[879]

[874] "In the Midst of a Desolating War," *The Times*, 26 December 1870, 7.
[875] Ibid.
[876] "The Old Year and the New," *Lloyd's Weekly Newspaper*, 1 January 1871, 6.
[877] "In the Midst of a Desolating War," *The Times*, 26 December 1870, 7.
[878] "The Old Year and the New," *Lloyd's Weekly Newspaper*, 1 January 1871, 6.
[879] Ibid.

In conclusion, it is pointed out that "[t]he fact that the Mont Cenis tunnel (…) has been steadily brought forward during a decade full of events utterly alien to all such peaceful undertakings; proves that new Italy is ambitious, and may become worthy of a foremost place among the great industrial nations."[880] All told, these two passages taken from the *Times* and *Lloyd's Weekly Newspaper*, respectively, therefore aptly illustrate the role attributed to technological achievements when it comes to the assessment of other countries.

7.4 Chapter Summary

This chapter set out to examine to what extent transport and communication technologies were drawn upon in the context of the formation of national identity, on the one hand, and comparisons with other cultures and civilizations, on the other. The analysis has shown that science and technology in general were considered to be a most significant criterion for evaluating other countries and civilizations and that they were deemed to represent national character.

In the publications under review, British accomplishments in the fields of transport and communication technologies were taken to indicate outstanding persistence and determination. In general, British industrial products and technological developments were considered to bear witness to the seemingly quintessentially British commercial and utilitarian spirit. In the eyes of contemporaries, this is where British artefacts differed decisively from those of its continental neighbours, on the one hand, and Eastern civilizations, on the other, as they put more emphasis on decorativeness and ornament and catered mostly to the needs and wishes of a wealthy elite. What is more, technologies and artefacts of non-European civilizations were taken to indicate that their development had come to a standstill and that they consequently lagged behind the times. This was viewed as evidence for Western superiority and thus served as a rationale for Britain's imperial efforts. In the reporting on various transatlantic cables and the Suez Canal, in turn, we can find allusions to interstate rivalries between Britain, on the one hand, and the United States and France, respectively, on the other.

[880] Ibid.

All told, it can thus be noted that science and technology, specifically transport and communication technologies, were crucial elements of British self-conception and identity in the Victorian era.

8. Conclusion to Dissertation

After a long and eventful journey during which they saved the life of a young Indian woman, struggled with a group of Sioux fighters and were finally, upon arrival in Britain, remanded in custody by Detective Fix, Phileas Fogg and Passepartout make it back to the Reform Club on 21 December 1872: "Phileas Fogg had won his wager, and had made his journey around the world in eighty days. To do this he had employed every means of conveyance – steamers, railways, carriages, yachts, trading-vessels, sledges, elephants."[881]He has thus proven that, at least for someone with the financial means at hand, it was possible to circumnavigate the world in eighty days and that, in the words of his fellow card-player Gauthier Ralph, "[t]he world has grown smaller"[882] with the advent of steamships, railways, canals, tunnels and electric telegraphy. Both, the fact that, in the novel, the public is enormously interested in Fogg's journey, and the circumstance that the book found a wide and enthusiastic readership among nineteenth-century contemporaries served as an incentive to study the attitudes, perceptions and expectations that existed among the general public in Victorian Britain towards these technologies. To gain a deeper understanding of their expectations, hopes and anxieties, this dissertation analyzed the media representation of specific nineteenth-century transport and communication technologies. Covering a wide range of topics, one of the main intentions was to show that Victorian approaches towards technology were more complex and multilayered than we are generally led to believe and reach beyond purely technological determinist ideas. In so doing, this dissertation also set out to illustrate that Victorian approaches can be said to have anticipated present-day analyses. Moreover, investigating contemporaries' ideas and beliefs related to transport and communication technologies, we can gain more profound insights into Victorian mentalities on a more general level. On the following pages, the main findings of this dissertation will be revisited. Subsequently, potential areas of further research will be outlined.

[881] Verne, *Around the World in 80 Days*, 148.
[882] Ibid., 12.

8.1 Change, Continuity, Superiority – Representations of Transport and Communication Technologies

The nineteenth century saw a multitude of innovations in the fields of transport and communication technologies and witnessed the establishment of global transport and communication infrastructure. As has been shown in chapter 2, these did not come about overnight, but were the results of long and complex development processes. Nonetheless, as has been seen in chapter 4, nineteenth-century contemporaries viewed the concentration of these scientific and technological innovations as the defining feature of their period and considered them to be the acme of progressiveness – that single quality which above all else delineated their era from ones that had gone before.

Chapter 4 further illustrated how contemporary transport and communication technologies were embedded in various cultural, social and historical contexts and what these linkages achieved. Firstly, they presented an opportunity to accustom the public to new technologies. In comparing them to motifs with which people were familiar – biblical figures or Shakespearean imagery, for example – the public was given the opportunity to acquaint themselves with the emerging technologies and the possibilities they offered. Secondly, these comparisons helped illustrate the dimensions and the extent of the transformation, for instance when new transport and communication technologies were juxtaposed with the accomplishments of ancient Egypt or Greece or compared to well-known mythical figures, such as Hercules or Agamemnon. These comparisons were used to highlight just how outstanding these technologies, and, by extension, the nineteenth century, were. Thirdly, in drawing on such frameworks, one could view nineteenth-century transport and communication technologies as following in the footsteps of ancient advanced civilizations – in other words, as the continuation and culmination of a lengthy development process.

Further, the spate of technological developments in the nineteenth century is also taken to indicate man's special position in the divine scheme, not least because – certainly in the eyes of contemporaries – these advances enabled man to subjugate nature. This approach made it possible for Victorians, living through an era of radical changes, to reconcile latest scientific and technological developments with traditional Christian beliefs.

Additionally, Chapter 7 has shown that the achievements in the fields of transport and communication technologies were central to British self-regard and were deemed to symbolize Britain's alleged superiority over other countries. In this connection, the utilitarian aspect of British achievements was repeatedly emphasized and was thought to distinguish them from other countries' technologies. Existing interstate rivalries between Britain, the United States and France swirled fiercely around the achievements and merits of each country in terms of transport and communication technologies. Accounts of the products and technologies of non-Western civilizations, specifically India, veered between admiration for what the British considered to be exotic beauty and mysticism, on the one hand, and a supreme condescension towards their seemingly primitive production methods, on the other. Such comparisons with non-Western civilizations were therefore taken to symbolize their backward and static condition and consequently fuelled the notion of 'the white man's burden'. In this way, transport and communication technologies were drawn upon to underpin Britain's imperial efforts.

The widespread enthusiasm aroused by the new transport and communication technologies was by no means unanimous, however. Critical voices questioned the common acceptance of man's subjugation of nature, on the one hand, and were skeptical of using the technological advancement of the age as the ultimate yardstick by which to measure progress. Reporting of this kind, however, is extremely rare, at least in the publications under review. Generally speaking, a picture emerges of a period where technology, specifically transport and communication technologies, had become a most significant gauge for judging society.

8.2 For Better or For Worse, Who Shall Say? Transport and Communication Technologies and Technological Determinism

In recent years, activists have repeatedly demanded that the Nobel Peace Prize should be given to the Internet on the grounds that it fosters international understanding. This illustrates that, even today, there is a widespread belief that, once invented and introduced, certain technologies will inevitably bring about specific results and thus shape society and, in fact, 'drive history'. From a sociological point of view, this theory

of technological determinism and the mini-fables it produces[883] does not stand close examination, as it disregards the role of any other contributing factors.

Alternative, sociological approaches therefore focus their attention on technologies in use. In other words, they understand technology as a social process which human actor and technological artefact carry out collectively. In the case of Actor-Network-Theory, this dichotomy is altogether denied; instead, human being and technological artefact are thought to constitute a new hybrid entity. In doing so, these approaches make it possible to factor in other variables, rather than concentrating on the possibilities or risks seemingly inherent to one particular technology. These other factors include, among other things, the motives and intentions of the actors and their familiarity with the technology in question. Technology's impact on the actions of an individual person and society at large is by no means denied, but it is no longer considered to be the one and only decisive factor.

For nineteenth-century contemporaries, it was tempting to ascribe peacemaking qualities to the new transport and communication technologies, simply because they allowed for a speedier and more reliable exchange of information than ever before. In this connection, the electric telegraph and the near-instantaneous communication it enabled would seem to have offered the greatest potential. On closer examination, however (a primary example being Nickles' explorations of the effects the electric telegraph might have had on the outcome of the Trent Affair of 1861),[884] it becomes obvious that the instant communication the telegraph enabled could sometimes have negative and unexpected consequences. Exasperated statesmen, for instance, sending bellicose, ill-considered telegrams, could initiate a vicious circle that inflamed rather than ameliorated the situation. Human error, transmission failures and misunderstandings owing to the brevity of telegraphic messages, were other factors that needed to be considered. Such studies therefore illustrate the necessity of taking into account non-technical factors if we want to judge the efficacy of nineteenth-century transport and communication technologies, specifically the telegraph, as tools of peace.

Chapter 6 examined to what extent transport and communication technologies were represented as 'messengers of peace' and whether contemporaries were aware of the many other factors that could turn out to be critical in this connection. Indeed, we can

[883] Cf. Smith and Marx, introduction to *Does Technology Drive History?*, x.
[884] Cf. Nickles, *Under the Wire*, 65-78.

find numerous passages which emphasize the peacemaking virtues of these technologies and declare that, with speedy channels of communication, international relations must inevitably improve. In this context, railways and steamships are made mention of, but it is the electric telegraph that is deemed the most important and is described as a valuable instrument for crisis management. It has also been shown, however, that this view does not go unchallenged in Victorian media coverage. There is, in fact, a deeper understanding of the many other factors that need to be taken into account in this context. In line with what the use-centred approaches towards technology postulate, the significance of the actors' motives, intentions and perceptions is repeatedly emphasized. In this context, it is also noted that telegraphic communication could worsen a given conflict situation if statesmen did not use it wisely. Moreover, it is referred to the hopes and expectations expressed in connection with previous technological achievements and events and how these have been disappointed. One might therefore also draw the conclusion that contemporaries have learnt from previous experience.

The critical examination of the reporting on transport and communication technologies has thus cast doubts on the widely held belief that nineteenth-century contemporaries were dogmatic devotees of technological determinist beliefs.

8.3 One Vast City – Technologies of Transport and Communication and Changing Perceptions of Time, Space and Distance

Present-day transport, communication and information technologies, most notably the internet and mobile telephony, have brought about changes in the way we perceive time, space and distance. One of the most fundamental ramifications of these media is that our actual geographic location is no longer necessarily of primary importance; instead, connectivity has become a major criterion. The transformations witnessed in recent decades are often subsumed under slogans such as 'global village' or 'data highway' and have given rise to increased interest in space-related questions in a wide spectrum of academic disciplines.

In a similar manner, nineteenth-century transport and communication technologies, specifically the electric telegraph, impacted on contemporaries' perceptions of time, space and distance. In nineteenth-century parlance, these transformations were widely referred to as 'the annihilation of time and space', which – in retrospective – is often

considered evidence that contemporaries did not have sufficient understanding of the structural changes brought about by these technologies.

Chapter 5 therefore examined whether this was really the case or if there were other, more sophisticated approaches. For this, it was first of all necessary to set forth the various concepts which have been developed to grasp and fully comprehend these transformations: Wenzlhuemer's starting point is a relational model of space, according to which there are numerous co-existing spaces, which are shaped by the specific interests and questions of the respective actors. With the emergence of new technologies of transport and communication, so-called transport and communication space have been partially compressed and have been increasingly separated from geographic space.[885] Falk and Abler, on the other hand, focus their attention on several types of distance (globe, effort and metaphorical distance), which are also informed by different interests. Nineteenth-century transport and communication technologies had an impact on effort and metaphorical distance only. The shifting relations between globe, effort and metaphorical distance created so-called distance paradoxes.[886] Both the partial compression of transport and communication space and their divergence from geographic space, on the one hand, and the shifting relations between globe, effort and metaphorical distance, on the other, help to create the impression that distances between two places that are well-integrated in the transport or communication network, respectively, have shrunk; consequently, we tend to perceive such well-integrated places as closer than they actually are.

Analysis of Victorian newspapers has shown that contemporaries' understanding of these transformations brought about by new transport and communication technologies reached beyond the phrase of 'the annihilation of time and space'. In fact, in the publications under review, the slogan seems to be a hyperbole used to summarize the shifts experienced. What is more, it appears that it is to be viewed in connection with contemporaries' pursuit of the subordination of nature. The reporting of nineteenth-century transport and communication technologies also illustrates that there was an awareness and understanding of the discrepancies between various spaces and distances brought about by these technologies which resembles current-day analyses. Furthermore,

[885] Cf. Wenzlhuemer, "Globalization, Communication, and the Concept of Space in Global History," 25-37.
[886] Cf. Falk and Abler, "Intercommunications, Distance, and Geographical Theory," 61f.

the imagery used (vast city, suburb, neighbourhood) is strikingly similar to phrases such as 'the global village'.

For all its wittiness and lightness of tone, the following passage, which *Lloyds' Weekly Newspaper* reprinted from the French *Courrier du Havre*, reveals that contemporaries were well aware that neither time, space, nor distance had been abolished. It also illustrates that there was a good understanding that the factor time, in terms of global communication, had become more important than ever:

> Suppose (…) that a great edifice in Paris – the Opera, for example – takes fire at a quarter past twelve at night on the 1st of September next, the event is immediately telegraphed from Paris to New York, and is dated, 'Paris, a quarter-past [*sic*] twelve at night, 1st September.' The news arrives at New York, let us say in two hours, to make ample allowance for interruptions, &c.; the despatch, dated Paris, 1st Sept. arrives at New York at a quarter-past [*sic*] nine in the evening of the 31st August, so that a New York manager could appear on the stage, and after the three customary bows could thus express himself: - "Ladies and Gentlemen, - I am sorry to have to inform you that the Opera at Paris has been destroyed by fire three hours after the present time. Our director has just transmitted to his Paris confrère his condolence on the disaster which is going to happen to him.'[887]

8.4 Conclusion and Outlook

This dissertation has shown that in Victorian Britain, transport and communication technologies were much more than tools of empire or business only. Instead, they also fulfilled a variety of social and cultural functions and were embedded in a discourse of national identity and Western superiority. It has also demonstrated that contemporaries' approaches and perceptions of these technologies were not as one-sided as has often been assumed and reached beyond a purely determinist perspective. It cannot be denied that there is a great number of passages displaying such technologically determinist beliefs. As this study analyzed the media coverage of various technologies over several decades and, rather than focusing on the weeks immediately before or after a certain event, covered a longer span of time, it has also been seen, though, that this is only one side of the coin. Along with the seemingly dogmatic beliefs mentioned above, there existed a far-reaching awareness of the great number of other factors that could play a role in this context, particularly the importance of the actors involved and their interests. It has also been shown that nineteenth-century contemporaries had a clear

[887] "The Transatlantic Telegraph," *Lloyd's Weekly Newspaper*, 12 August 1866, 8.

understanding of the changing spatiotemporal arrangements created by the new transport and communication technologies, specifically the telegraph. All told, these Victorian accounts frequently bear striking resemblance to present-day analyses and imagery.

This dissertation can only be a first step in an effort to re-evaluate nineteenth-century approaches and perceptions of technology. The scope of this study had to be limited in order to render the material manageable. There is still a substantial body of source material which could be analyzed. Future studies could focus on working-class publications, scrutinize pamphlets and other ephemeral material and examine visual representations in the highly popular illustrated magazines. This would undoubtedly provide further insights into contemporaries' attitudes towards transport and communication technologies.

Given the fact that the press coverage of these technologies served as an arena for international competition – particularly with regard to France and the United States – an analysis of their media representation in American and French publications may also turn out to be highly interesting and challenge the views that were presented in British newspapers.

What is more, the telegraph – despite often being described as a messenger of peace – was also deployed for the purposes of warfare, as were steamships and railways. Possible questions to be addressed in future studies could be to what degree and in which ways these technologies were reported as 'tools of war'. This is of particular interest as it can shed further light on the extent to which contemporaries considered the intentions and decisions of the parties involved or took into account any other factors that could impinge on the outcome of speedy communication.

Beyond that, this dissertation has primarily been concerned with transport and communication technologies. It has been possible to tease out contemporaries' ideas concerning science and technology on a broader, more general level, particularly given the fact that media coverage of the Great Exhibition was taken into account. If, however, we want to gain a more complete picture of Victorian approaches to technology in general, future studies should look into their perceptions of, for instance, medical and environmental technologies, both of which underwent similarly drastic changes and developments in the course of the nineteenth century.

As Eric Hobsbawm has declared, 'looking backward' is essential if we want to face the future.[888] To us, living in an era in which technologies of transport, communication and information are more ubiquitous and pervasive than ever before, this study should be a timely reminder of the importance of constantly questioning our expectations towards these technologies and reviewing the roles we attribute to them.

[888] Cf. Hobsbawm, *On History*, 52.

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