

TECHNOLOGIES OF TIME:
TIME STANDARDIZATION AND RESPONSE IN BRITAIN, 1870-1900

by

Ken Corbett

Submitted in partial fulfilment of the requirements
for the degree of Master of Arts

at

Dalhousie University
Halifax, Nova Scotia
August 2010

© Copyright by Ken Corbett, 2010

TABLE OF CONTENTS

LIST OF FIGURES.....	vi
ABSTRACT.....	vii
ACKNOWLEDGEMENTS.....	viii
CHAPTER ONE: INTRODUCTION.....	1
CHAPTER TWO: CHRONIC ANXIETIES - CLOCKS, TIME, AND TECHNOLOGY IN <i>THE TIMES</i>	15
PUNCTUALITY - THE WATCHWORD OF RAILWAY PASSENGERS.....	19
TIME IS OF THE ESSENCE - NEGOTIATING PUNCTUALITY AND RAILWAY TIMETABLES.....	26
THE PROMISE OF UNIFORMITY - STANDARDIZING AND COORDINATING PUBLIC TIME.....	33
WHAT O’CLOCK IS IT? - PROBLEMS WITH SYSTEMS OF COORDINATION.....	42
CONCLUSIONS.....	48
CHAPTER THREE: THE TEMPORAL IMAGINATION - TIME-DISCIPLINE AND USERS OF TECHNOLOGY IN FICTION.....	51
COMPLICATING THE PRESENT - ENGAGING THE TEMPORALITIES OF TECHNOLOGY.....	55
HARDY, WESSEX, AND THE PACE OF RURAL LIFE.....	64
WELLS, TRANSPORT TECHNOLOGY, AND THE CONQUEST OF SPACE AND TIME.....	74
CONCLUSIONS.....	83
CHAPTER FOUR: CONSTITUTING TIME - TECHNOLOGY AND PHILOSOPHICAL ATTITUDES TOWARDS TIME.....	86
HODGSON AND DODGSON - PHILOSOPHERS OF TIME.....	88
TIME-MEASUREMENT.....	100

WAITING, ANXIETY, AND SUBJECTIVE TIME.....	106
CONCLUSIONS.....	114
CHAPTER FIVE: CONCLUSION.....	117
BIBLIOGRAPHY.....	128

LIST OF FIGURES

FIGURE 2.1 - RAILWAY UNPUNCTUALITY REPORT.....	32
FIGURE 2.2 - RAILWAY TIME.....	39
FIGURE 2.3 - FINDING THE RIGHT TIME.....	44
FIGURE 3.1 - IMPATIENT TRAVELLER AND RAILWAY PORTER.....	70
FIGURE 4.1 - RACING FOR A TRAIN.....	91
FIGURE 4.2 - WHAT'S O'CLOCK?.....	104

ABSTRACT

Between 1870 and 1900 systems of communication and transportation such as the railway and telegraph presented a new landscape in which discussions about time took place in Britain. The practical issues of railway punctuality, time standardization, and clock coordination contributed to a heightened awareness of clock time. Through their encounters with new technological systems, users found that a multiplicity of clock times existed long after attempts to unite local times began. Values concerning the use of railways and telegraph networks arose through interactions between technological artifacts and users. These trends were widely discussed and appeared in a variety of genres of print material. In addition to examining these issues in newspapers and works of fiction, this research traces the debates through philosophical texts. For a number of late nineteenth-century philosophers, encounters with railways and telegraphs opened up the possibility of reexamining the subjective experience of time.

ACKNOWLEDGEMENTS

I would like to thank the people who helped in making this work possible. I owe a great deal of thanks to Dr. Gordon McOuat for his insightful and witty comments and constant encouragement; I feel fortunate to have had you as my thesis supervisor. I would also like to thank my second and third readers, Dr. Shirley Tillotson and Dr. Jerry Bannister. Thank you to all of my fellow graduate students for your moral support; I am grateful for your friendship. I would also like to express my deepest appreciation for generous funding provided by the Social Sciences and Humanities Research Council of Canada which made this research possible. Finally, I would like to thank my family for encouraging me to continue my education.

CHAPTER ONE: INTRODUCTION

During the late-nineteenth and early-twentieth centuries, industrial technologies produced new ways of experiencing time.¹ By 1870 these technological advances were being manifested in an unprecedented discussion of time in print culture. The acceleration and extension of travel and communication through railways and telegraphs contributed to what Karl Marx described as the “annihilation of space by time.”² Accompanied by the feeling that the world was moving at a faster pace, regulated experiences of time were an increasingly important dimension to everyday life. The problems traditionally associated with long-distance travel and communication were soon accompanied by the challenges of creating common standards of coordination. Similar to the introduction of clocks in the workplace and the use of time to regulate labour, new time technologies had the potential to reshape social interaction.³ Time, as understood intuitively, was transformed by the implementation of systems of coordination that culminated in the distribution of time zones based on Greenwich Mean Time (GMT) in the 1880s.

This thesis examines the implementation of GMT throughout Britain as a social mechanism that influenced the private experience of time through public structures of coordination. It considers the discussion of time in print culture as evidence of a reaction to GMT and the technologies which made it both possible and relevant. Not only did the proliferation of railway and telegraph networks during the nineteenth century warrant the

¹ One example of this is the ‘specious present’ first developed by Shadworth H. Hodgson and later by the phenomenologists. See: Shadworth Hollway Hodgson, *Time and Space* (London: Longmans, Green and Co., 1865); Shadworth Hollway Hodgson, *The Metaphysic of Experience* v.1 (London: Longmans, Green and Co., 1898).

² Karl Marx, *Grundrisse: Foundations of the Critique of Political Economy*, trans. Martin Nicolaus (New York: Vintage, 1973), 524.

³ See E. P. Thompson, “Time, Work-Discipline, and Industrial Capitalism,” *Past and Present* 38 (1967): 56-97; Norbert Elias, *Time: An essay*, trans. Edmund Jephcott (Cambridge: Basil Blackwell, 1992).

introduction of national standard times, but reactions to clock times were commonly bound up with these technologies in print media. Contemporaries chose to communicate the experience of a new time-consciousness in periodicals, novels and philosophical texts. Newspapers such as *The Times* and satirical journals like *Punch* helped to shape new forms of time-discipline centered around public clocks and timetables. Books and journals for intellectuals and popular middle-class audiences illustrate how new time experiences engendered by technology were a matter of both national and personal concern at the turn of the twentieth century.⁴

One of the most common narratives in the history of timekeeping has depicted the movement towards modernity as a transition from un-timed to timed societies, that is, the appearance of mechanical clocks as regulators of society. By situating the appearance of mechanical timekeeping devices much later than has been more recently suggested, clocks and clock time have been portrayed as both oppressive and unnatural.⁵ Paul Glennie and Nigel Thrift have challenged these sinister interpretations of mechanical time in their study of the everyday use of clock time in England and Wales between 1300 and 1800. They argue that clock time, as displayed on public clocks already before the seventeenth century, had begun to define time.

Lewis Mumford is one historian to have considered the role of clocks in regulating human affairs. In his *Technics and Civilization* (1934) he defined the mechanical clock as “the key machine of the modern industrial age.”⁶ Although Mumford acknowledged the import with which clockmaking must have been viewed as early as the

⁴ Taking a page from the history of the book, recent cultural history has traced perceptions of science and technology in print culture. See: Marina Frasca-Spada and Nicholas Jardine, *Books and the Sciences in History* (New York: Cambridge University Press, 2000).

⁵ Paul Glennie and Nigel Thrift, *Shaping the Day: A History of Timekeeping in England and Wales 1300-1800* (New York: Oxford University Press, 2009), 57, 48-49.

⁶ Lewis Mumford, *Technics and Civilization* (New York: Harcourt Brace & Company, 1963), 14.

fourteenth century, he claimed the regularity clocks produce in human affairs was a result of the modern clock. That is, the routinization of human affairs in coordination with clocks was a product of the more accurate eighteenth-century timepieces. Accordingly, this temporal regularity based on mechanical clocks is the primary feature of industrial society.⁷ He wrote that the time scale produced by clocks assaulted a more organic experience of time derived from nature.⁸ Similarly, Wolfgang Schivelbusch in *The Railway Journey: The Industrialization of Time and Space in the 19th Century* (1977) argued that for Emile Durkheim and Pitirim Sorokin, railway travel precipitated an awareness that quantitative methods of tracking time were undermining the experience of time. The railway journey made this form of inorganic time reckoning all the more powerful.⁹

Despite Mumford's fairly accurate assessment of the origins of clock time as regulators of community life, Glennie and Thrift have cited Mumford as the beginning of a tradition that views clocks and their impact as overly deterministic. The received view of this paradigm has been that clocks have "an essence" which they impose on individuals. Glennie and Thrift reject the view of mechanical timekeeping devices having a primarily oppressive essence. They argue that clocks do not dictate the regularity of human interaction, but are not entirely passive either. Rather, timekeeping devices are non-human elements in *networks of interaction*.¹⁰ By including timekeeping devices in the process through which social time is created by a variety of forces and actors, Glennie and Thrift aim to dispel the notion that clocks are oppressive and

⁷ Mumford, 269.

⁸ *Ibid.*, 15, 271.

⁹ Wolfgang Schivelbusch, *The Railway Journey: The Industrialization of Time and Space in the 19th Century* (Berkeley: University of California Press, 1986), 36-37.

¹⁰ Glennie and Thrift, *Shaping the Day*, 71-72.

unnatural. The result is that clock time is not produced solely by mechanical clocks but also by a community of individuals. Although the device creates divisions in duration, “notions of standardization, regularity, and coordination are themselves culturally determined.”¹¹ Time-measures produced by clocks should therefore be regarded as a form of social time adopted and given meaning by a community of users.¹²

Given the extensive influence of E.P. Thompson’s “Time, Work-Discipline and Industrial Capitalism” on the history of clocks and time, it is important to define its impact on my research. Thompson’s 1967 paper related the diffusion of time-pieces at the beginning of the industrial revolution to a shift from task orientation to timed-labour. He argued that the demand for a higher synchronization of labour accompanied by industrialization, in turn influenced workers’ internal time-sense and marked a transition from pre-industrial, “natural” time to an industrialized, clock-time orientation.¹³ Thompson situates the transformation from un-timed societies into timed ones as taking place at the end of the eighteenth century in the wake of a diffusion of timekeeping devices. In addition, the language employed to describe this transition is deterministic, suggesting that clock time was imposed on workers, resulting in a new form of time-consciousness. He situates the “propaganda,” and “external pressures which enforced this discipline,” in factories where mechanical time was “rigorously imposed” by “the worst masters [who] attempted to expropriate the workers from all knowledge of time.”¹⁴

¹¹ Paul Glennie and Nigel Thrift, “Reworking E.P. Thompson’s ‘Time, Work-Discipline, and Industrial Capitalism,’” *Time and Society* 5 (1996), 288.

¹² In *Shaping the Day*, they argue that there are multiple clock times constructed by various communities of which they form a part. Glennie and Thrift, *Shaping the Day*, 9.

¹³ Thompson, 80.

¹⁴ *Ibid.*, 85-86, 90.

Despite his acknowledging the prior use of clocks to denote time, he places the transition to a time-disciplined society at the advent of the industrial factory.¹⁵

Thompson's work has been recently critiqued by Glennie and Thrift on a number of grounds. They argue that Thompson considered social time to be homogeneous rather than heterogeneous. In contrast, Glennie and Thrift argue that a variety of time values, even contradictory ones, may and often do coexist in a particular culture.¹⁶ Furthermore, Thompson oversimplified and even disregarded the complexity of pre-industrial time-discipline and time-consciousness; the appearance of time-discipline in everyday life did not follow the use of clock time in factories, but preceded it.¹⁷ A further criticism undermines Thompson's claim that clock time was imposed and that factory workers were passive recipients of a new time-sense. Instead, standards and definitions of time should be understood as culturally determined, so any new time-sense could not simply be imposed on a community.¹⁸ Finally, Thompson's enquiry into the transition from one form of time-awareness to another appears to have been superficially constructed on the premise that a division between modern and pre-modern is readily accessible.

This paper adopts many of the assumptions made by Glennie and Thrift regarding the construction of social time. Rather than suggesting that a shift from un-timed to timed cultures, or pre-modern to modern time values can be identified, it aims to show how pre-existing values were built upon and extended. A heightened awareness of various forms of clock time emerged through interactions with the railroad and telegraph during the nineteenth century.

¹⁵ Glennie and Thrift argue that Thompson drastically underestimated the number of private timekeeping devices, their diffusion, and the extent to which public devices actually influenced time orientation prior to the late-eighteenth century. "Reworking Thompson," 284.

¹⁶ *Ibid.*, 278-279.

¹⁷ *Ibid.*, 282-284.

¹⁸ *Ibid.*, 288.

Despite the aforementioned criticisms of Thompson's "Time, Work-Discipline and Industrial Capitalism," his germinal work establishes a basis on which to ask two related historical questions: How far did technological systems influence the apprehension of time; and to what extent was this influence evidenced in the medium of print?¹⁹ To answer these questions, my research examines the discussion of time in print media alongside the expansion of railway, telegraph, and timekeeping systems in the nineteenth century. It argues that daily encounters with these technologies created the possibility of understanding time in new ways, which were subsequently expressed in discussions of the nature, experience, and regulation of time.

Although the socio-economic impact of railways, telegraphs, and time systems has received significant scholarly attention, few studies have related these technologies to late nineteenth-century discussions of time in print media. Among the recent studies which have examined the intersection of these issues is Stephen Kern's *The Culture of Time and Space 1880-1918* (1983). Kern details the restructuring of time-consciousness as presented in science, philosophy, popular literature, and art, which he terms the culture of time. While Kern produces a wealth of data illustrating a cultural redefinition of both space and time, the genesis of this movement is given a rather superficial examination. Kern demonstrates the basis of a cultural change but fails to provide a serious discussion of its relationship to industrial technologies and scientific discoveries. He does, however, briefly discuss time standardization as a key factor in priming this cultural phenomenon. He states that "[t]he assault on a universal, unchanging, and irreversible public time was the metaphysical foundation of a broad cultural challenge to traditional notions about the

¹⁹ Thompson, 57.

nature of the world[...].”²⁰ While the introduction of standard time represents a significant shift in the way that time was encountered, Kern suggests that it was the rejection of this convention which was culturally expressed.

More recently, the work of historian of science, Peter Galison, has suggested a method of relating the culture of time to the development of accurate time distribution. Galison’s *Einstein’s Clocks, Poincaré’s Maps* (2003) assesses the important aspects neglected by Kern in his study of the culture of time. While discussing the work of Henri Poincaré and Albert Einstein, Galison illustrates how new technologies of transportation and communication facilitated the redefinition of time in theoretical physics and international conventions. He argues that as time standardization became increasingly important, the abstract notion of simultaneity was replaced with a practical custom mediated by technology.²¹ Galison also demonstrates how establishing a new timekeeping system was influenced by international competition to protect imperial interests. Although Galison succeeds in incorporating the technological and scientific dimensions in his method, he neglects to discuss the broad cultural movement that was underway. With this in mind, Galison’s work forms a point of departure for this paper. Technological advances in time-keeping systems mediated both Einstein’s and Poincaré’s notions of simultaneity. I argue that a similar connection existed between cultures of time, industrial technologies, and time standardization. That is, encounters with industrial technological systems mediated new experiences of time. These new temporal experiences formed a cultural expression in print media.

²⁰ Stephen Kern, *The Culture of Time and Space 1880-1919*, 2nd ed. (Cambridge: Harvard University Press, 2003), 313-4.

²¹ Peter Galison, *Einstein’s Clocks, Poincaré’s Maps: Empires of time* (New York: W. W. Norton & Company, 2003), 296-7.

While research on the relationship between timekeeping and culture is abundant, recent work has questioned traditional narratives of standardization. Clark Blaise, Allan Chapman, and Derek Howse have suggested that coordinated systems of time distribution were already employed by the mid-nineteenth century. They suggest that a standard time was imposed from a higher social and economic stratum and that conformity followed naturally. Hannah Gay, James Rooney, and David Nye, however, have questioned the grounds of these claims. They argue that systems capable of coordinating clocks were only becoming common by the end of the nineteenth century.²² The ability to distribute GMT throughout Britain existed neither in 1847, when it was adopted as railway time, nor in 1880 when GMT became legal time in Britain. This poses a serious challenge to the claim of Whitrow and Howse that “by 1855 98 percent of the public clocks in Great Britain were set to GMT.”²³ If GMT could not be delivered to public clocks reliably and accurately, how would it have been possible to replace local times?

Despite the challenges posed by increasing travel and communication speeds, for much of the nineteenth century, time coordination and standardization were not unilaterally perceived as desirable solutions to these problems. Only by the end of the nineteenth century were reasons for employing systems of coordination becoming evident. Indeed, considerable public opposition to the standardization of time continued well into the twentieth century. As Hannah Gay states, “[a]t the turn of the century, British railway passengers were still adjusting their watches, much as international airline

²² Hannah Gay, “Clock Synchrony, Time Distribution and Electrical Timekeeping in Britain 1880-1925,” *Past & Present* 181 (2003), 112; David Rooney and James Nye “‘Greenwich Observatory Time for the public benefit’: standard time and Victorian networks of regulation,” *British Journal for the History of Science* 42, no.1 (2009), 6.

²³ Derek Howse, *Greenwich Time and the Discovery of Longitude* (Toronto: Oxford University Press, 1980), 113; G.J. Whitrow, *Time in History: Views of time from prehistory to the present day* (New York: Oxford University Press, 1988), 164.

travellers do today.”²⁴ Many Britons still conformed to local time.²⁵ So, while railways and telegraphs had been expanding from the early nineteenth century, GMT, which had become railway time by mid-century, had not deposed local time until systems of distribution became feasible. As the ability to distribute coordinated time became a reality, the culture of time identified by Kern was already underway. The technologies, which made time standardization possible and relevant, first precipitated the discussion of time in Britain; standardized time followed later and contributed to the backdrop which railway passengers faced.

Demonstrating the influence of time standardization on culture rests heavily on the premise that clocks regulate social interaction.²⁶ According to Norbert Elias, they make possible the necessary self-control “exerted by the social habitus conditioned by membership of a particular society.”²⁷ Participation in a community implies certain constraints, one of which is a shared time scale. However, the more socially complex a community becomes, the greater the accuracy required in regulating one’s own time. In this way, increasing speeds of passenger/product transportation and communication via railways and telegraphs increased the complexity of human interaction. As a result, punctuality became a greater concern in business and in leisure.²⁸ The awareness of these issues by the mid-nineteenth century created the possibility for discussing time in a new way.

This paper contributes to existing research by examining newspaper editorials and reports alongside philosophical and literary representations of time within their social and

²⁴ Gay, 121.

²⁵ *Ibid.*, 126.

²⁶ Mumford, 14.

²⁷ Elias, 27.

²⁸ Gay, 137-8.

technological contexts. It investigates how communication, transportation, and timekeeping networks influenced a cultural reaction in late nineteenth-century Britain. Evidence of this reaction in print for philosophical and popular audiences illustrates the pervasive influence of technological progress on cultural change. This thesis argues that technological networks mediated the experience of time and that ideas arising from these new experiences were manifested in print material.

According to James Mussell and Mark W. Turner, periodicals are in themselves objects which convey cultural values about temporality. Both Mussell and Turner assess the growth in periodicals during the mid-late nineteenth century for indications of how the serialization of texts influenced the way information was presented in them. Mussell illustrates how the periodical itself restructured how people received information. He argues that as “serial texts, temporality is also inscribed in their material form.”²⁹ Similarly, Turner argues that the various periods of time which journals were serialized by were not arbitrary; rather, they were significant to those who published and read them. He writes that “[b]uilt into the notion of seriality is necessarily some conceptualization of waiting. The pause is a constitutive feature of periodness, of all periodicity—there must be a break in time.”³⁰ New conceptions of time appeared out of even the publishing cycles of journals. While effecting time-disciplines of their own, newspapers, journals, and other serialized texts also pointed to the new times arising from industrial technological systems.

²⁹ James Mussell, *Science, Time and Space in the Late Nineteenth-Century Periodical Press: Moveable Types* (Burlington: Ashgate, 2007), 92.

³⁰ Mark W. Turner, “Periodical Time in the Nineteenth Century,” *Media History* 8, no. 2 (2002), 191, 193.

In 1889 T. P. O'Connor reflected on the changes which had recently taken place in journalism. According to him, the style of writing employed in newspapers and journals was no longer a mere list of facts designed to inform readers about major events. A new journalism had established itself. It involved a more personal style of writing with more emphasis on creating an image of the events the news related and what it was like to experience them firsthand.³¹ He attributed part of these changes to the new demands of reading. Newspapers were no longer read in private, but in a crowded railway carriage and left behind for others once read.³² The railway had become part of the environment in which news was being digested. Not only were people reading more while railway travelling, but the railways delivered news much more rapidly than the previous coach systems had. In addition, telegraphy revolutionized the way news was gathered by papers.³³ In light of the impact these technologies had on how much and when people read, Ben Marsden and Crosbie Smith have labelled them literary technologies.³⁴ Given this influence on reading, print media form an ideal source in which to examine the time-awareness emanating from these technological systems. How did passengers who read while travelling understand the technologies through print media?

This thesis focuses on the experience of railway passengers and senders/receivers of telegrams as “users” rather than railway engineers, porters, or telegraph operators. The latter had a much more intimate and developed understanding of how these technological systems worked. Their specialist periodicals reveal this, often containing anecdotes about

³¹ T. P. O'Connor, “The New Journalism,” *The New Review* 1, no. 5 (1889): 423-424.

³² *Ibid.*, 434.

³³ Headrick, *When Information Came Of Age: Technologies of Knowledge in the Age of Reason and Revolution* (New York: Oxford University Press, 2000), 206; Carolyn Marvin, *When Old Technologies Were New: Thinking About Electrical Communication in the Late Nineteenth Century* (New York: Oxford University Press, 1988), 216-217.

³⁴ Ben Marsden and Crosbie Smith, *Engineering Empires, A Cultural History of Technology in Nineteenth-Century Britain* (New York: Palgrave Macmillan, 2005), 158, 239.

the relative ignorance of users. Carolyn Marvin has demonstrated that marking the boundary between insiders and outsiders was one of the central functions of these periodicals.³⁵ Although cost would have been a factor limiting accessibility to novels, newspapers, and serial publications, they required only literacy rather than technical literacy. I have therefore aimed to give an account of a cultural expression of new ideas about time discussed in printed materials written by passengers for passengers.

The primary evidence for this thesis consists of published books, essays, and newspapers from the late nineteenth century. These can be divided into three categories: editorials or reports from newspapers and popular journals; short stories and novels; and philosophical essays and books. The division of these sources into three distinct categories forms the basis of the chapter divisions.

Chapter Two discusses public opinion concerning time as reflected in editorials and reports from newspapers and popular journals. Editorials and reports from newspapers and other periodicals directed at popular audiences provide a groundwork for exploring the fictional and philosophical sources in the debates over time standardization and coordination. I examine commentaries and reactions to the railway's and telegraph's impact on the experience of space and time and explore the arguments for and against the adoption of GMT throughout Britain. One of the primary concerns which shaped public opinion about standardized time was the growing emphasis on railway punctuality. This Victorian preoccupation with punctuality applied to railway operation led to a heightened awareness of clock time. In response, systems developed to coordinate and standardize

³⁵ Marvin, 15.

these times. The inadequacy of these systems revealed to passengers a plurality of clock times rather than the publicly heralded uniformity they were promised.

Chapter Three examines the use of time in fiction. The most notable example of this in the late nineteenth century is H.G. Wells' *The Time Machine*, which was first serialized in both the *National Observer* and the *New Review* before being published as a novel. I analyze this novel as a commentary on attempts to bring time under the control of technology much in the way space had been conquered by the steam engine and electrical communication. Several novels written by Thomas Hardy reveal a latent awareness that the divide between time-consciousness in the metropole and in rural areas was established by the use of industrial technological systems.³⁶ The semi-fictional setting of Wessex operates as a means of showing the particular relationship between users and technological artifacts.

Chapter Four situates late nineteenth-century philosophical ideas of time within the heightened demands of coordinating one's own time with that of the community. It examines the discussion of time in such British periodicals as *Mind* and *The Proceedings of the Aristotelian Society* as well as other published works such as those of Shadworth Hollway Hodgson and Charles Lutwidge Dodgson. It argues that the philosophical problem of time in the late-nineteenth century was a manifestation of new experiences produced by interactions with industrial technologies. These technologies presented the possibility of distinguishing public and private time in a philosophical context. Evidence

³⁶ A number of these novels were also serialized in literary periodicals including *Tess of the D'Urbervilles* which appeared in the *Graphic* in 1891, *Far from the Madding Crowd* which appeared in *The Cornhill Magazine* in 1874, and *Jude the Obscure* which was serialized in *Harper's Magazine* beginning in 1894.

of this is present in the use of technology to express the experience and conception of time as forms of measurement.

CHAPTER TWO: CHRONIC ANXIETIES - CLOCKS, TIME, AND TECHNOLOGY IN *THE TIMES*

Q. What do you mean by “Greenwich Time?”

A. Well, I should say from April to July, after which the whitebait are worthless.

Q. What is “mean time” at Greenwich?

A. It has two significations. For example, the first is when my mother-in-law comes to spend a day with my wife, and *I am mean-time at Greenwich.*

Q. And the second signification?

A. When you are asked to join a friend at Greenwich, and he won't stand you a dinner, or refuses to pay for Pommery *très sec.*¹

The social and economic impact of both the railway and the telegraph which accompanied it have been examined extensively and are occasionally linked to the development of standardized time, and systems of coordinated time distribution. The dramatic increase in railway travel between the 1840s and 1900 brought more individuals into contact with varying local times and strict schedules.² The same can also be said of the growth of telegraph networks and telegrams. As the railway network itself developed into a high-speed coordinated system with regular departure and arrival times, its passengers acquired a new sense of mechanical time. Rather than being rejected as something oppressive, the mechanical time that regulated trains and telegraphs became more fully integrated into the popular consciousness of late nineteenth-century England. The railway and telegraph created the possibility for understanding clock time in a new way by facilitating passenger demands of punctuality and complicating the use of time standards. The users of these technologies faced daily the homogenization of clock time in timetables, and clocks in stations and public spaces coordinated by telegraph signals.

¹ “Astronomical and Scientific Remarks,” *Punch* 70, December 14, 1876, 319.

² Jack Simmons, *The Victorian Railway* (New York: Thames and Hudson, 1991), 341-342. According to Derek H. Aldcroft, between 1870 and 1900 the number of passengers who travelled by rail increased from 332 million to 1.1 billion. Furthermore, the railway network's mileage increased from 13,565 miles to 18,680 miles. Derek H. Aldcroft, *British Railways in Transition* (Toronto: St. Martin's Press, 1968), 5. These figures are slightly more conservative than those given by Harold Pollins in *Britain's Railways: An Industrial History* (Newton Abbot: David and Charles Publishers Limited, 1971), 56, 89.

In facing the complex system of rail travel and electronic communication, the industrialized citizen became more acutely aware of the clock times on which these systems operated. However, while coordination and standardization were the goals, they were not always achieved. Deviant clocks still showing local time existed into the twentieth century, and the global submarine telegraph network presented users with a plurality of times that opposed public standards.³ Clock time became an issue of public concern in the late nineteenth century, and it appeared regularly in periodicals such as *Punch* and *The Times*.

This chapter tracks various editorials and reports from *The Times* and other periodicals between 1870 and 1900 dealing with the punctuality of trains, the accuracy and visibility of clocks, and the plurality of clock times accessible through the telegraph. In publishing the complaints and experiences of railway passengers and telegraphers, nineteenth-century periodicals helped to communicate the experience of time arising from encounters with industrial technologies. Passengers read these complaints—written by other passengers—while they travelled.⁴ Newspapers and periodicals developed a special relationship with railways over the course of the nineteenth century. Periodicals printed in London had to be sent by train to reach subscribers and local papers quickly. The speed with which London papers were distributed to residents of outlying cities by rail meant that local newspapers were often days behind in reporting events.⁵ While *The Times* had dominated the London press in circulation prior to 1855, after the repeal of the stamp duty, penny papers experienced a surge in subscriptions. *The Daily News*, *The Daily Telegraph* and *The Standard*, which were sold at one-third the price of *The Times*,

³ Gay, 138-139.

⁴ Marsden and Smith, 158-159.

⁵ C. Wilson, *The First with the News: The History of W.H. Smith 1792-1972*. Quoted in Simmons, 239.

soon exceeded its circulation.⁶ *The Times*, however, still remained foremost among the London press, and its subscribers in the country demanded that they receive it early.⁷ By 1875 *The Times* had negotiated with the London & North Western railway to ship its paper to the country an hour earlier than the other London newspapers. This special arrangement was quickly ended once its competition became aware of the situation.⁸ Given its prominence in the London press, reports and editorials from *The Times* constitute the main source for this chapter in addition to articles from a variety of other London and provincial periodicals.

Through these periodicals, this chapter traces how industrial technologies were understood by their users and how they were presented to segments of the reading public. Opposing Thompson's claims that time-discipline was imposed, and clock time was oppressive,⁹ these periodicals reveal users of technology as active in negotiating the role of standard time in the life of the nation. Through their interactions with technologies like railways, telegraphs, and timekeeping devices, users extended and intensified pre-existing norms concerning punctuality and the importance of clock time in daily life. The opinions presented in late nineteenth-century periodicals show that encounters with various technologies were exceedingly complex and often contradictory. On the one hand, railways were facilitating the development of a more narrowly defined sense of punctuality and promoting the use of GMT through railway timetables and telegraphically synchronized clocks. On the other hand, they increased at the same time the likelihood of encountering deviations from GMT in public clocks, timetables, and

⁶ Lucy Brown, *Victorian News and Newspapers* (Oxford: Clarendon Press, 1985), 31, 40-42.

⁷ Simmons, 140-241; Aled Jones, *Powers of the Press: Newspapers, Power and the Public in Nineteenth-Century England* (Brookfield: Ashgate Publishing Company, 1996), 33.

⁸ Simmons, 239-240.

⁹ Thompson, 82-82, 85, 87, 90.

other time standards in telegrams. These experiences challenged the homogenization of clock time which railways and telegraphs had been encouraging since the middle of the nineteenth century. The very systems which were employed to unify time also increased the possibility of experiencing a multiplicity of times.

Prior to the development of the railway network in the first half of the nineteenth century, travellers in Britain were mainly limited to roads for long distance travel. Since the mid-eighteenth century the quality of roads and the speed of coaches increased and the number of departures had steadily risen. The first regular coach service to appear ran between Bristol in London in 1784. A year later another twenty-four services were in operation connecting the larger cities of Britain.¹⁰ Travel times between most major cities by coach were reduced by half and the number of departures increased eightfold between 1790 and 1830.¹¹ By the late eighteenth century there is evidence that the practice of publicizing departure and arrival times of coach services had already begun. In contrast, the less expensive wagon services were only listed by the day of arrival and departure rather than the hour.¹² With the advent of the railways, long distance travel became a much more common experience. Already in the late 1830s railways were carrying as much as eleven times as many passengers as had previously travelled corresponding routes by coach. Between 1840 and 1870 the number of rail passengers had increased 2,000 percent.¹³ The railway network itself also continued to expand throughout the nineteenth century. The total mileage of the British rail network, which had reach 7,500

¹⁰ Nigel Thrift, "The Making of a Capitalist Time Consciousness," in *The Sociology of Time*, ed. John Hassard (New York: St. Martin's Press, 1990), 120.

¹¹ Philip S. Bagwell, *The Transportation Revolution from 1770* (London: B.T. Batsford Ltd, 1974), 29-31.

¹² Glennie and Thrift, *Shaping the Day*, 106.

¹³ Bagwell, 95.

miles in the first half of the nineteenth century, had grown to 23,441 by 1912.¹⁴ By the middle of the nineteenth century, railway companies had noticed the need for standardizing the time kept at their stations and adopted GMT as railway time.

Initially, rail travelers were frightened by the new technology and its ability to destroy the time-space experience of coach travel, but by the late-nineteenth century passengers had acclimatized themselves to the effects of high-speed travel.¹⁵ While the novelty of the railway, and the telegraph which accompanied it, had diminished by the late-nineteenth century, their impact on the time-consciousness of Britons remained and even intensified. According to Clark Blaise, time was no longer a master, but a servant and the advent of standard time in British railway companies in 1848 was an affirmation of this.¹⁶ Decades after GMT was introduced as railway time, passengers were still discussing its proper use in schedules and clocks alongside the failure of companies to keep their trains punctual to the times they advertised. At the behest of disgruntled passengers these issues became public concerns.

PUNCTUALITY - THE WATCHWORD OF RAILWAY PASSENGERS

Jenny Shaw has defined punctuality more broadly as a general component of social interactions. A community may have specific beliefs about the appropriate age of marriage, or leaving the home of one's parents. These should also be understood as punctual norms. Such definitions of punctual behaviour, along with the more contemporary concept concerning clock time, are culturally determined and subject to

¹⁴ *Ibid.*, 83.

¹⁵ Schivelbusch, 165.

¹⁶ Clark Blaise, *Time Lord: The Remarkable Canadian Who Missed His Train and Changed the World* (Toronto: Alfred A. Knopf Canada, 2001), 4-5.

variation. She argues that the modern connotation of punctuality as related to clock time appeared first in during the eighteenth century in Britain. By then, public and private timekeeping devices were being used to gauge adherence to the values of politeness. Expectations of punctuality and the failure to meet them quickly became intertwined with feelings of impatience.¹⁷ Norbert Elias has likened the creation of mores about punctuality to the development of social rules within a community. He suggests that there are a variety of speeds in which individuals conform to newly arising social norms. When individuals fail to uphold expectations of punctuality, an external force of compulsion will coax the offenders into compliance. The goal of this process is ultimately individual self-regulation and conformity.¹⁸ Elias' model appears to apply particularly well to the relationship between passengers and late nineteenth century railway companies.

With the advent of railway systems, new complex social situations appeared. Railways brought an unprecedented number of individuals together at specified times and kept them in a confined space for a pre-determined duration, only ending their captivity at a specified location. As a result, concerns about social interaction and punctuality increased exponentially, “[p]assengers were made hyperconscious of time, of each passing minute,... it created anxieties bordering on agony.”¹⁹ Given that passengers had to be more acutely aware of clock times in order to catch trains and plan an excursion,

¹⁷ Jenny Shaw, “Punctuality and the Everyday Ethics of Time: Some evidence from the Mass Observation Archive,” *Time and Society* 3, no. 1 (1994), 80-2; Glennie and Thrift, *Shaping the Day*, 273.

¹⁸ Elias, 32-33.

¹⁹ Blaise, 71; In addition, Ben Marsden and Crosbie Smith have noted that passengers began reading during their travels to avoid awkward and embarrassing social situations in the railway carriage. Marsden and Smith, 158.

failures to uphold passenger expectations were all the more egregious. Waiting indicated the very lack of coordination and the violation of a contract.²⁰

Evidence from *The Times* suggests that as early as 1845 railway passengers had developed expectations of punctuality. In a letter to the editor published on November 13, Viator claimed that “[i]n railway travelling the great safeguard to the public is regularity and punctuality.”²¹ The complaint was directed at the South-Eastern Railway for a late arrival of one hour and eleven minutes past the advertised time. Viator’s complaint connected the punctuality of trains to passenger safety, as at this time it was necessary for trains to keep to their schedule in order to avoid running into other trains which might be on the line. This would have been the case until 1889 when the Regulation of Railways Act made the use of the block system, as opposed to the time interval system, mandatory.²² While Viator’s letter to *The Times* is an early example of complaints against railway companies for their inability to keep trains punctual, by 1870 railway punctuality had become the concern in itself, rather than a means of ensuring safety.

As passengers became more accustomed to railway travel, and the technology became a part of daily life for many, unprecedented expectations of efficiency and timing began to develop. It was not uncommon for passengers to expect to reach their destination within ten minutes of posted arrival times. Complaints about unpunctual trains soon appeared regularly in late nineteenth-century periodicals. *Punch* laughingly deemed it one of the railway passenger’s most sacred duties “[t]o pounce upon and

²⁰ Peter L. Berger and Thomas Luckmann, *Social Construction of Reality: A Treatise on the Sociology of Knowledge* (New York: Anchor Books, 1967), 27; Shaw, 94.

²¹ Viator, “To the Editor of the Times,” *The Times*, November 13, 1845, 6.

²² Regulation of Railways Act, 1889, 52 & 53 Vict., c. 57. The time interval system gave trains a limited period of time to clear a section of track before another train would occupy the same space. The block system, however, relied on signals transmitted by telegraph to control sections of rail and advise trains whether to proceed or stop.

expose in the public prints every instance of carelessness, recklessness, delay, and unpunctuality.”²³ In this manner, A. F. Westmacott complained that on eight occasions between June 9th and 20th, his train was late in its arrival at Victoria station between one and ten minutes.²⁴ Punctuality was becoming a central concern of passengers, and the acceptable limits within which a train could be deemed on time were narrower. However, complaints of unpunctuality exceeding thirty minutes to an hour were still common between 1870 and 1900, perhaps because they represented more outrageous offenses to passengers’ expectations.

One of the prime contributors to the heightening of concerns for punctual trains was the growth of commuter traffic into London. During the 1860s the railway companies focused on increasing local passenger traffic around the metropole. Given the railway’s early commitment to long-distance travel, most companies had been reluctant to run trains for short distances with numerous stops. However, the introduction of workmen’s trains under an act of Parliament—earning them the name “parliamentary trains”—had many companies reassess their routes.²⁵

The principal acts to introduce working class fares were the Railway Regulation Act 1844, and the Cheap Trains Act 1883. The Railway Regulation Act first made all companies offer one daily train in each direction of the line for no more than one penny a mile. The Act stated that its goal had been to offer “the poorer Class of Travellers the Means of travelling by Railway at moderate Fares, and in Carriages in which they may be protected from the Weather.”²⁶ It also created an incentive for companies by eliminating

²³ “The Railway Passenger’s Duties,” *Punch* 67, August 1, 1874, 47.

²⁴ F.A. Westmacott, “Brighton Railway,” *The Times*, June 20, 1870, 8.

²⁵ Simmons, 326.

²⁶ Railway Regulation Act, 1844, 7 & 8 Vict., c. 85.

the passenger duty on these fares. The Cheap Trains Act established mandatory workmen's trains within urban boundaries and extended the powers of the Board of Trade to regulate passenger fares.²⁷ However, as early 1852 companies had begun offering workmen's trains both at their own volition and at the behest of special Parliamentary acts which applied only to an individual company.²⁸ The Great Northern and the Great Eastern were two of the principal companies to offer suburban services; both experienced a serious increase in their suburban traffic throughout the 1870s.²⁹ Unfortunately for commuters, unpunctuality was most common on local trains.

The complaint that timetables were almost never adhered to was a recurrent theme throughout the late nineteenth century. Despite the short distances commuter trains had to cover—usually no more than 12 miles—they were systematically between ten and thirty minutes late.³⁰ One commuter complained that over six months in 1878, not once did his train from Eltham Station to Cannon street—a distance of seven miles—arrive on time. The trip, which was reported to last only twenty-five minutes, regularly took thirty-eight to fifty.³¹ Similarly, trains from Richmond were almost always fifteen minutes late according to one passenger, who claimed the line had never been punctual.³² For many passengers who wrote letter to the companies and to newspapers about their experiences, it appeared as though unpunctuality had become the railway companies' motto.³³

²⁷ Cheap Trains Act, 1883, 46 & 47 Vict., c. 34.

²⁸ H. J. Dyos, "Workmen's Fares in South London, 1860-1914," *Journal of Transport History* 1, no. 1 (1853): 7-8.

²⁹ Michael Freeman, *Railways and the Victorian Imagination* (New Haven: Yale University Press, 1999), 136-138; Simmons, 326, 328.

³⁰ Season Ticket Holder, "Railway Unpunctuality," *The Times*, October 10, 1877, 7.

³¹ Season Ticket, "Railway Unpunctuality," *The Times*, June 26, 1878, 6. They further complained that one week each year was lost to unpunctuality under these conditions.

³² R. and C., "Railway Punctuality," *The Times*, August 10, 1874, 7.

³³ "Railway Drama for August," *Punch* 67, August 29, 1874, 91.

Passenger speculation as to the cause of delay varied and usually ranged from claims of insufficient carriages, the long hours of railway employees, general mismanagement of the schedules of trains on the line, and outright dishonesty. Although it is difficult to assess why railway companies failed to enforce punctuality on their lines, it may have been related to the minimal fares they were forced to charge by the Board of Trade and special Parliamentary acts. Directors complained that it was impossible to make a profit under these legislated fares, and it is not difficult to imagine that punctuality on such lines would have been a minor concern for companies if they were not a source of profit.³⁴ A number of disgruntled passengers made the connection to less expensive fares and the surge in unpunctuality during the 1870s. They argued that the general increase in railway unpunctuality coincided with the inclusion of third class carriages on fast trains. As they understood it, the general state of confusion that these inexperienced travelers created at the station caused delays and required that the train “make up time” often with disastrous results.³⁵ In the eyes of these railway veterans the influx of passengers attracted to lower fares and who were not yet accustomed to railway travelling was directly linked to unpunctuality.

Whatever the reasons companies failed to ensure punctuality, passengers complained of the adverse effects this neglect had on their lives:

[...] it had become most difficult to carry out many of the duties of professional, or even ordinary everyday life, which involved a railway journey. One could never calculate on reaching a given place at a fixed time, and it became, consequently, impossible to make engagements in which punctuality was an element.³⁶

³⁴ Bagwell, 134; Simmons, 326.

³⁵ Francis Close, “Railway Unpunctuality,” *The Times*, January 17, 1874, 8; W.M., “Railway Unpunctuality,” *The Times*, January 22, 1874, 6; A Physician, “Railway Unpunctuality,” *The Times*, September 9, 1874, 6.

³⁶ A Physician, “Railway Unpunctuality,” *The Times*, September 9, 1874, 6.

The lack of punctuality continued throughout the late nineteenth century and perplexed many travelers. One wrote to *The Times* about the misplaced priorities of passengers when it came to the cost of fares: “I have often wondered why, if time is really money,... the public, which has kept the Board of Trade and Parliament in a fever over good rates, has been so patient under the persistent unpunctuality.”³⁷ The regularity of unpunctuality was noted both as a serious plague to the passengers and as a point of irony. Some, like R.S.F., felt that the “Old Times coach” would have outpaced the train he took between Brighton and London.³⁸ *Punch* sought to treat the issue with humour, while still telling the reality of the situation. In its Railway Cookery Book the following recipe directed interested readers “*How to Make a Wild Public*”:

Advertise a Train to start from one station to arrive at another in time to enable Passengers wishing to proceed further on their journey to catch another Train. Dawdle a little, and let your first Train arrive five minutes after your Second Train has started. This will turn your Public wild, [t]hen serve out quickly with Official Sauce.³⁹

Unfortunately for passengers, *Punch* knew all too well that holding the directors of companies liable for accidents, unpunctuality, and lost luggage was out of the question. Their chef sadly reported that the recipe for such a dish had unfortunately been lost.⁴⁰ While many passengers lamented over the seemingly helpless situation, others sought reparations and did so with relative success.

³⁷ T.H. Farrer, “Railway Punctuality—The North British and the Midland,” *The Times*, July 30, 1891, 14.

³⁸ R.S.F., “Railway Punctuality,” *The Times*, January 5, 1889, 12.

³⁹ “The Railway Cookery-Book,” *Punch*, September 26, 1874, 128

⁴⁰ “The Railway Cookery-Book,” *Punch*, September 26, 1874, 128.

TIME IS OF THE ESSENCE - NEGOTIATING PUNCTUALITY AND RAILWAY TIMETABLES

Disagreements over railway punctuality were also disagreements about timetables. Mike Esbester has noted that as early as the 1850s passengers were looking to timetables as contracts that ensured the timely arrival of trains. “Timetables,” he argues, “became a means through which time was contested.”⁴¹ With the sheer volume of timetables printed each year, by the 1880s “timetables came to play a part in the public life of the nation.”⁴² Part of the role they played in public life was providing a metric against which acceptable standards and mores of using time could be established and challenged. Time-discipline was negotiated rather than imposed and passengers rather than railway companies were the driving force behind this negotiation. In fact, companies appear to have been slowly coerced, at the behest of passengers, into upholding timetables and being liable for the issues railway unpunctuality caused.

The appearance of timetables in 1838, followed by the first *Bradshaw* in 1839, both provided important information to passengers and posed challenges to the railways. Initially arrival times were not printed at all as directors felt that “they might make punctuality a kind of obligation.”⁴³ According to reports in *The Times*, railway companies took steps to protect themselves against liabilities for the delay of trains. Given the increasing emphasis on the punctuality of trains, companies found ways to avoid liability for delays. By the 1870s timetables issued by companies included disclaimers that clearly defined the purpose of arrival and departure times listed therein. Disgruntled

⁴¹ Mike Esbester, “Designing Time: The Design and use of Nineteenth-Century Transport Timetables,” *Journal of Design History* 22, no. 2 (2009), 108.

⁴² Esbester, 96. He also notes that in one year a railway company printed 35,000 copies of a summer timetable alone.

⁴³ Eric L. Waugh, “Railroads and the Changing Face of Britain,” *The Business History Review* 30, no. 3 (1956): 289. Despite the appearance of timetables in 1838, many companies included disclaimers on their tables and sometimes omitted arrival times altogether. Simmons, 183.

passengers wrote to *The Times*, informing fellow passengers of what lay on the reverse of tickets and timetables.

The train-bills are only intended to fix the time at which passengers may be certain to obtain their tickets for any journey from the various stations, it being understood that the trains shall not start before the appointed time, but the Directors give notice that the company do not undertake that the trains shall start or arrive at the time specified in the bills, nor will they be accountable for any loss which may arrive from delays or detention except upon proof that any such delay was caused by the wilful misconduct of the company's servants.⁴⁴

Such disclaimers proved useful in the courts because they challenged the passenger's claim that either the ticket or the timetable published by a company entailed a contract concerning the arrival and departure of trains. Despite these efforts, passengers could still have success in receiving compensation for delayed trains. According to Dudley Leathley (a commuter),

[o]ne of the most common abuses is the constant lateness of the morning trains which convey passengers from the country to London... The London and South-Western Railway has twice paid cab hire into Court upon my suing for it; in one instance the train was 16, and in the other 34 minutes late.⁴⁵

Despite the efforts of railways to avoid responsibility for the punctuality of their trains, passengers could and did prevail. Though some passengers—like Leathley—needed only write to the companies for redress, others had to take their case to the courts.

As early as 1870 *The Times* reported on the liability of railway companies for causing delays. By then the courts were likely to award passengers the expenses they had incurred as a result of unpunctuality. Companies were made to pay for accommodation,

⁴⁴ "Railway Unpunctuality," *The Times*, March 12, 1874, 7. A similar disclaimer also appeared in a report on a suit against the Great Western Railway Company: "Railway Unpunctuality," *The Times*, April 2, 1874, 6.

⁴⁵ Dudley Leathley, "Railway Grievances," *The Times*, August 18, 1875, 8.

meals, telegrams, and other means of transport.⁴⁶ Many cases dealt with compensating passengers for monetary losses incurred as a result of the delay. In one case, a farmer received reimbursement for the sales he lost on several rams that were not transported to a fair on time.⁴⁷ A similar case occurred in 1890 when Shackleton, a pigeon breeder, sued the Great Northern railway for prizes lost as a result of the company's breach of contract to convey his exhibits to the competition. Despite the railway's denial that any contract of punctuality existed, the court awarded the case in favour of the plaintiff. However, the judge deemed the claim for prize monies unsubstantiated and awarded Shackleton the entry fees for the competition and the costs of transportation.⁴⁸

Although conflicts between passengers and railway companies were mostly related to reimbursing fares and costs incurred as a result of missed or lost trains, they were also concerned with lost time. In 1874, *The Times* reported on one case where the plaintiff, C.H. Turner, sued the Great Western railway company for "his useless loss of time, and the 'loss of his franchise.'"⁴⁹ His train had been delayed over an hour because of an accident on the line and as a result Turner missed his connection and was unable to reach the poll before it closed. In such cases plaintiffs appear to have been unsuccessful, whereas when freight and expense justified by receipts were concerned, companies were held liable.⁵⁰

Although reasonable damage claims were a concern in deciding the outcome of the conflict between railway companies and disgruntled passengers, the issue of what

⁴⁶ "Railway Liability for Unpunctuality," *The Times*, March 9, 1876, 5. In such decisions the courts appear to have sought the cause for unpunctuality. If none was provided, companies were forced to pay.

⁴⁷ "Railway Liability for Delay," *The Times*, November 24, 1870, 4.

⁴⁸ *Shackleton v. The Great Northern Railway Co.*, 34 Sol. J. 381 (1890).

⁴⁹ "Railway Unpunctuality," *The Times*, March 12, 1874, 7.

⁵⁰ "Railway Liability for Delay," *The Times*, November 24, 1870, 4; "Railway Unpunctuality," *The Times*, April 24, 1874, 11.

formed a contract became pivotal. In the early 1870s suits for unpunctuality were embroiled in a legal debate over what exactly a timetable symbolized. Railway companies included disclaimers—like the one quoted above—on their timetables and tickets in the hopes of avoiding liabilities for delay. In the majority of these cases, judges held that such disclaimers confirmed the contract and the value of times listed in the company’s tables. In one case, the Great Western claimed their notice rendered the contract unbroken as they only claimed to ensure transportation in “a reasonable time.” Furthermore, common law established in the practices of negotiating special contracts with coaches long before railways even existed upheld a company’s liability for unpunctuality.⁵¹ Reiterating this, the presiding Judge decided “[r]ailway companies, on the other hand, have invariably fixed their own times of arrival, and thereby fixed what are reasonable times.”⁵² Disclaimer or no, by printing timetables railway companies were entered into contracts with their passenger, the substance of which was time.

Despite this, railways appear to have commonly employed the tactic of denying any contract of punctuality existed between them and their passengers. In the same year the Lancashire and Yorkshire Railway Company went so far as to argue that “the public are not justified in making business arrangements dependent upon the times mentioned in the time bills.”⁵³ In the view of the County Judge, the railways were intending to remove time from the contract, however, he felt “[t]ime is to the passenger of the essence of the contract.”⁵⁴ With some exceptions, when courts deemed that timetables formed a contract the onus fell on the company to prove their negligence was not behind the delay.

⁵¹ *Becke v. Great Western Railway Company*, 18 Sol. J. 972 (1874).

⁵² *Ibid.*

⁵³ *Parkinson v. Lancashire and Yorkshire Railway Company*, 18 Sol. J. 532 (1874).

⁵⁴ *Ibid.*

This did not mean railway companies were legally bound to run their trains on time regardless of all other considerations. When they could demonstrate unpunctuality had been caused by events beyond their control, such as foul weather or another company's interference, judges were quick to dismiss suits against them.⁵⁵ One notable exception to this was *Russell v. Great Western Railway Company*. Although Judge Calliard upheld the position that timetables constituted contracts between passengers and railway companies, in opposition to other rulings he deemed it was the responsibility of passengers to show that companies had been negligent in cases of delay.⁵⁶ However, in many cases when railway companies failed to show they had observed due diligence in making their trains punctual, emphasizing instead that no contract existed, they usually paid.⁵⁷

The continuation of railway unpunctuality until the end of the nineteenth century and into the twentieth century motivated some to call for punitive action against the railways. Bramwell complained that trains "constantly are after their time from causes which [the directors] know will make them so."⁵⁸ His contempt for the repeated offenses caused him to suggest legal action that held them accountable for more than his fare:

I have thought of an indictment of the directors for obtaining money under false pretences. That the fares are obtained on a false pretence is certain. It is pretended that the train will start and arrive at or about certain time, when there is no hope or expectation that it will.⁵⁹

⁵⁵ *Clough v. Lancashire and Yorkshire Railway Company*, 18 Sol. J. 454-455 (1874); *Thompson v. The Midland Railway Company*, 34 L. T. R. 34-36 (1876); *Fitzgerald v. The Midland Railway Company*, 34 L. T. R. 771-774 (1876).

⁵⁶ *Russell v. Great Western Railway Company*, 18 Sol. J. 508 (1874).

⁵⁷ *Le Blanche v. The London and North-Western Railway Company*, 34 L. T. R. 25-30 (1875, 1876). Other cases cited as precedents of this include: *Prevost v. The Great Eastern Railway Company*, *Buckmaster v. The Great Eastern Railway Company*, *Hamlin v. Great Northern Railway Company*, and *Hobbs v. London and South-Western Railway Company*.

⁵⁸ Bramwell, "The Brighton Railway," *The Times*, July 28, 1891, 10.

⁵⁹ *Ibid.*

While Bramwell felt that a suit for damages was either an insufficient action, or not worth the effort, many others availed themselves of the courts in settling disputes over late arrivals.

In 1872 the extent of railway companies' disregard for the public demand of punctuality was already clear to one commentator. E.S. Beesly claimed that unless railway companies were made to pay for all unpunctuality, large and small, there would be no change in the manner of their operation. He suggested that railway companies submit weekly returns to the Board of Trade indicating the cumulative punctuality of their trains. They would then be penalized at an hourly rate for the total time delay they caused.⁶⁰ Not until 1889 were such measures taken to ensure that all unpunctuality was recorded and made public. On February 18, 1890 a report containing the punctuality of trains was presented in Parliament.⁶¹ By July of 1890, a standardized method of recording and publishing these figures had been developed by Member of Parliament, Arthur Baumann.⁶² Born in 1856, Baumann practiced law in the 1880s and was elected to the House of Commons in 1885 for Peckham, a district in southern London.⁶³ Given the location of his constituency, it is likely that railway unpunctuality was a common and unpleasant experience for Baumann himself and many of his constituents. *Punch*, in usual fashion, imagined what results the new report would yield and hinted that the preoccupation with punctuality erred on the side of extremity (Figure 2.1). It announced that in only thirteen weeks punctuality had been achieved as a result of penalties

⁶⁰ E.S. Beesly, "Railway Unpunctuality," *The Times*, October 11, 1872, 8.

⁶¹ "The Punctuality of Passenger Trains," *The Times*, February 19, 1890, 13

⁶² Arthur A. Baumann, "Railway Punctuality Explained," *The Times*, March 10, 1890, 12; "The Punctuality of Trains," *The Times*, September 16, 1890, 5; "Railway Punctuality," *The Pall Mall Gazette*, July 7, 1890, 7.

⁶³ Robert Henry Mair ed., *Debrett's House of Commons and the Judicial Bench* (London: Dean and Son, 1886), 10.

introduced in the legislation. It summarized the enforcement of these penalties alongside the number of trains late.

	<i>Trains late.</i>	<i>Chairmen put in Irons.</i>	<i>Directors sentenced to Penal Servitude.</i>	<i>Station Masters sentenced to Hard Labour.</i>	<i>Other Officials sent to Gaol and Fined.</i>
First week	1725	9	95	192	2004
Second, Do.	3	1	3	17	143
Third, Do.	2	..	2	11	88
Fourth, Do.	1	1	1	3	15
Fifth, Do.	1*
Sixth, Do.	1	1	2	5	10

Figure 2.1 - RAILWAY UNPUNCTUALITY REPORT.⁶⁴

Baumann’s reports defined punctuality within minutes of the posted arrival time. For July 1890, the railway punctuality report showed that only sixty-four percent of all trains arrived to their destination within three minutes of their listed arrival times. Furthermore, eighteen percent of trains were between five and ten minutes late.⁶⁵ In establishing acceptable limits within which a train could be deemed punctual, the railway punctuality report helped to establish a definition of timeliness. Furthermore, the classification of different periods of punctuality showed a spectrum of meanings and ways to classify being on time outside of railway travel.

The growth of passenger concern over punctuality during the late nineteenth century represented a nuanced discussion about acceptable social mores. The issue of class was a crucial factor in these negotiations, as unpunctuality and the availability of local trains became more common with the mandatory provision of cheaper fares for workers. More striking, however, was the role technology played in mediating the negotiation of social norms. The railway, clock time, and timetables were not simply loci for a wider discussion. Rather, they made this discussion possible and made it relevant to

⁶⁴ “Railway Unpunctuality Report; Or, What it may probably come to,” *Punch* 98, June 7, 1890, 268.

⁶⁵ “The Punctuality of Trains,” *The Times*, September 16, 1890, 5.

users, the number of whom grew steadily throughout the nineteenth century.⁶⁶ For those passengers who had yet to be offended by railway unpunctuality, it was possible to read about it in the periodicals they read while travelling.

While clocks and timetables were an influential part of defining mores concerning the use and waste of time via punctuality, information as subtle as the standards they employed had a significant impact on the passenger's awareness of time. Without the use of a unified time standard, defining punctuality and limiting it would have been exceedingly difficult. So as the railway heightened passengers' concerns over clock time through timetables and station clocks, each of these technologies contributed to a homogenization of clock time.

THE PROMISE OF UNIFORMITY - STANDARDIZING AND COORDINATING PUBLIC TIME

The introduction of frequent high-speed, long-distance transportation and the promotion of timetables facilitated the development of a heightened time-awareness among its passengers concerning punctuality. However, railway also contributed to the construction of new time standards. In 1874 an editorial in *The Times* revealed the heightened time-sense of Britons: "In these days we count hours, half and quarter hours too. It is an age of timetables, roll-cards, tell-tales and all the expedients for making a multitude a machine."⁶⁷ As timetables were a means of holding railways accountable and establishing acceptable values of punctuality, they were also part of the railway's own time discipline which aimed at unifying the time standards of passengers. Glennie and

⁶⁶ Simmons, 342. In 1871, Britons took 13.8 railway trips per capita; by 1891 this figure had jumped to 24.9 per capita.

⁶⁷ *The Times*, August 29, 1874, 9.

Thrift argue that clock times are formed in a particular temporal community.⁶⁸ However, the impact of an emerging clock time need not be limited to that community. Once time-keeping practices develop within a community to fulfill a specific need, they are often eventually adopted by outside groups. This was the case with the homogenization of clock times in Britain. The use of GMT as railway time played a major role in establishing its importance throughout Britain. Although railways and passengers justified the importance of using a single time standard in railway operations, the practice quickly extended beyond transportation demands and penetrated the daily lives of Britons. Through its use in railway timetables and station clocks GMT soon became the most practical time standard for Britons.

Decades before railways appeared in Britain, coach passengers noticed the change in local time as they travelled east or west. It was not until the faster, scheduled coaches appeared around 1800 that this became a problem.⁶⁹ Only in 1847 did the Post Office officially begin to operate its mail coaches and office by London time. From 1784, when it began running its mail service on a strict schedule, until 1847 mail coaches employed a complex system of time conversions to account for their arrival in the variety of local times they traversed.⁷⁰ By the time railways developed, faster speeds, longer distances, and lower fares brought this issue to a much larger portion of the population. As Hugh Robert Mill wrote in 1892:

⁶⁸ Glennie and Thrift, *Shaping the Day*, 9.

⁶⁹ Chapman, "Standard Time for All: The Electric Telegraph, Airy and the Greenwich Time Service," In *Semaphores to Short Waves: Proceedings of a Conference on the Technology and Impact of Early Telecommunications*, ed. Frank James (London: Royal Society of Arts, 1998), 40.

⁷⁰ Eviatar Zerubavel, "The Standardization of Time: A Sociohistorical Perspective," *The American Journal of Sociology* 88, no. 1 (1982), 6; Nigel Thrift, "The Diffusion of Greenwich Mean Time in Great Britain: An Essay on a Neglected Aspect of Social and Economic History" (working paper 188, School of Geography, University of Leeds, Leeds, 1977), 3.

[...] in pre-railway days every town, and every garden large enough to boast a sun-dial, set itself by its own local time. Railways have made the uniformity of time within narrow belts of longitude a necessity, and so largely does the railway affect modern civilized life that railway time soon comes to regulate all affairs.⁷¹

Time became important to both the passenger and the railway company. By 1848 most railways had adopted GMT as the standard operating time of their trains.⁷² According to Mike Esbester, even though early timetables did not include arrival times, they had to indicate whether they employed local time or GMT because they listed arrival and departure times down to the minute.⁷³ Although GMT would not be adopted as the legal time throughout England, Scotland, and Wales until 1880, railways and telegraphs were influential in constructing a national time from the middle of the century onwards. The establishment of Greenwich Mean Time as the national time standard in Britain was aided by its promotion in railway timetables, station clocks, and systems of distribution.

As early as 1849 George Biddell Airy, Astronomer Royal at the Greenwich Observatory, wrote that he had begun to conceive of a method of coordinating all the clocks at the observatory from one master clock. He imagined that it would be possible to make use of existing telegraph systems to distribute Greenwich time throughout Britain. One year later, after learning about the first submarine telegraph cable to cross the English Channel, Airy was determined to one day see Greenwich time transmitted around the world. By 1856 Airy had implemented his system of telegraphic time distribution so that a number of railway and public clocks in Britain would receive a time signal from Greenwich each day. This was the beginning of what J.A. Bennet has described as the

⁷¹ Hugh Robert Mill, "Time Standards of Europe," *Nature* 46, no. 1182 (1892), 175.

⁷² Howse, 88-89.

⁷³ Esbester, 97.

new social function of the Greenwich Observatory.⁷⁴ Airy himself remarked at his achievement, “I cannot but feel a satisfaction in thinking that the Royal Observatory is thus quietly contributing to the punctuality of business through a large portion of this busy country.”⁷⁵ Airy redefined the social function of the observatory as the distribution of time, and relegated its work in positional astronomy to a matter of prestige.⁷⁶ This being said, by 1873 Airy felt that his work in clock coordination had earned Greenwich an international reputation as the referent for all nations interested in distributing coordinated time.⁷⁷

Greenwich had begun distributing time to railways and private customers via the Electric Telegraph Company in 1852; however, there had been serious opposition to its widespread use in regulating civil affairs.⁷⁸ According to Derek Howse, Airy himself, despite his significant contributions to making the distribution of GMT possible, was in favour of preserving local times.⁷⁹ Airy seems to have preferred that upon receiving the noon time signal from Greenwich, clock five minutes east of Greenwich would set their clocks five minutes past noon. Although letters opposing the use of GMT outside of railway operations appeared in newspapers during the 1850s and local time was upheld as legal time until 1880, by 1870 opposition to the use of GMT was rare in *The Times*. The transfer of telegraph lines to government ownership provides evidence of the warming

⁷⁴ George Biddell Airy, *Autobiography*, ed. Wilfrid Airy (Cambridge: Cambridge University Press, 1896), 201, 204, 215; J.A. Bennett, “George Biddell Airy and Horology,” *Annals of Science* 37 (1980), 271, 284.

⁷⁵ Airy, 216.

⁷⁶ Jessica Ratcliff, *The Transit of Venus Enterprise in Victorian Britain* (London: Pickering and Chatto, 2008), 30.

⁷⁷ Airy, 302.

⁷⁸ According to Jeffrey Kieve, the Electric Telegraph Company lead the telegraph industry in Britain until the Post Office took over the operation of lines in 1870. Through their control of the infrastructure, they also controlled the distribution of GMT. Jeffrey Kieve, *The Electric Telegraph in the U.K.: A Social and Economic History* (New York: Harper and Rowe, 1973), 46.

⁷⁹ Howse, 91-92, 105-112.

attitudes towards GMT and contributed to its dissemination to locations that would have been unscathed by railway time.

The Telegraph Act of 1868 transferred the ownership of telegraph lines in Great Britain to the Post Office. The goal had been to widen public access to telegrams at a national standardized rate much like the penny post.⁸⁰ In February 1870 the transfer began. The price of inland telegram was set at a rate of threepence for every five words, and messages could be sent at any post office.⁸¹ Prior to this a telegraph company might only extend its services to towns where it could make a profit. The Post Office also began the practice of transmitting GMT to all of its offices daily at 10 o'clock.⁸² The Post Office brought outlying towns within the reach of electric communication and homogenized the time employed on messages sent to and from these towns.

Newspapers took the opportunity to tell their readers about the advantages of the transfer of responsibility and discuss the arrival of GMT throughout Britain. *The Western Mail* saw the upcoming changes as positive,

Nearly every nook and corner throughout the land will be within the easy reach of the magic wires; a great and important change it effected, and from it, as far as we can see at present, an undoubted benefit will accrue to the people of Great Britain.⁸³

Telegraph offices would be extended to every post office with reduced and equal fees, so Britons would now have access to telegrams where previously they had none, or could not afford them. In addition, Post Offices reinforced the use of GMT and became beacons of its dissemination. Upon announcing the upcoming changes *The Aberdeen Journal*

⁸⁰ The Telegraph Act, 1868, 31 & 32 Vict., c. 110. Interestingly, Kieve notes that prices had already dramatically reduced and accounted for a dramatic increase in the number of messages transmitted. In 1868 over 6 million domestic messages alone were sent. Kieve, 59, 73.

⁸¹ "The Post Office," *The Aberdeen Journal*, January 19, 1870, 8.

⁸² "The New-Telegraph System," *The Western Mail*, February 5, 1870, 7.

⁸³ *Ibid.*

stated eagerly “if the authorities would give us the benefit of a time ball, all the clocks of the town might be regulated daily by the Post Office Telegraph.”⁸⁴ The distribution of GMT to postal offices in England, Wales, and Scotland was a substantial initiative on the part of the government in encouraging uniformity and appears to have been promoted as an improvement.⁸⁵

Shortly after the Post Office assumed operation of the telegraph with the intent of distributing GMT to its offices, a short poem appeared in the periodical *Fun*, entitled “Railway Time.” It addressed Chronos, or Father Time, who in an accompanying illustration (Figure 2.2) had thrown his hour-glass away and was setting his pocket watch to railway time. Chronos had apparently missed his train because he failed to observe railway time. The poem instructed him that not only did railway time pervade daily life, but the railway and the telegraph which had brought this new way of life outpaced even Time himself.

Ho, old Chronos, what, left behind?
Missed your train! Oh, the notion’s prime!
Put on your watch, for now-a-day, mind,
We must all of us go by Railway Time! ⁸⁶

⁸⁴ “The Post Office,” *The Aberdeen Journal*, January 19, 1870, 8.

⁸⁵ “The Government Telegraphs,” *The Pall Mall Gazette*, January 28, 1870, 3; “The New-Telegraph System,” *The Western Mail*, February 5, 1870, 7.

⁸⁶ “Railway Time,” *Fun*, February 12, 1870, 227.



Figure 2.2 - RAILWAY TIME.⁸⁷

As GMT entered the public life of Britons, periodicals reminded their readers that the railway was responsible for this trend. In 1880, months before GMT was made legal time by Parliament *The Daily News* reported on the condition of Britain's time-keepers. "At every great railway terminus and every little country station throughout the island Greenwich time is exactly kept."⁸⁸ The report explained the use of a single time standard as a matter of practical necessity in a country of railways,

The fashion of keeping one railway time in each country is found absolutely necessary. The difference between the time of large towns in a small country like England is not so startling as that between London and Fiji, that is, from noon to midnight, but quite appreciable nevertheless.⁸⁹

⁸⁷ *Ibid* (© The British Library Board. P.P.5273.c.). Having been outpaced by the railway and telegraph, Father Time casts away his hour glass and sets his pocket watch to Railway time.

⁸⁸ "Greenwich Time," *The Daily News*, March 27, 1880, 2.

⁸⁹ *Ibid*.

Until the end of the nineteenth century, British periodicals associated time reform with the railways. They were usually presented as giving practical need for standardizing and coordinating time. Periodicals played an important role in generating public opinion over time reform. They published government press releases and were a forum for readers' comments and complaints.

In 1884 a considerable degree of publicity was given to the proposed adoption of a twenty-four hour clock. Greenwich had always employed a twenty-four hour day and beginning in 1885 it changed the beginning of the astronomical and naval day from noon in order to coincide with the civil day at midnight. Reports and commentaries in the press began to speculate as to whether public clocks would have to change to the twenty-four hour system and how people would adapt to such changes. Ever ready to wax satirical over current affairs, *Punch* imagined the public reactions to the twenty-four hour civil day. Among the half-dozen pieces they published in December 1884, which concerned the upcoming change at Greenwich was the revision of an old nursery rhyme:

Dickory, Dickory dock,
The Mouse ran up the Clock;
The Clock struck *Thirteen*,—
And the Mouse turned green
From the mere effect of the shock!⁹⁰

Articles like this in *Punch* and other papers revealed a sense of conservatism with respect to public time standards.⁹¹ Although Sanford Fleming had sought such a change in order to improve the railway experience for travellers, public sentiment in the British press contained a mixture of uneasiness and misinformation.⁹²

⁹⁰ "Tempora Mutantur," *Punch* 87, December 6, 1884, 268.

⁹¹ "A New Time-Table," *Punch* 87, December 20, 1884, 297; Kendal and Dent, "The New Method of Measuring Time," *The Times*, November 28, 1884, 10; "The Change in Recording Time," *The Times*, December 29, 1884, 4; "About the Time O'Day," *Funny Folks*, December 6, 1884, 388.

⁹² Blaise, 76-77.

In light of the concern that surrounded the Royal Observatory's new way of dividing astronomical day, Ainslie Common, Treasurer of the Royal Astronomical Society, wrote to *The Times* explaining that the change was intended to have no immediate impact on the civil day. In fact it was the Observatory's goal to align itself with the civil clocks. According to him, astronomers would not decide the time kept by public clocks; rather, the railway would be responsible for bringing such a system into public use.⁹³ Long after they had first introduced GMT in station clocks and timetables, railways were still directing the public's use of time. Contemporaries recognized the influence railways had on guiding the division of time and appealed to this common knowledge in order to avoid speculation over time reform.

Public recognition of this influence continued into the 1890s when the decision to construct public clocks was still justified by appealing to their use among travellers.⁹⁴ *The Times* reported that the need for clocks in the vicinity of stations and in theaters would benefit many but especially railway passengers:

The uneasiness that always sets in towards the end of a play with a portion of the 'house' as to the exact time left in which to catch the last train home, and the whispered requests for the time from some one who cannot, because of the lowered lights, see his watch, would be largely abolished.⁹⁵

Railways and telegraphs influenced significant changes in the distribution of standard time during the late nineteenth century. Public clocks were erected and connected to telegraph networks to keep them synchronized, and GMT soon became the legal time for Britain. Periodicals were aware of the impact these technologies were having on timekeeping and often praised them.

⁹³ A. Ainslie Common, "The New Method of Measuring Time," *The Times*, December 4, 1884, 13.

⁹⁴ "Clock Tower at Victoria," *The Times*, March 15, 1892, 12.

⁹⁵ "Clocks in Theatres," *The Times*, November 18, 1898, 12.

The trend of standardizing and coordinating clock times had long been attributed to railways and telegraphs, and by the end of the century the want of a homogenous clock time became a part of daily life. This undoubtedly had to do with the extensive impact of railways and telegraphs on other affairs as commuters, those whose business revolved around railways needed to coordinate their routines with rail traffic. Yet, while synchronization and standardization were theoretically and legally supposed to exist, the reality of the situation was that they had yet to be achieved by the end of the century. Whereas technological systems promoted the need for, and possibility of, such high degrees of coordination, the technology itself had yet to meet public demands. Indeed, it appears as though the very detailed attention to clock time—emanating from encounters with the railway and telegraph—which presented the desires for homogeneous time, also made passengers aware of the real lack of coordination which existed.

WHAT O’CLOCK IS IT? - PROBLEMS WITH SYSTEMS OF COORDINATION

Despite the great deal of publicity that surrounded the coordination of clocks and the standardization of time, these objectives had yet to be actually achieved by the 1880s.⁹⁶ So while the accuracy of clocks was emphasized in periodicals, time distribution systems and clocks which could not keep up to the demands of the public tended to reveal discord as much as synchrony. Ironically, clocks, railways, and telegraphs created a plurality of times which confused passengers while they were claiming to create harmony. As Glennie and Thrift note, “whilst clock time is clearly used to promote

⁹⁶ According to Hannah Gay, systems capable of satiating public demand for coordination did not event exist until the early twentieth century. Gay, 112.

regularity and control we cannot assume that, in a world of the unanticipated and the wayward, regularity necessarily happens and control is always achieved.”⁹⁷

Although British railway companies had unilaterally adopted GMT for their operations in 1848, in the 1880s station clocks were regularly erratic. The London and Brighton railway advertised its use of London time (GMT) on its line, yet one passenger noticed what he deemed to be great discord between its platform clocks. E. T. Hargraves noted that at various stations the clocks were as much as two minutes fast or slow, in one case there was a four minute difference between stations three miles apart.⁹⁸ It is not difficult to imagine passengers sitting in their carriages comparing the time on successive station clocks against their own pocket watch, and recording the differences in their diaries—in fact, this is exactly what they did when recording the unpunctuality of trains they rode in.⁹⁹ However, what is most striking about Hargraves’ letter was the degree of accuracy he expected in station clocks: “at the terminus, London-bridge, the clock was a quarter of a minute fast.”¹⁰⁰ Although it is difficult to know why some passengers began to demand such high degrees of accuracy, it was certainly the promise of instantaneous electrical-mechanical systems of coordination which made these demands realistic.

Not only did railways present the need for unified time standards, they also made it possible to realize the failure to keep the right time. As passengers compared their own watches to the many station clocks they encountered during commutes or excursions, discrepancies became apparent. So while railways certainly facilitated the development of a heightened sense of clock time and the need for coordination, they also made it more

⁹⁷ Glennie and Thrift, *Shaping the Day*, 75.

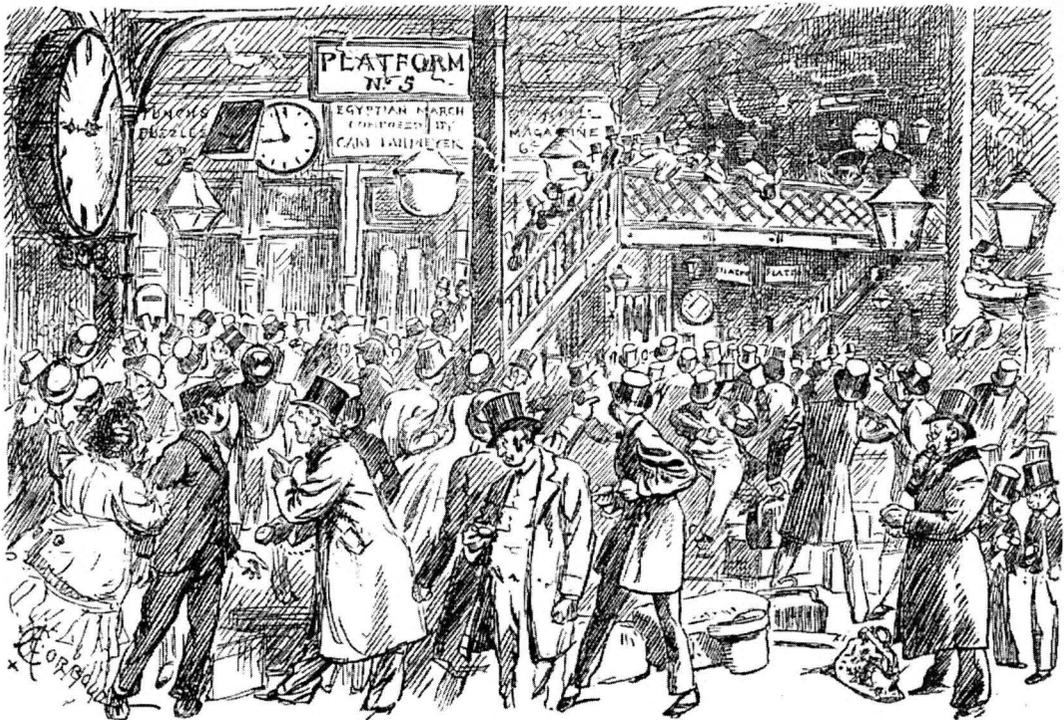
⁹⁸ E.T. Hargraves, “Railway Time,” *The Times*, August 19, 1884, 10.

⁹⁹ Late, Shaken, and Weary, “The London and South Western Railway,” *The Times*, August 18, 1870, 5; A Former Resident on the Line, “The London and South-Western Railway,” *The Times*, August 20, 1870, 6; A Season Ticket Holder, “Railway Unpunctuality,” *The Times*, September, 19, 1895, 4.

¹⁰⁰ E.T. Hargraves, “Railway Time,” *The Times*, August 19, 1884, 10.

likely that discord would be detected. When accuracy and standardization were advertised, passengers expected it, much in the same way they expected arrival times to be accurate.

Again *Punch* added to the discussion of clock time by satirizing the confusion that existed at railway stations three years after clock times in Britain were legally supposed to be GMT and more than thirty years after the railway clearing house adopted GMT officially. In 1883 *Punch* depicted a scene at Waterloo station filled with confused travelers and discordant clocks. Even railway stations were having difficulty keeping their own clocks in harmony.



METROPOLITAN PRIZE PUZZLES. No. 7.
TO KNOW THE RIGHT TIME AT WATERLOO STATION.

Figure 2.3 - FINDING THE RIGHT TIME.¹⁰¹

¹⁰¹ "Finding the Right Time," *Punch* 85, August 18, 1883, 77. A close look reveals that clocks in this illustration vary as much as a thirty minutes. Despite the claim of coordination and standardization, passengers still encountered a plurality of clock times into the late nineteenth century.

While the use of a single railway time standard promoted the homogenization of clock times in Britain, it also brought passengers into greater contact with a multiplicity of time standards used at local stations and in timetables. According to Hannah Gay, “[t]he fact that the railways adopted Greenwich time does not imply that all their passengers did so. Local times were still in use, and confused railway passengers into the early twentieth century.”¹⁰² Indeed, the introduction of Greenwich Time in the railways initially caused some confusion among passengers and the habit of attaching a second minute hand to many public clocks was adopted by mid-century so that local time and railway time co-existed. However, this tended to create as much confusion as it solved and local time was eventually removed from many public clocks.¹⁰³ Bringing many time standards within the reach of one individual may have undermined the ability to choose one over another. In any case, much like the railway, the telegraph brought its users into contact with a plurality of times.

Although railways employed GMT from 1848 onwards for their operations, tables varied by which time standard they employed. While Mill suggested that local times had disappeared to some extent, he understood that uniformity was not a reality,

[...] there exists in the United Kingdom a diversity as illogical as that which formerly reigned in the States of Southern Germany... Even so eminently practical a work as ‘Bradshaw’s Railway Guide’ contains month after month a map graduated on the margin to show the difference of time between Greenwich and the rest of England, leaving it to be implied that the local time thus shown is actually employed.¹⁰⁴

¹⁰² Gay, 121.

¹⁰³ Editorial, *The Times*, October 2, 1884, 9; Gay, 126; Howse, 111. Howse includes a photograph of the Christ Church clock in Oxford circa 1860 with such a setup.

¹⁰⁴ Mill, 175-176. *The Times* reported in 1883 that Mill’s charts “tend to give clear ideas of longitude, of the earth’s diurnal revolution, of time itself. Meridians, as such, are mere co-ordinates of position and have no necessary connexion with time, and the ideas of many even educated people are extremely hazy on their mutual relations... thanks to the great circulation of ‘Bradshaw,’ [they are] helping to prepare the public mind for the adoption of a universal first meridian.” “Time Meridians,” *The Times*, October 25, 1883, 10.

This problem presented itself to others. One individual argued that legislation ought to require railway timetables be published no less than four days before changes took effect, and the times listed in these tables be London (Greenwich) mean time.¹⁰⁵ While railways had made considerable strides in homogenizing the clock times in Britain, discord existed into the end of the century. By 1880 the problem of which time standard to use became a legislative issue, as legal time was still defined as the local time of the town in question.¹⁰⁶ Although railways operated on a single time standard, they brought passengers into greater contact with a plurality of times with the aid of timetables.

Telegraphs formed the basis of the time distribution networks. They made possible the claims of accuracy and the expectations of coordination which they were unable to fulfill. In addition to revealing a plurality of times in the discordant clocks they were supposed to regulate, the extension of telegraph networks in the 1860s and 1870s through submarine cables re-presented the telegraph as the time-annihilating technology it had been in the 1840s. From the beginning of the telegraph's use, its ability to send messages faster than time made appearances in anecdotes in various periodicals. The following appeared in *Mechanics' Magazine* in 1845:

We have heard of things being done "in less than no time," and always looked on the phrase as a figure of speech signifying great dispatch. This paradox seems, however, to have been actually realised in the case of Wheatstone's Great Western Telegraph, a message having been sent in the year 1845, and received in the year 1844,... as the new year had not yet arrived at Slough! Such indeed was the fact, for "panting" Time was matched against Professor Wheatstone, and beaten half a minute.¹⁰⁷

This early anecdote matching the telegraph against time suggests that some contemporaries felt the telegraph appeared to dominate time. Similar sensational accounts

¹⁰⁵ Q.C., "How to Make Railways Punctual," *The Times*, October 19, 1872, 10.

¹⁰⁶ Clerk to Justices, "Time, Actual and Legal," *The Times*, May 14, 1880, 10.

¹⁰⁷ "Time, and the Electric Telegraph," *Mechanics' Magazine* 42 (1845), 416.

appear throughout the 1870s suggesting that the telegraph may have still been annihilating time in the eyes of contemporaries.

By the 1870s telegraph networks had significantly expanded. Submarine cables connected Britain not only to continental Europe, but also North America and India. In 1871 an article in *The Times* entitled “Telegraph v. Time” boasted of the accomplishments of the global telegraph network. It reported that a “message was sent from Calcutta at 11 50 a.m. on January 9, and reached London at 10 50 a.m. on the same day, thus, owing to the difference of local time, anticipating the period of its despatch.”¹⁰⁸ Not two months later a similar report appeared in *The Times* exclaiming the feat of telegraphy in its title, “The Sun Outdone.” According to the report, a message had been sent from India on Friday and was received in London on Thursday, “[t]he time actually occupied by the message in transmission was 50 minutes; the sun would require four hours and 26 minutes to do the same distance.”¹⁰⁹ As networks expanded transmission became instantaneous as reports only one month later indicated. *The Times* reported to its readers that on April 8, 1871 instantaneous transmission between London and Bombay was first achieved. The message travelled a distance of 6,000 miles without being retransmitted at stations between, and was instantaneously acknowledged.¹¹⁰ The telegraph had brought India and London into simultaneous communication and in the process destroyed their spatio-temporal independence. While the telegraph’s ability to defeat the sun and time was a technological feat to be marveled at by contemporaries, it made local times around

¹⁰⁸ “Telegraph v. Time,” *The Times*, January 11, 1871, 5.

¹⁰⁹ “The Sun Outdone,” *The Times*, February 20, 1871, 20. Not all reports compared the speed of telegraphs to the sun or emphasized the receipt of a telegraph before it was sent, even though such information was implicit in the report. *The Times* commented on March 22, 1871, that a telegram sent from Jerusalem to London required only twenty minutes to be transmitted, being sent at 5:00 p.m. and received at 3:20 p.m. in London (there being a 2 hour 20 minute time difference between the two cities). “A Feat of Telegraphy,” *The Times*, March 22, 1871, 12.

¹¹⁰ “A Telegraphic Feat,” *The Times*, April 10, 1871, 10.

the globe a relevant issue. In 1873 a chart comparing global time standards appeared in *The Times*, which the editors deemed “will be found useful in connexion with the receipt and despatch of European telegrams.”¹¹¹

Sensational accounts of the telegraph continued to appear throughout the 1870s with the extension of submarine telegraph cables. These anecdotes repeated the earlier ones, which commented on the ability to receive a message before it was sent. Humorous comments like “Why this message was sent off tomorrow,” appeared in newspapers and confirmed the advances being made in global communication.¹¹² However, they also presented readers with the multiplicity of times, which could be encountered. It demonstrated that users of the technology could receive messages hours before they were sent.

CONCLUSIONS

During the late nineteenth century, railway and telegraph networks presented new practical issues to their users. This chapter has argued that railways presented the opportunity for users to develop a heightened awareness of clock time. This possibility was fostered by passengers’ emphasis on speed, regularity, and punctuality of service. Railways influenced a new experience of time by changing the conditions of travel. Although railway companies sought out a rational time standard by which to coordinate their business, passengers did not always follow suit by making railway time their own.

¹¹¹ “Time at the Antipodes,” *The Times*, February 13, 1873, 5. In 1882 *The Times* also reported on “an invention by which the corresponding time all over the world at any given moment is shown.” “Horologium,” *The Times*, May 29, 1882, 9.

¹¹² “Time and the Telegraph,” *The Times*, October 31, 1878, 9.

When passengers did adopt railway time, they quickly understood that the standardization and coordination which had been heralded in the press did not exist.

Railways, telegraphs, and their accoutrements presented a landscape in which a tripartite problem developed for users. First, they created the possibility for increased passenger concern over clock time. Second, as a byproduct of this heightened concern for public time measures, passengers adopted the unified systems which railways and telegraphs promoted. Finally, and again a product of their increased sensitivity to timekeeping, passengers discovered that uniformity and coordination did not exist. These electro-mechanical networks simultaneously promoted synchrony and asynchrony.

When passengers discovered asynchrony and unpunctuality they took up the pen, writing to newspapers to expose these injustices, or they went to the courts. Through these efforts, users of technology contributed to a public debate which primarily concerned the cultural norms about time. Although the negotiations over railway punctuality, time standards, and systems of coordination were taken up by individuals, technological systems were as much a part of these debates as were humans. In changing the very conditions of travel and communication, railways and telegraphs made the concern over clock time and punctuality more relevant to a wider segment of the population. Timetables and clocks themselves communicated punctuality, time standards, and the presence or absence of synchrony, to individuals. Indeed, they held considerable means of communicating with and educating passengers. The same must also be said of the print media which recorded these debates and which railway passengers read while travelling on or waiting for a train. In many ways print participated in debates about time.

While this complex relationship between technology, time, and users was presented in newspapers and satirical periodicals like *Punch* and *Fun*, printed materials went beyond merely communicating passenger concerns, or satirizing immediate practical issues. These issues which presented themselves to passengers were also picked up in philosophical debates about timekeeping, and the experience of time which railway travelling. They were also picked up in works of fiction.

CHAPTER THREE: THE TEMPORAL IMAGINATION - TIME-DISCIPLINE AND USERS OF TECHNOLOGY IN FICTION

As to the neighborhood which had hesitated to acknowledge the railroad in its straggling days, that had grown wise and penitent, as any Christian might in such a case, and now boasted of its powerful and prosperous relation. There were railway patterns in its drapers' shops, and railway journals in the windows of its newsmen. There were railway hotels, coffee-houses, lodging-houses, boarding-houses; railway plans, maps, views, wrappers, bottles, sandwich boxes, and time-tables... There was even railway time observed in clocks, as if the sun itself had given in.

Wonderful Members of Parliament, who, little more than twenty years before, had made themselves merry with the wild railroad theories of engineers, and given them the liveliest rubs in cross-examination, went down into the North with their watches in their hands, and sent on messages before by the electric telegraph, to say that they were coming.¹

In the passages above from *Dombey and Son* (1848), Charles Dickens related how by mid-century, early railway skeptics had not only been converted but swathed in the railway's accoutrements. Writing when most railway companies were adopting Greenwich Mean Time for their operations and stations, Dickens was quick to observe how the railway had helped to undermine the use of local time. Punctuality was imperative to railway travellers so as not to miss a train, so too became setting one's watch to the time of station clocks. Echoing the chronic preoccupation of many of his contemporaries, Dickens described one character as having "a tremendous chronometer in his fob, rather than doubt which precious possession, he would have believed in a conspiracy against it on the part of all the clocks and watches in the city, and even of the very sun itself."² In *Dombey and Son* railways appear to have a certain menacing aura about them. Dickens illustrated trains as "fiery devil[s]," or "conquering engines," which made "the walls quake, as if they were dilating with the secret knowledge of great powers

¹ Charles Dickens, *Dombey and Son* (New York: John W. Lovell Company, 1883), 227.

² *Ibid.*, 43.

yet unsuspected in them, and strong purposes not yet achieved.”³ For Dickens, the railway as technology could be oppressive and destructive while at the same time creating new and positive opportunities.

Dickens’ account of the railway in *Dombey and Son* is but one instance of how technologies entered nineteenth-century fiction. Novels and poetry are valuable sources of commentary on the changes—positive or negative—wrought by the material progress of British industry. Writers who experienced these changes incorporated them into their literary work. According to Laura Otis, these authors were as much interested in the facts they presented about science and industry as they were in the fictional characters and settings they used to communicate their message. This message was often directed at explaining the human condition in the wake of the progress of the sciences and industrialization.⁴ Novels, short stories, and poems offer insight into how technologies were changing the time-awareness of late nineteenth-century Britons. Although in many ways, these later writers reaffirmed Dickens’ concerns, technology continued to pervade fiction during the late nineteenth century and so did time.

This chapter explores time and technology in late nineteenth-century fiction. It aims to understand how authors interpreted the increasing importance of time reckoning alongside industrial technological systems. According to Colin Manlove, excepting Kipling, when authors included technology in nineteenth-century fiction, it was seldom integral to the work as a whole.⁵ However, a number of fictional texts were published throughout the second half of the nineteenth century in which technology was used to

³ *Ibid.*, 227-228, 770.

⁴ Laura Otis ed., *Literature and Science in the Nineteenth Century: An Anthology* (New York: Oxford University Press, 2002), xxiii, xxvi.

⁵ Colin Manlove, “Charles Kingsley, H.G. Wells and the Machine in Victorian Fiction,” in *H.G. Wells*, ed. Harold Bloom (Philadelphia: Chelsea House Publishers, 2005), 11.

create a setting or instigate problems. Among those who contributed in these ways to a cultural expression of the relation between time and technology were Thomas Hardy (1840-1929), Rudyard Kipling (1865-1936), Mary Howarth, and H.G. Wells (1866-1946). A particular dynamic between technologies and users appears in their work. They also show how precision clocks, railways, and telegraphs influenced non-users. There was not one inclusive response to railways and telegraphs during the nineteenth century; rather, users fashioned different meanings of these systems through their encounters with them. For non-users, these systems were still present, but afforded a different set of experiences. According to Iwan Rhys Morus, technology “only annihilated time and space for its users while leaving others still constrained by conventional spatio-temporal limitations.”⁶ Only those who were regularly engaged with the railway and telegraph could experience the new space-time orientation these systems engendered. Others would have likely read the sensational accounts proclaiming the death of space and time, but to know it was to experience it directly.

Although a great deal of variety exists in their approach to the problem of time, some late nineteenth-century writers made explicit connections to the increasing importance of time-awareness in the experience of technology. By the late nineteenth century much of the initial fear had been quelled. Technology and time were employed by Wells and Hardy to create new literary worlds. For Hardy, the railroad marked a boundary between the modern, fast-paced, temporally-disciplined metropole and the rural Wessex within which he set his novels. Throughout the series of Wessex novels he wrote between 1874 and 1895, the railway was used to create Wessex and its inhabitants who

⁶ Iwan Rhys Morus, “‘The Nervous System of Great Britain’: Space, Time and the Electric Telegraph in the Victorian Age,” *The Journal for the History of Science* 33, no. 4 (2000), 462.

saw the railway as something foreign, though not necessarily menacing. Yet, while the inhabitants of Wessex interacted with the railway, they would not be considered users. Hardy used this distinction to create a divide between the urban and rural settings where industrial technologies appeared occasionally but had not yet been entrenched into the rhythms of daily life.

Conversely, in *The Time Machine* (1895) Wells employed the technological advances of the nineteenth century to give his protagonist control over time. Technology was a literary device which allowed him to imagine new possibilities of travel. For Wells, time was not unlike space, and machines could be constructed to give users the same possibilities of moving in time that railroads, balloons, and telegraphs had provided in space. However, while contemporaries had proclaimed the death of time, Wells' inventor discovered that time cannot be subdued by machines.

While Hardy and Wells used technology in their writing to create new temporal settings, others, much like Dickens, directly engaged the issues that railways and telegraphs revealed only to users. For Kipling, the relationship between punctuality and the railroad was a cultural phenomenon in Britain that could not be understood by foreigners. Mary Howarth related how the telegraph had changed the spatial and temporal relationship of events in Britain and complicated the dissemination of news. Both Howarth and Kipling identified how technologies complicated the lives of users when cultural norms were not observed. In each case confusion and disarray ensued as a result of user error. Whereas technologies failed to provide accurate time coordination to suit demand, users who did not uphold cultural norms were just as guilty.

COMPLICATING THE PRESENT - ENGAGING THE TEMPORALITIES OF TECHNOLOGY

As discussed in Chapter Two, late nineteenth-century newspapers were a medium for expressing contemporaries' concerns about punctuality, clock accuracy, and the plurality of time standards which industrial technologies presented to the public. The new speed of communication and transportation achieved by harnessing steam and electricity extended the possibility of a user's reach. During the 1860s and 1870s being a railway passenger and sending and receiving telegram became a possibility to more people than ever. The increase in workman's and parliamentary trains made rail travel affordable for the working class. Similarly, the government ownership of telegraph lines and the standardization of fees beginning in 1870 made telegrams more physically and financially accessible.

With the aid of the telegraph, and later the telephone, one could figuratively be in two places at once. In one sense, as David Harvey has argued, this change was accompanied by a feeling of time-space collapse, wherein the perceived dimensions of space were drastically reduced.⁷ At the same time, this also created the feeling that one's personal spatial limits were greatly extended. Through the late nineteenth century Britain's global network of land and sea telegraph cables progressively connected its empire and increased the possibility and scope of this experience.⁸ As concerns over punctuality and timetables had increasingly honed Britons' awareness of clock times, the standards of other clock times became a growing concern. While these matters were

⁷ David Harvey, *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change* (Cambridge: Basil Blackwell, 1989), 240.

⁸ Rooney and Nye, 7. For a detailed discussion of Britain's global telegraph network see chapter four of: Daniel Headrick, *The Tentacles of Progress: Technology Transfer in the Age of Imperialism, 1850-1914* (New York: Oxford University Press, 1988).

commonplace topics of concern in newspapers of the period, Britons also responded to these issues by discussing them in works of fiction and using them to construct plots and settings in order to express other concerns. The appearance of technological problems in short stories, poems, and novels suggests they were more than simply practical concerns about efficiency and orderliness, but had become part of a cultural phenomenon.

In contrast with the railway, the impact of the telegraph network on daily life in Britain was relatively slow. Only after the operation of telegraph lines had been taken over by the Post Office in 1870, and more affordable rates were introduced, did public exposure become commonplace.⁹ Early commentary on the telegraph was for the most part sensational, and much of the sensation surrounding it had to do with how quickly information could be relayed. According to Iwan Rhys Morus, “Victorians celebrated the telegraph for its capacity to make their world smaller and more immediately manageable.”¹⁰ While the presence of this sensationalism in newspapers has been discussed in Chapter Two, similar references to the conquest of time were included in late nineteenth-century fiction. The perceived reduction of the traditional space-time dynamic was expressed much in the same way that earlier commentators had envisaged the impact of the railway—space and time were under siege.

Both the possibility of communication offered by the telegraph and its attack on time and space were the subject of *Punch's* commentary upon the completion of the submarine telegraph connection between Bombay and London in 1870. The achievement of global communication presented new possibilities which challenged previous orientations towards time and space. *Punch* gloried in these new possibilities.

⁹ Richard Menke, *Telegraphic Realism: Victorian Fiction and Other Information Systems* (Stanford: Stanford University Press, 2008), 70, 77.

¹⁰ Morus, 456.

So doth the spark of our wires outpace e'en the fleet foot of Chronos!
Miracle-workers are we—sitting here in the mansion of Pender,
Gossiping thus, at our ease over Continents, Hemispheres, Oceans,
Saying to space “Be no more,” and to baffled Time, “Get thou behind
me!”¹¹

While such commentaries were sensational in the sense that they were reacting to new technological achievements they indicate a lasting trope for discussing the telegraph in print culture. Indeed, for Victorians it became “commonplace to assert that the telegraph had ‘annihilated time and space.’”¹² Rudyard Kipling’s poem “The Deep-Sea Cables,” which appeared in a collection entitled *A Song of the English* (1896), illustrates that these sentiments were sustained throughout the late nineteenth century. The submarine telegraph cable represented the movement away from traditional time notations. Kipling wrote “[t]hey have wakened the timeless Things; they have killed their father Time; Joining hands in the gloom, a league from the last of the sun.”¹³ Transmitting messages beyond the reach of sunlight “in the womb of the world, “on the tie-ribs of earth,” the telegraph paid no heed to the time of day told by the sun and allowed seemingly instantaneous communication around the world.¹⁴

At the same time that Kipling waxed over the most apparent impacts of the telegraph, the technology was becoming more widely diffused among the population. This was reflected in how writers discussed the telegraph in their fiction. It became less common for authors to treat the telegraph as novel; instead they presented the realities of

¹¹ “Tempus Fugit,” *Punch* 59, July 9, 1870, 20. John Pender was chairman of the British India Submarine Telegraph Company. He ordered the construction of the submarine cable to India in 1869. By 1914 the Penders owned two-thirds of all British submarine cables and two-thirds of all cables in the world. Headrick, *Tentacles of Progress*, 101, 105.

¹² Morus, 456.

¹³ Rudyard Kipling, “The Deep-Sea Cables,” in *A Song of the English* (New York: Doubleday Page & Company, 1909).

¹⁴ *Ibid.*

a growing familiarity with the technology.¹⁵ Among the realities that became part and parcel of the telegraph was the possibility of two distant places being co-present in one social time. Not only was this the case literally with the diffusion of standard time via telegraph, but social interactions were brought together into a single time frame that would have been otherwise impossible.¹⁶

Mary Howarth's short story "The Telegram" (1895), which appeared in *The Pall Mall Gazette*, demonstrates how the telegraph complicated the interactions of its users by annihilating the distance between places and the time previous forms of communication would have demanded. Howarth had been the chief editor of a women's paper before 1896 when she began editing a new section of the *Daily Mail* designed to appeal to female readers.¹⁷ As an editor and journalist, Howarth would have been aware of the benefits which telegrams could offer for gathering and disseminating news quickly. She may also have had experience with some of the complications these technologies could raise. Howarth's story relates the problems of rapid communication and the implications of errors in telegrams sent or received. She shows how the telegraph effectively distinguished the social and physical time-space of its users, and allowed them to be present in more than one place.¹⁸

Horace Keith, a journalist and editor of his father Mark Keith's paper *The Meteor*, receives a telegram from a friend, Lawrence Morris. An artist, Morris had traveled from London to secure the final details for a portrait of Lord Danvers, the Prime Minister and estranged step-brother of Mark Keith. Aware that Morris was traveling to see Danvers,

¹⁵ Menke, 164.

¹⁶ Mussell, 204.

¹⁷ Adrian, Bingham, *Gender, Modernity, and the Popular Press in Inter-War Britain* (Toronto: Oxford University Press, 2004), 27.

¹⁸ Menke, 74; Mussell, 205.

who was quite ill, Horace asked him to telegraph in the event that Danvers died during his visit so that he might have the news before any of the other London papers. On the evening of publication, Horace received a telegram stating “Danvers is dead!” Immediately, Horace stopped the presses and inserted a scathing obituary composed by Mark when the Prime Minister’s illness was first announced. Unbeknownst to Horace, the telegram contained an error and should have read “Danvers is done,” in reference to the portrait Morris had been commissioned to paint.¹⁹ Despite a warning from another employee, Horace neglected to have the telegram repeated—as was customary—to avoid mistakes such as this. His failure to observe standard practices precipitated the confusion that would follow.

Upon recognizing the error on Morris’ return from Brighton that same evening, Horace telegraphed his father, who had also been in Brighton, for advice on how to proceed. However, prior to receiving this notice from his son, Mark reconciled with his dying brother. When he returned to his hotel to see the papers and receive his son’s telegram he raced back to his brother hoping to explain and ask forgiveness. Arriving at the door he found that Danvers had died only five minutes after he had left.²⁰

“The Telegram” demonstrates the problems that could occur as a result of the railway and telegraph’s annihilation of space and time. The story itself is set simultaneously in London and Brighton, which are able to inhabit the same social space and time. However, at the same time, the error in the first message and the physical distance which separates the two scenes allows for two truths about the Prime Minister’s health to exist. The story also points to Iwan Rhys Morus’ observation that it was only

¹⁹ Mary Howarth, “The Telegram” *The Pall Mall Magazine* 6 (1895), 355-364.

²⁰ *Ibid.*, 364.

users of technology who experienced the annihilation of space and time.²¹ Indeed, the desire to take advantage of this new reality was the primer for the misunderstanding. Having asked Morris to relay news of Danvers' health, Horace never thought to have the telegram re-sent to check for error. At the same time, those who were unaware of the mistake were in a sense still constrained by a conventional space-time orientation, so that the falsity of the *The Meteor's* report would never be revealed. "The Telegram" shows how the possibility of sending information without the constraints of physically transporting it created new complications for its users.²²

While Howarth's story depicted an error arising out of the telegraph, Rudyard Kipling related an error concerning the British mores of railway operation. Kipling celebrated technological advance where it appeared in his fiction, and according to Christopher Harvie this was indicative of his "commitment to an alternative interpretation of society and its control by the selection and management of appropriate technology."²³ Harvie suggests that such works as "Bread Upon the Waters" and "The Sons of Martha" reveal Kipling's attitude towards new social relations necessary to live alongside machines.²⁴ Kipling's short story, "An Error in the Fourth Dimension," (1894) provides a clear example of this. In this story Kipling employs the railway as the locus for a conflict between national identities and suggests contemporaries understood their heightened time-awareness was characteristically British. The story itself includes no blatant explanation for its title. However, commentators have discussed Kipling's use of the fourth dimension in connection with H.G. Wells to argue that higher dimensional space

²¹ Morus, 462.

²² Menke, 74.

²³ Christopher Harvie, "'The Sons of Martha': Technology, Transport, and Rudyard Kipling," *Victorian Studies* 20, no. 3 (1977), 270.

²⁴ *Ibid.*, 276, 282.

was a topic of popular parlance in the late nineteenth century in matters of the occult and spiritualism.²⁵ Kipling's title is more likely a reference to the cultural norms of railway punctuality which his protagonist violates. For Kipling, as for Wells, the fourth dimension was temporal.

Although the story has been cited as an example of Kipling's growing anti-American sentiments, it demonstrates that the issue of railway punctuality was an enigmatically British phenomenon, incomprehensible to even the most enthusiastic anglophiles.²⁶ The story relates the experience of Wilton Sargent, an American railway tycoon who, having a fondness for everything British, fled to England where he took pains to rid himself of all American habits. There he purchased a large country estate which bordered on the tracks of the Great Buchonian railway company. Despite his success in purging his American accent and customs, his encounter with the railway revealed a great divide between British and American dispositions.

Desirous of settling a dispute, and hoping to avoid the trip to the nearest station which lay five miles way, Wilton decided to make a return trip to London and flagged down a London-bound train which crossed his property.²⁷ The gravity of this offense was incomprehensible to Wilton and litigation began between himself and the railway company.²⁸ The omniscient and authoritative narrator explained the nature of Wilton's error and yet Wilton still had little understanding of what he had done.

²⁵ Tom H. Gibbons, "Cubism and 'The Fourth Dimension' in the Context of the Late Nineteenth-Century and Early Twentieth-Century Revival of Occult Idealism," *Journal of the Warburg and Courtauld Institutes* 44 (1981), 132; K. G. Valente, "'Who Will Explain the Explanation?': The Ambivalent Reception of Higher Dimensional Space in the British Spiritualist Press, 1875-1900," *Victorian Periodicals Review* 41, no. 2 (2008), 124, 143

²⁶ For a reassessment of Edmund Wilson's claim that the story was a manifestation of Kipling's anti-Americanism see: Donald L. Hill, "Kipling in Vermont," *Nineteenth-Century Fiction* 7, no. 3 (1952), 157-158.

²⁷ Rudyard Kipling, "An Error in the Fourth Dimension," in *The Day's Work* 5th ed. (New York: Doubleday and McClure Co., 1898), 341-2.

²⁸ *Ibid.*, 345.

‘Good heavens, Wilton, you *have* done it!’ I giggled, as I read on... ‘But it’s *the* three-forty—the Induna—surely you’ve heard of the Great Buchonian’s Induna! ...*the* one train of the whole line. She’s timed for fifty-seven miles an hour. She was put on early in the Sixties, and she has never been stopped—.’²⁹

In response to these admonitions Wilton merely commented that since the train had never been stopped, it was about time it had been.

The story reaches a climax in an exchange between Wilton, his friend the narrator, and two representatives of the Great Buchonian. Unaware that Wilton Sargent was an American, or a railway magnate, the railway directors suspected he was delusional for having attempted to board the train. They demanded he construct a stone wall along his property in order to deter future attempts at disrupting traffic. With the discussion having reached a deadlock, the narrator explained Wilton’s nationality and everything fell into place. That he was wealthy and owned a considerable share of his country’s railways seemed to make little difference. Rather, his nationality provided the Buchonian with justification for the mishap.

Of course; of course. He is an American; that accounts. Still, it *was* the Induna; but I can quite understand that the customs of our cousins across the water differ in these particulars from ours. And do you always stop trains in this way in the States, Mr. Sargent?³⁰

After properly identifying Wilton as an American the issue was resolved for the railway company. Its directors ended litigation and assumed there would be no further stoppages as Wilton had not been educated on British railway customs. Angered by the whole ordeal, Wilton speedily returned to the United States.

²⁹ *Ibid.*, 346. Author’s emphasis.

³⁰ *Ibid.*, 357.

Kipling's story is an account of cultural misunderstanding of customs related to technology. While Wilton attempted to adopt an English persona and was successful in doing so, he was unable to comprehend the import of punctual express trains. It is unclear whether Kipling intended to present Wilton's actions—and the exchange which ensued—as the result of an American or a British shibboleth. In the former case, the story might portray Americans as regularly interrupting trains to serve their own immediate needs in order to accommodate what the one representative called their tendency to be in a hurry. Kipling had Wilton admit that though this was his first attempt to stop a train in either Britain or America, he simply had never felt the need to before.³¹

The chief cause of the conflict in Kipling's story is arguably a fundamental difference in the attitude towards railways in Britain and the United States. Wilton as the sole owner of his railway holds little regard for delaying the traffic on his lines, or that of his acquaintances.³² In contrast, the Great Buchonian's directors were mainly concerned with the public guarantee they owed their passengers. Such a stoppage would not only delay the train in question, but slow the movement of all trains on the line. The punctual operation of the entire system would be at risk. Along these lines, Donald L. Hill has commented that “[t]he railroad is a symbol of the sacred routine of British life. Not disturbed, it operates without commotion behind the scenes; its disturbance sets everyone in a flutter.”³³ By the late nineteenth century, the duty of railway companies had been decided in court cases where they were being held liable for expenses incurred as a result of the delay of their trains. Kipling's story emphasizes a cultural divide exemplified in

³¹ *Ibid.*, 357-358.

³² *Ibid.*, 347.

³³ Hill, 167.

the norms of British railways.³⁴ Given the concerns over railway punctuality discussed in late nineteenth-century newspapers, an error such as Wilton's was an offense to the cultural values which regulated the interactions between institutions and individuals. By disrupting the express he upset the timetables and slowed the progress of other traffic on the line.

Kipling emphasized how railway punctuality was a culturally defined phenomenon. Individual attitudes towards the operation of railway were highly dependent on cultural values about these institutions. Similarly, Howarth emphasized that users of telegraphs had access to experiences which others did not. In each case, failure to follow norms within a community of users had the potential to end in disaster. While these stories reveal users' experiences of technology and the temporal norms and complications they encountered, they do relatively little in the way of showing how non-users understood nineteenth-century technological systems. Several of Thomas Hardy's Wessex novels point to one interpretation of how rural communities would have perceived industrial technologies.

HARDY, WESSEX, AND THE PACE OF RURAL LIFE

Between 1870 and 1900 many of Thomas Hardy's works were set in Wessex. According to the preface of Hardy's *Far From the Madding Crowd* (1874), he based the region on the area known as Wessex the time of the Norman Conquest of England. It was in this work that he first adopted the title Wessex and began constructing the setting for his later novels.³⁵ Though fictional, the cities and geography of Hardy's Wessex were

³⁴ Harvie, 275.

³⁵ Thomas Hardy, *Far from the Madding Crowd*, ed. Robert C. Schweik (New York: W. W. Norton & Company, 1986), 5.

based on those of southwest England. Hardy's characters lived in a world largely founded in the architecture and geography of the countryside he grew up in. He presented the Wessex he knew and lived in throughout his novels. At the time of his birth, railways had yet to reach his native Dorset. As a child he witnessed the entrance of the railway into south-west England and it undoubtedly had an influence on his fiction. Birgit Plietzsch writes that Hardy depicts the railway as having a slow and gradual impact on ways of life in rural England as opposed to the rapid changes which took place in urban centers.³⁶ Hardy's depiction of Wessex provides an idea of the connection he saw between the railroad and the time-awareness of rural populations. The railway brought with it modern accoutrement Dickens described in *Dombey and Son*, and Wessex had yet to be brought into the fold. Instead its inhabitants lived a slower life in which clock time was relatively unimportant.

More than a literary embellishment, Hardy's semi-fictional setting presented many of the realities of provincial encounters with railways. As late as the 1860s, railway traveller's guides gave instructions on how to ensure to meet one's train by compensating for the difference between local time and railway time. Furthermore, provincials who travelled by rail were perplexed by the standard time and regular service railway brought with them.³⁷ Throughout his novels, Hardy describes Wessex as a place enclosed by railways and yet still largely unaffected by the way of life that accompanied them. Hardy's characters tend to be uninterested in the railways that encircle their habitat, and appear to be unaccustomed to the strict mores of punctuality which pervaded the metropole. By removing Wessex from the implications of rail travel and telegraphs,

³⁶ Birgit Plietzsch, *The Novels of Thomas Hardy as a Product of Nineteenth-Century Social, Economic, and Cultural Change* (Berlin: Tenea, 2005), 1, 64.

³⁷ Thrift, "The Diffusion of Greenwich Mean Time," 8.

Hardy created a world that had not been dominated by timetables, pocket watches, and standard time. For him the relationship was clear: the development of railways was accompanied by a time-sense against which his characters stood.

Railways had yet to reorient the time-sense of Wessex, but they were present and visible to its inhabitants. In a retrospect, Hardy described it as “a modern Wessex of railways, the penny post, mowing and reaping machines, union workhouses, lucifer matches, labourers who could read and write, and National school children.”³⁸ While he characterized Wessex as modern in a chronological sense, the setting of his novels was intended to contrast with the modernity of contemporary cities. For example, Weatherbury, the central setting of *Far from the Madding Crowd*, had hardly experienced the changes of the urban centers.

This picture of to-day in its frame of four hundred years ago did not produce that marked contrast between ancient and modern which is implied by the contrast of date. In comparison with cities, Weatherbury was immutable. The citizen's *Then* is the rustic's *Now*.³⁹

This contrast between the rural and urban temporalities was emphasized by the discord in the encounters of the two realms. Hardy's use of the railway was directed at distinguishing Wessex from the “modern” world which trains and telegraphs represented. The pace of life in Wessex had not accelerate to that of the city where railways were a part of daily life.

The difference was clear to Sue in *Jude the Obscure* (1895), who felt that the centre of modern life in the city was the railway station.⁴⁰ In contrast to its significance in the city, the railway was of little importance in rural Wessex and gauged the pace of life

³⁸ Hardy, *Far from the Madding Crowd*, 5.

³⁹ *Ibid.*, 114.

⁴⁰ Thomas Hardy, *Jude the Obscure*, ed. Cedric Watts (Peterborough: Broadview Literary Texts, 1999), 168.

no more accurately than the sun, moon or stars.⁴¹ While railways were present in Wessex, they were nonetheless alien to its rustic inhabitants. For Hardy this was expressed “in the way a reaper looks up at a passing train—as something foreign to his element, and but dimly understood.”⁴² Although his Wessex was a modern one where railways were encountered, many of its inhabitants had little concern for, or acquaintance, with the comings and goings of these machines.

This concept of the railway as something foreign is a recurring theme within the Wessex novels. In *Tess of the D'Urbervilles* (1891) Hardy described the meeting of two worlds, one industrial and urban, the other agrarian and rural. Delivering a can of milk to a train station, Tess, a milkmaid, stood in stark contrast to the hissing arrival of a train. Hardy emphasized this by writing that “[n]o object could have looked more foreign to the gleaming cranks and wheels [of the engine] than this unsophisticated girl.”⁴³ Furthermore, “the few minutes of contact with the whirl of material progress lingered in her thought” and Tess enquired after the destination of the milk she had delivered.⁴⁴ She speculated that it would be sent to London and there “strange people [she] had never seen... who had never seen a cow,” and who knew nothing of her or how the milk would make its way to them.⁴⁵ It was the railway that marked the boundary between the Tess and those strangers. Although railways had encircled Wessex and run along its borders, they had never penetrated the interior.⁴⁶

⁴¹ Thomas Hardy, *Tess of the D'Urbervilles*, 5th ed. (New York, Nelson Doubleday, Inc., 1912), 172.

⁴² Hardy, *Far from the Madding Crowd*, 93.

⁴³ Hardy, *Tess*, 172-173.

⁴⁴ *Ibid.*, 173.

⁴⁵ *Ibid.*, *Tess*, 173.

⁴⁶ *Ibid.*, 93.

[...] by day, a fitful white streak of steam at intervals upon the dark-green background denoted intermittent moments of contact between their secluded world and modern life. Modern life stretched out its steam feeler to this point three or four times a day, touched the native existences, and quickly withdrew its feeler again, as if what it touched had been uncongenial.⁴⁷

Even two towns less than twenty miles from one another resisted “the amalgamating effects of a roundabout railway,” and retained a distinct feeling of remoteness so that Tess still felt them to be quite distant from each other.⁴⁸ Wessex inhabitants had yet to overcome the experience of distance characteristic of pre-railway modes of transport.⁴⁹ Hardy wrote in *The Mayor of Casterbridge* (1886) that one of the main urban areas of Wessex had yet to be enveloped by the railway. While it “had stretched out an arm towards Casterbridge at this time, but had not reached it by several miles as yet.”⁵⁰ The railway had intersected the communities of Wessex yet it had little impact on either the pace of life or the distinctness of these communities.

The failure of the railway to merge the cultures of neighbouring Wessex towns was exhibited in the temporal irregularity of Egdon in *The Return of the Native* (1878). Hardy described a meeting between the inhabitants of several villages where the difference in time kept varied as much as thirty minutes, “each came with his own tenets on early and late.”⁵¹ In Egdon itself, people kept different time standards derived from local customs and traditions.

⁴⁷ *Ibid.*, 172.

⁴⁸ *Ibid.*, 68.

⁴⁹ Plietzsch, 62.

⁵⁰ Thomas Hardy, *The Mayor of Casterbridge: The Life and Death of a Man of Character* (London: MacMillan and Co., 1902), 319.

⁵¹ Thomas Hardy, *The Return of the Native* (Toronto: MacMillan Company of Canada, 1911), 157.

[...] there was no absolute hour of the day. The time at any moment was a number of varying doctrines professed by the different hamlets, some of them having originally grown up from a common root, and then become divided by secession, some having been alien from the beginning.⁵²

Wessex was insulated from the temporal regularity and homogenization underway in larger cities. Rather than making attempts to standardize clock times, these rustics were prepared to wait the half hour that distinguished their clocks from their neighbors. Hardy described a great disjunct between the ringing of clocks in Casterbridge. The lack of coordination between various public and private clocks in the city was so extreme “that chronologists of the advanced school were appreciably on their way to the next hour before the whole business of the old ones was satisfactorily wound up.”⁵³ The impediments to rustic’s time-discipline also appeared in *Punch*. Railway porters were regularly instigators of mischief which travellers comically dealt with. Even porters at country stations did not appreciate time as a passenger did (Figure 3.1). The inhabitants of Wessex had a different appreciation for the passage of time and the value of timekeeping devices. Hardy juxtaposed the railway with the countryside it had been as yet unable to change, emphasizing the lack of time-awareness that would have accompanied the railway’s integration into the movements of Wessex.

One of the ways Hardy depicted Wessex as a region whose inhabitants were generally uninfluenced by the heightened concerns of punctuality and time-awareness accompanied by the railway was his portrayal of clocks and watches. The timekeeping devices which appear in the Wessex novels are frequently erratic, though this does not seem to impinge on the ways of rural life.

⁵² *Ibid.*, 157.

⁵³ Hardy, *The Mayor of Casterbridge*, 33-34.



Impatient Traveller. "ER—HOW LONG WILL THE NEXT TRAIN BE, PORTAH?"
Porter. "HEAW LONG? WEEL, SIR, AH DUNNO HEAW AH CON SAAY TO HAUF AN INCH. HAPPEN THERE 'LL BE FOWER OR FIVE OO-ACHES AN' A ENGINE OR SOA."

Figure 3.1 - IMPATIENT TRAVELLER AND RAILWAY PORTER.⁵⁴

Gabriel Oak, the protagonist in *Far from the Madding Crowd*, is a vivid example of what Hardy may have felt to be the relatively un-timed orientation of rural life. Oak owned what served the purpose of a watch, yet Hardy characterized it as an outdated device. He explained that "it was a watch as to shape and intention, and a small clock as to size."⁵⁵ Furthermore the device was anything but reliable,

Being several years older than Oak's grandfather, [the watch] had the peculiarity of going either too fast or not at all. The smaller of its hands, too, occasionally slipped round on the pivot, and thus, though the minutes were told with precision, nobody could be quite certain of the hour they belonged to.⁵⁶

⁵⁴ "Impatient Traveller and Railway Porter," *Punch* 110, April 18, 1896, 192. In the country, even railway porters did not speak the same temporal language as passengers.

⁵⁵ Hardy, *Far from the Madding Crowd*, 7.

⁵⁶ *Ibid.*, 7-8.

Oak's erroneous watch might have been a cause for concern in the hands of a railway passenger, but he made do. Relying on the position of the sun, stars, and other clocks he had the opportunity to observe, Oak was able to keep the device in check and himself on time.

Oak's proficiency in discerning the time through the stars and sun appears several times in the novel, suggesting that while church clocks were heard to strike the hour, they were not employed to keep one's watch on time. Finding that the hour-hand of his watch had slipped while caring for a new-born lamb, he looked to the stars to determine the time. Having decided by the position of the constellations that it was one o'clock, "he stood still after looking at the sky as a useful instrument, and regarded it in an appreciative spirit."⁵⁷ Oak, however was not the only character to rely on nature as a timepiece. For want of a watch, another figure was able to determine the passage of time within a half hour of accuracy according to the movement of the sun.⁵⁸ Yet Oak's facility for making temporal observations was not merely a useful or common skill. It earned him the respect of other Wessex labourers. Upon obtaining employment as a shepherd in the town of Weatherbury, he was deemed "to be such a clever man," for his ability to make sun-dials and "tell the time as well by the stars."⁵⁹

Gabriel Oak is far from Hardy's sole example of Wessex's peculiar time orientation. Hardy famously described Wessex as "not made for hasty progress" and where "one-handed clocks sufficiently subdivided the day."⁶⁰ As with Oak, Hardy affirmed that clock accuracy was not an important issue in Wessex. Rough estimates

⁵⁷ *Ibid.*, 15.

⁵⁸ Hardy, *The Mayor of Casterbridge*, 403.

⁵⁹ Hardy, *Far from the Madding Crowd*, 87.

⁶⁰ Hardy, *Tess*, 18.

proved sufficient and when other time standards were encountered, individuals made compromises and waited.⁶¹ Nor was Oak the only farm-labourer whose watch was irregularly large. The dairyman in *Tess* is also identified as having a heavy watch that tells him the time has passed by faster than he perceived. This realization creates a sense of urgency in him as the delivery of his milk to the railway station must now be rushed.⁶² Where and when they were needed, bulky and erroneous clocks and watches served the purposes of Wessex. Moreover, where clock time had become an issue and conflicted with the internal experience of time, railway were involved.

The devices Hardy incorporated into the time-reckoning of his characters also reflect the attitudes they had towards the passage of time. While the sun and stars were natural sources of time that could be relied upon, Tess reflected on the bird that awakes while the rest of the world is still quiet, and “sings with a clear-voiced conviction that he at least knows the correct time of day, the rest preserving silence as if equally convinced that he is mistaken.”⁶³ In Wessex nature was a source of time as much as timetables, watches, and public clocks. Akin to the use of sun-dials and astronomical aids, another inhabitant of Wessex carried an hour-glass with her in addition to a watch.⁶⁴ However, rather than using the hour glass to mark out portions of the day, Eustacia kept it with her “because of a peculiar pleasure she derived from watching a material representation of time's gradual glide away.”⁶⁵ Time in Wessex had an entirely different meaning than it did in large cities that lay beyond its borders marked out by iron rails and puffs of steam.

⁶¹ Hardy, *Return of the Native*, 157.

⁶² Hardy, *Tess*, 170.

⁶³ *Ibid.*, 41.

⁶⁴ Hardy, *Return of the Native*, 65.

⁶⁵ *Ibid.*, 84.

Inhabitants of this secluded world appeared at times to have what Hardy called “an Oriental indifference to the flight of time.”⁶⁶ The sense of past, present, future had a meaning foreign to the industrialized parts of the country.

In London, twenty or thirty years ago are old times; in Paris ten years, or five, in Weatherbury three or four score years were included in the mere present... In these Wessex nooks the busy outsider’s ancient times are only old; his old times are still new; his present is futurity.⁶⁷

Hardy’s semi-fictional Wessex reveals how time-awareness, according to contemporaries, was germane to industrialization and more specifically to the railway. The issues of punctuality and clock accuracy were metropolitan ones because of the railway’s impact on the pace of life. A more acute awareness of time was just as foreign to Hardy’s rural world as the steam engine. Watches and clocks could exist alongside sundials and the constellations as indicators of time in Wessex. In the metropole, however, railways and city life enforced a time discipline that demanded a higher degree of accuracy and regulation.

Through constructing Wessex, Hardy reflected contemporary beliefs that industrial technologies and time-discipline were connected but that a sustained relationship needed to exist for railways and telegraphs to affect one’s time-awareness. Wessex dwellers were neither avid rail passengers nor commonly sending and receiving telegrams. As such, they neither experienced nor exclaimed the death of time as avid users of these technologies would have. However, residents of the metropole, concerned themselves with clock accuracy, timetables, and for Wells, the means of travelling through time with as much ease as the railway did through space.

⁶⁶ Hardy, *Far from the Madding Crowd*, 109.

⁶⁷ *Ibid.*, 114.

WELLS, TRANSPORT TECHNOLOGY, AND THE CONQUEST OF SPACE AND TIME

H. G. Wells' fictional accounts of technology provide a unique insight popular representations of science and technology in the late Victorian era. He incorporated his formal education as a scientist into his writing through lucid technical details of the problems his characters encountered. Although it was relatively common for scientists to write science fiction, according to Roslynn Haynes, Wells stood apart from others for his ability to engage with a wider audience who lacked any scientific or technical training.⁶⁸ Interestingly, he stands apart from his contemporary Kipling for his own satirical stance toward the technological condition of his time.⁶⁹

Commentary on H. G. Wells' *The Time Machine: An Invention* (1895) has tended to focus on the application of evolutionary theory, the idea of degeneration, and the nineteenth century's discovery of deep time. Few have assessed Wells' priority in the use of a machine to travel through time and the discussion of time as the fourth dimension of space.⁷⁰ Years before he would even coin the term "Time Machine," Wells used the words "mechanical contrivance" to describe "the Chronic Argo, the Ship that sails through time."⁷¹ His story, *The Chronic Argonauts* (1888) was originally serialized in *The Science Schools Journal* before he abandoned it after only three issues.⁷² Despite quitting

⁶⁸ Roslynn D. Haynes, *H. G. Wells: Discoverer of the Future: The Influence of Science on his Thought* (New York: New York University Press, 1980), 221-222. Haynes cites Wells' description of the fourth dimension in *The Time Machine* as an example of this and contrasts it with C. H. Hinton's less engaging description in *Scientific Romances* (1886) and *The Fourth Dimension* (1904)

⁶⁹ *Ibid.*, 73.

⁷⁰ W.M.S. Russell, "Time Before and After *The Time Machine*," in *H.G. Wells's Perennial Time Machine*, George Slusser, Patrick Parrinder, and Daniele Chatelain eds. (Athens: The University of Georgia Press, 2001), 51; Mark Rose, *Alien Encounters: Anatomy of Science Fiction* (Cambridge: Harvard University Press, 1981), 100.

⁷¹ H. G. Wells, "The Chronic Argonauts," in *The Time Machine: An Invention' A Critical Text of the 1895 London First Edition*, Leo Stover ed. (London: McFarland and Company, Inc., 1993), 190, 192.

⁷² *The Science Schools Journal* was the student magazine for the Normal School of Science and the Royal School of Mines. Wells had attended the former prior to taking his B.Sc. examination at London University in 1890. H. G. Wells, *The Time Machine: An Invention' A Critical Text of the 1895 London First Edition*, ed. Leo Stover (London: McFarland and Company, Inc., 1993), 174.

the story before the plot had developed, the central ideas about the possibility of time travel were already present. He explained time travel through the inventor of the Chronic Argo, Dr. Moses Nebogipfel:

[...] we find ourselves no longer limited by hopeless restriction to a certain beat of time—to our own generation. Locomotion along lines of duration—chronic navigation comes within the range, first of geometrical theory, and then of practical mechanics.⁷³

While his discussion of a four-dimensional geometry is significant in its own right, I argue that in treating time as akin to space Wells used the language of industrialized technologies to express the concept of time travel. Before Wells could discuss the possibility of controlling time, he had to relate it to space where nineteenth-century science and engineering had successfully increased human powers of mobility. Ironically, however, in *The Time Machine* the traveller learns that time ultimately triumphs in spite of his attempts at control.

In 1881 John Venn (1834-1923) published a paper in the journal *Mind*, entitled “Our Control of Space and Time,” which in several respects anticipated Wells’ idea of time travel. Venn examined the limits of one’s movement and observation in space and time. He sought to determine whether the known limits of controlling space and time might be extended and approached this problem from the perspective of both an antiquarian and philosopher.⁷⁴ While noting the extensive though incomplete powers that humans had amassed in order to move about in space, procure answers to historical questions, and research matters of physical science, he realized the disparity of these powers when concerned with time. He argued that a “state of powerlessness represents

⁷³ Wells, “The Chronic Argonauts,” 193.

⁷⁴ John R. Gibbins, “Venn, John (1834-1923),” *Oxford Dictionary of National Biography*, online edition (Oxford University Press, 2006). www.oxforddnb.com.

almost exactly our relation to events in respect of time. We are bound, as we all know, to go steadily forwards: we have no power to stand still, go sideways, or backwards.”⁷⁵ Acknowledging these limitations he imagined instruments capable of controlling the passage of time and in a sense magnifying the duration of events in the same way that microscopes and telescopes magnify the size of objects.⁷⁶ Like Wells, Venn’s contemplation of mobility in time offer striking insights into contemporaries’ concerns. In contradistinction to the advances wrought by the railway and telegraph, few possibilities had been opened up in the control over time with the exception of more precise methods and apparatuses of measurement. Both Venn and Wells sought the means to bring the advances of various fields of science and technology to the control of time.

In *Tales of Space and Time* (1899) Wells wrote of the advance of technology. He described how at the beginning of the century travel was slow, and people travelled rarely, living in the country and not leaving their villages.

By the end [of the century], the invention of railways, telegraphs, steamships, and complex agricultural machinery, had changed all these things: changed them beyond all hope of return... That this was an inevitable result of improved means of travel and transport—that, given swift means of transit, these things must be—was realised by few.⁷⁷

Travel was an important theme in this text, and for Wells the railway was the beginning of a series of changes that altered the face of humanity. While technology had increased the powers of communication, transportation, and production, they were accompanied by the unavoidable move towards urban living. Wells emphasized the power of technology to shape civilization and considered the railway to be “prominent if not paramount among

⁷⁵ Venn, “Our Control of Space and Time,” *Mind* 6, no. 21 (1881), 22.

⁷⁶ *Ibid.*, 29-30.

⁷⁷ H. G. Wells, *Tales of Space and Time* (New York: Harper & Brothers Publishing, 1900), 199.

world-changing inventions in the history of man.”⁷⁸ These “contrivances in locomotion” changed how and where people lived, they also changed how they understood the space and time that they lived in.

One of the major changes Wells lays claim to is the discussion of a four-dimensional geometry in fiction. In *The Chronic Argonauts* and *The Time Machine*, Dr. Nebogipfel and the Time Traveller, respectively, discuss the possibility of such a geometry with their guests. This discussion is the basis for explaining the possibility of time travel, and also the application of technology in obtaining this end. Each asked his guest whether it was possible for an object with only length, breadth and thickness to exist. Upon receiving affirmative replies, each retorted that without duration nothing could exist.⁷⁹ Furthermore, according to the Time Traveller, “There is no difference between Time and any of the three dimensions of Space except that our consciousness moves along it.”⁸⁰ The Time Traveller is met with the objection that we cannot move about freely in time as we can in space. He replies that humans were not always able to move about in three dimensions—even in two dimensions travel was extremely limited before ocean-going sail boats, railways and steamers had been developed.⁸¹ Wells expressed this notion effectively (and somewhat poetically) in the voice of Dr. Nebogipfel.

⁷⁸ *Ibid.*, 231.

⁷⁹ Wells, “The Chronic Argonauts,” 193; H. G. Wells, *The Time Machine: An Invention*, ed. Nicholas Ruddick (Peterborough: Broadview Press Ltd., 2001), 60.

⁸⁰ Wells, *The Time Machine*, 60.

⁸¹ *Ibid.*, 62.

Speaking practically, man in those day was restricted to motion in two dimension; and even there circumambient ocean and hypoborean fear bound him in. But those times were to pass away. First the keel of Jason cut its way between the Symplegades, and then in the fulness of time, Columbus dropped anchor in a bay of Atlantis. Then man burst his bidimensional limits, and invaded the third dimension, soaring with Montgolfier into the clouds, and sinking with the diving bell into the purple treasure-caves of the waters. And now another step, and the hidden past and the unknown future are before us. We stand upon a mountain summit with the plains of the ages spread below.⁸²

From here one can see Wells' logic begin to take shape. He argues that humans have been able to extend their powers of motion in each of the three dimensions of space only through the means of technology. Given that time or duration is no different than these three other dimensions, it is possible to build a machine that can give humans the power over movement in time. The very foundations of Wells' stories were grounded in the technological triumph over space that the nineteenth century witnessed. Wells' fiction brought to life a machine capable of annihilating time in more literal sense than contemporaries could state about either the railway or telegraph.

In addition to using the advances of technology as a means of establishing the possibility of time travel, Wells employed language akin to the experience of industrialization and the railway journey. In relating the account of his first voyage on the time machine to his guests, the Time Traveller described time travel as "excessively unpleasant." He recalled the feeling of stumbling or spinning and a frightful sense as if he had been falling. He described it as "a helpless headlong motion! I felt the same horrible anticipation, too of an imminent smash."⁸³ He further recalled that "[t]he unpleasant sensations of the start were less poignant [as his journey continued]. They

⁸² Wells, "The Chronic Argonauts," 193.

⁸³ Wells, *The Time Machine*, 76, 77.

merged at last into a kind of hysterical exhilaration.”⁸⁴ He described the “clumsy swaying of the machine” and a madness and dread that grew over him until he reversed the controls and put the time machine to a halt.⁸⁵ “Like an impatient fool, I lugged over the lever, and incontinently the thing went reeling over, and I was flung headlong through the air.”⁸⁶ Having reached this future destination, the Time Traveller “was seized with a panic fear.”⁸⁷ This new travel experience overwhelmed the Time Traveller mentally and physically.

The Time Traveller’s account of his maiden chronological voyage bears strong resemblance to the early encounters with rail travel. Wells not only looked to the railway as a means of establishing the possibility of time travel, but also the sensations of mechanized travel to bring life to his fictional machine in the eyes of the reader. Looking to Wolfgang Schivelbusch’s account of the anxieties and experiences early rail travellers encountered, given in *The Railway Journey: The Industrialization of Time and Space in the 19th Century* (1977), the similarities become clear. Compared with coaches and wagons that had preceded them, railways felt “uncannily smooth” so that one had the feeling of the “train as a projectile shot through space and time.”⁸⁸ Similar to the Time Traveller’s gradual acclimatization to his own journey, the underlying anxieties that characterized early rail travel had largely disappeared by the late nineteenth century as passengers had been exposed to the railways for decades. As Schivelbusch writes, “Western Europe had culturally and psychically assimilated the railroad.”⁸⁹ However, before this time the railway presented real anxieties as both the speed of travel and the

⁸⁴ *Ibid.*, 78.

⁸⁵ *Ibid.*, 78.

⁸⁶ *Ibid.*, 79.

⁸⁷ *Ibid.*, 80.

⁸⁸ Schivelbusch, 129.

⁸⁹ *Ibid.*, 130.

possibility of an accident filled the passenger's mind. Initially the long term presence of these anxieties were associated with physical damage to the spine as a result of mechanical shocks and vibrations. However, by the 1880s the physical causes of these anxieties were being replaced by psychical ones, what had been known as railway spine, was then described as a neurosis.⁹⁰ The Time Traveller's experience and the fear of an accident imply a relation to these experiences which were being given a psychological foundation during Wells' adolescence.⁹¹

Beyond these internal sensations which accompanied time travel, Wells described the passage of time in a manner that again resembled the early perception of the passing countryside from a railway carriage. As the Time Traveller recalled the journey to his guests:

I was already going too fast to be conscious of any moving thing. The slowest snail that ever crawled dashed by too fast for me. The twinkling succession of darkness and light was excessively painful to the eye. Then, in the intermittent darkness, I saw the moon spinning swiftly through her quarters from new to full, and had a faint glimpse of the circling stars. Presently, as I went on, still gaining velocity, the palpitation of night and day merged into one continuous greyness."⁹²

This account continued and the Time Traveller began to notice season change occurring in a matter of minutes, and the great buildings being erected around him instantaneously. After a while he felt these perceptions take possession of him.⁹³ Early rail passengers

⁹⁰ *Ibid.*, 135-136. Several reports in the British Medical Journal from this period indicate that unpunctuality contributed to nervousness along with the concern over accidents. This was such a problem that railway unpunctuality was considered "a national tyranny." Railway Unpunctuality and Public Health," *The British Medical Journal* 2, no. 1189 (1883): 734; "Trains, Worry, and Disease," *The British Medical Journal* 2, no. 2021 (1899): 795-796.

⁹¹ Interestingly, Wells included a psychologist as one of the Time Traveller's guests in the 1895 edition of his story. The psychologist aids the Time Traveller in explaining to the other guests why the model time machine he had set in motion would not have been visible, as it was travelling so quickly through time that its presentation was below the threshold. Wells, *The Time Machine*, 67.

⁹² Wells, *The Time Machine*, 77.

⁹³ *Ibid.*, 78.

experienced similar strain on their senses as a result of the new speed with which they view the passing scenery.

Sitting in a railway carriage, passengers had little opportunity to view the objects that lay closer to the railway tracks until they were passing them by. Robert Louis Stevenson captured this same experience in his poem “From a Railway Carriage:”

Faster than fairies faster than witches,
Bridges and houses, hedges and ditches;
And charging along like troops in a battle,
All through the meadow the horses and cattle:
All of the sights of the hill and the plain
Fly as thick as the driving rain;
And ever again, in the wink of an eye,
Painted stations whistle by.⁹⁴

Stevenson’s assessment of the railway journey presents the reader with a sense of the speed with which these perceptions pass by the viewer. The first stanza is packed with an array of perceptions and the pace of the verse give a mechanical monotony to their passage. His poetic license captures the feeling accompanying these passing visions, and the sense of exhaustion in processing such varied perceptions. The speed of travel caused the images to pass so rapidly that, according to Schivelbusch, one seemed to lose control of the senses; “visual perception [was] diminished by velocity.”⁹⁵ Furthermore, contemporaries complained of the stress that the speed caused by increasing the visual stimulants and ripping them away from the field of vision so quickly.⁹⁶

While Wells’ Time Traveller succeeds in constructing his vehicle on the principles of a new four-dimensional geometry, and the technological advances of humans over space, he ultimately comes to find a grim fate for the Earth and humanity. Traveling to

⁹⁴ Robert Louis Stevenson, “From a Railway Carriage,” in *A Child’s Garden of Verses* (London: Longmans, Green, and Co., 1885), 45.

⁹⁵ Schivelbusch, 54-55.

⁹⁶ *Ibid.*, 57.

the year 802,701, when homo sapiens had divided into two species, the Eloi and the Morlocks as he termed them, the traces of their humanity had been erased. He assumes the Morlocks to be the workers that were pushed underground, and the Eloi to be the elites whom they raised like livestock for their consumption. In spite of the technological achievements of humanity, the Time Traveller discovers this fate that time nonetheless has in store. As Mark Rose has commented, the time machine reveals that humanity is subject to time's own machinations which cannot be escaped.⁹⁷ Wells' story thus illustrates the complications that accompany technology. It was the failure of technology to control the fourth dimension that the time machine revealed. Time reigned supreme, and technology would serve to undermine humanity.⁹⁸ Although intended to extend the powers of mobility the time machine, much like the railway and the telegraph, brought its users into contact with new time-disciplines. Whereas railways and telegraphs increased the pace of life for users and necessitated a heightened sense of clock time and systems of clock regulation, the time machine increased the pace, or passage, of time. However, in the eyes of passengers and the Time Traveller, the control which was assumed to exist in these systems did not, and only through attention to the passage of time—in the case of the Time Traveller, to the time that had passed—could these users understand the failure of technology.

⁹⁷ Rose, 101.

⁹⁸ Paul Fayer, "Strange New Worlds of Space and Time: Late Victorian Science and Science Fiction," in *Victorian Science in Context*, ed. Bernard Lightman (Chicago: The University of Chicago Press, 1997), 262; Patrick Parrinder, *Shadows of the Future: H. G. Wells, Science Fiction, and Prophecy* (Syracuse: Syracuse University Press, 1995), 49-51.

CONCLUSIONS

This chapter has examined the relationship between time and technology as it was manifested in fictional texts during the late nineteenth century. In the texts discussed, technology acted as a literary device either creating dramatic complications for the protagonists or, as in the case of Hardy and Wells, creating a setting in which characters explored other problems. The juxtaposition of technology and issues of time and timing in these fictions reveal a great deal about late nineteenth-century encounters with technological systems. Machines and technological systems were bound to the idea of progress; so too was the use of clock time.

Kipling, Howarth, Hardy, and Wells each elucidate the relationship between interactions with technological systems and the time-consciousness of the late nineteenth century. While the telegraph and railway became accessible to a significantly larger portion of the population in the late nineteenth century, users would have been the main recipients and movers behind the new time disciplines epitomized by GMT and synchronized clocks. Howarth's story reveals a truism which users of the telegraph quickly understood: rules had to be observed to avoid miscommunication. "The Telegram" demonstrated the complications which users could face when they tried to take advantage of the telegraph. According to James Mussell, Howarth's story illustrates the new temporal configuration created by late nineteenth-century socialization of information technology."⁹⁹ Being the first with the news meant employing telegraphs to step out of traditions time-space while leaving other locked within. Though Howarth's

⁹⁹ Mussell, 204.

story was fictional, it stands apart from the other pieces I have considered for the realism of its literary form.

Along the same lines, Kipling's story demonstrates how social norms were influenced by transport technology. For Kipling, the railway and punctuality were used to define a cultural difference between two nations, emphasizing the value of public timing in Britain, and a possible ego-centrism in America (for which he was criticized). This supports the notion that technologies themselves did not create or impose cultural values about their use, but presented a setting in which users could develop their own mores.

Hardy's *Wessex* also demonstrates contemporaries' awareness that time-disciplines did not depend on the technologies themselves. Whether and how users appropriated technologies in their daily life was a determining factor in establishing time-disciplines. However, he also shows that without continued use of technology the kind of time-awareness which existed in metropolitan areas could not develop in rural Britain. There it was possible to interact with technologies and retain independence from a temporality which appeared to flow naturally from it in the metropole. Casual or infrequent encounters with the railway and telegraph did not demand a reorientation of one's time-discipline. Rather, in *Wessex* people lived on, employing clocks but to a lesser degree than in the metropole. Social time followed different rhythms based in agriculture. Railways stood at the boundary of *Wessex* not only geographically, but temporally also.

Finally, Wells' bridging of the technical conquest over space and the desire to bring time under control depict a preoccupation with the powers technology afforded its

users. For Wells, the railway journey and the material progress of the nineteenth century were the background upon which he fantasized about the possibility of actually annihilating time. Although Wells used the time machine to bring his protagonist to a new setting far in the future, where he developed other themes concerning natural selection and socialism, the role of technologies in creating this future should not be ignored. He reminds the reader that unfortunately locomotion in space or time does not amount to control of space or time.

CHAPTER FOUR: CONSTITUTING TIME - TECHNOLOGY AND PHILOSOPHICAL ATTITUDES TOWARDS TIME

There are Clocks of all sort and all sizes we know,
And some are too fast, and some are too slow,
And some go too quickly, and others *won't* go...
And to “synchronise” *them* is a task far too tall...
And you'll find that each clock *keeps a time of its own*.¹

Centuries before railways and telegraphs were annihilating time and defying the sun, philosophers like Aristotle and Saint Augustine inquired into the nature of time. However, new technological systems inspired new answers for nineteenth-century philosophers who asked questions similar to those of Augustine and Aristotle. Whereas Stephen Kern has argued that new approaches to the nature of time between 1880 and 1918 were a product of time standardization, this chapter argues that these ideas were a product of a more direct engagement with technological systems which influenced the development of new time-disciplines for users of these technologies.² Despite this disagreement, Kern's assessment of the “Culture of Time” is useful in describing earlier origins of this movement in Britain,

The introduction of World Standard Time created greater uniformity of shared public time and in so doing triggered theorizing about a multiplicity of private times that may vary from moment to moment in the individual, from one individual to another according to personality, and among different groups as a function of social organization.³

This chapter takes up Kern's assessment and argues that although attempts at standardization played a significant role in generating new philosophical interpretations of time, World Standard Time did not initiate this movement. Rather, technological encounters with railways and telegraphs as systems which made the standardization of

¹ “Look at the Clock,” *Punch* 84, May 12, 1883, 222.

² See chapter two.

³ Kern, 33.

time relevant already occasioned the philosophical redefinition of time before World Standard Time and systems capable of implementing it were a reality.

Whereas the International Meridian Conference gathered “representatives from twenty-five civilised nations” in Washington to vote on the location of the world Prime Meridian in 1884, Greenwich—the chosen meridian—had been the basis for railway time in Britain since 1848.⁴ Kern argues standardization in European countries during the 1880s and 1890s prompted a philosophical response emphasizing subjective time. I argue that by 1870 this response was already materializing in Britain. Earlier *attempts* to implement GMT as railway time, and the heightening of passengers’ use and awareness of clock time—as discussed in Chapters Two and Three—triggered speculation about private time prior to the conception and introduction of World Standard Time. Furthermore, growing concerns over punctuality allowed passengers to become more attentive to the clock times they encountered and made clock error and waiting more noticeable and problematic.

This chapter argues that these practical issues had already presented nineteenth-century British philosophers with new ideas about subjective time before individuals like William James, Henri Bergson, and Edmund Husserl were taking up the question of time. Kern refers to these figures as representatives of a cultural movement taking place around the turn of the twentieth century which “affirm[ed] the reality of private time against that of a single public time and define[d] its nature as heterogenous, fluid, and reversible.”⁵ However, British philosophers like Charles Lutwidge Dodgson (1832-1898), Bernard Bosanquet (1848-1923), and Shadworth Hollway Hodgson (1832-1912) were on the

⁴ “Prime Meridian Time,” *Nature* 33 (1886), 262.

⁵ Kern, 34.

forefront in developing these ideas. This chapter argues that the new travel experiences arising from the railway were not only useful tools in dealing with philosophical problems about time, but actually presented these problems to passengers. As discussed in Chapters Two and Three, railways, telegraphs, and clock time, influenced notions of punctuality and increased users' exposure to a variety of possible time measures. For philosophers, the emphasis on public time measures in daily life precipitated a new focus on the private experience of time.

HODGSON AND DODGSON - PHILOSOPHERS OF TIME

Charles Dodgson proves to be one notable precursor to the international culture of time that took place around the turn of the century. A logician and mathematician, Dodgson incorporated time into several of his novellas written between the 1860s and 1890s under the pseudonym Lewis Carroll. As Carroll he employed time in a number of ways, acknowledging contemporary mores about punctuality and exploring strange new temporalities. In *Through the Looking Glass* (1872) he confronted clock time explicitly. In this sequel to *Alice's Adventures in Wonderland* (1865), Alice encounters reversed temporalities possible only in private experience. As Alice passed through the looking glass she turned and noticed a sign of the temporal confusion which awaited her: "the very clock on the chimney-piece had got the face of a little old man, and grinned at her."⁶ Writing for a popular audience he introduced the reversed flow of time in a child's dream-world as a distinction between public and private time.

⁶ Lewis Carroll, "Through the Looking Glass," in *The Philosopher's Alice*, ed. Peter Heath (New York: St. Martin's Press, 1974), 133. This anthropomorphic portrayal was common in illustrations of time pieces and may have been a commentary on clocks' agency in regulating daily life. "Our Railway Stations," *Moonshine*, April 18, 1891, 190; "The Old Clock on the Stare," *Punch* 62, February 3, 1872, 44.

Alice soon encountered the White Queen and became acquainted with the irregular timing of the world she had entered. The Queen quickly offered Alice employment as a lady's maid. Part of the payment for this job was "jam every other day... The rule is, jam to-morrow and jam yesterday—but never jam to-day."⁷ Noticing Alice's confusion, the Queen continues to state "That's the effect of living backwards, it always makes one a little giddy at first—but there's one great advantage in it, that one's memory works both ways."⁸ Although Carroll does not explain the seemingly odd comments made by the characters Alice encounters, they point to a private experience of time in which memory played a determining role.⁹

The Queen continued to tell Alice how events happened in reverse order in the looking glass world. Jail sentences were followed by trials and then by the commission of the crime. Just as Alice began to question the Queen about this reversal, she began to cry "so exactly like the whistle of a steam engine, that Alice had to hold her hands over her ears."¹⁰ The Queen was about to have her hand pricked and began to scream in pain before she was wounded as customary when one lives backwards. Similar to an event where Alice must distribute a cake and then slice it, the Queen's anticipation of the cut by feeling pain and screaming shows a reversal in the progression of events.¹¹ More importantly, Alice's inability to understand the order of succession demonstrates the problems of reconciling private and public time. The Queen, whose screams resembled

⁷ Carroll, "Through the Looking Glass," 176.

⁸ *Ibid.*, 177.

⁹ Given that public and private time have been reversed in the looking glass world, so that public time flows from past to present, the Queen's dual-memory may point to similar theories about the constitution of time developed by Shadworth Hodgson. Hodgson and the phenomenologists who would develop this further around the turn of the century argued that time consciousness is constituted by protentions and retention. Hodgson argued in *Time and Space* (1865) that consciousness progressed in two opposite directions. He called these prolongations forward and in the reverse. Consciousness is constituted in the synthesis of these two progressions in an extended present. Hodgson, *Time and Space* (200, 191).

¹⁰ Carroll, "Through the Looking Glass," 178.

¹¹ *Ibid.*, 208.

the whistles of steam engines, presented the possibility of different temporalities to Alice. She guided Alice in a world where private, subjective time could be experienced objectively, or shared. Railways had been presenting the possibility of encountering a variety of clock times to passengers and for some of these passengers, the railway marked a division between private and public time.¹² A heightened attention to clock time revealed the subjective experience of time passed at stations or in a railway carriage as incongruous with objective measures. For passengers, waiting at stations for trains to arrive exposed a deeper feeling which constituted the very experience of time. Given these parallels, Carroll's chance description of Alice's guide as a steam engine is quite fitting.

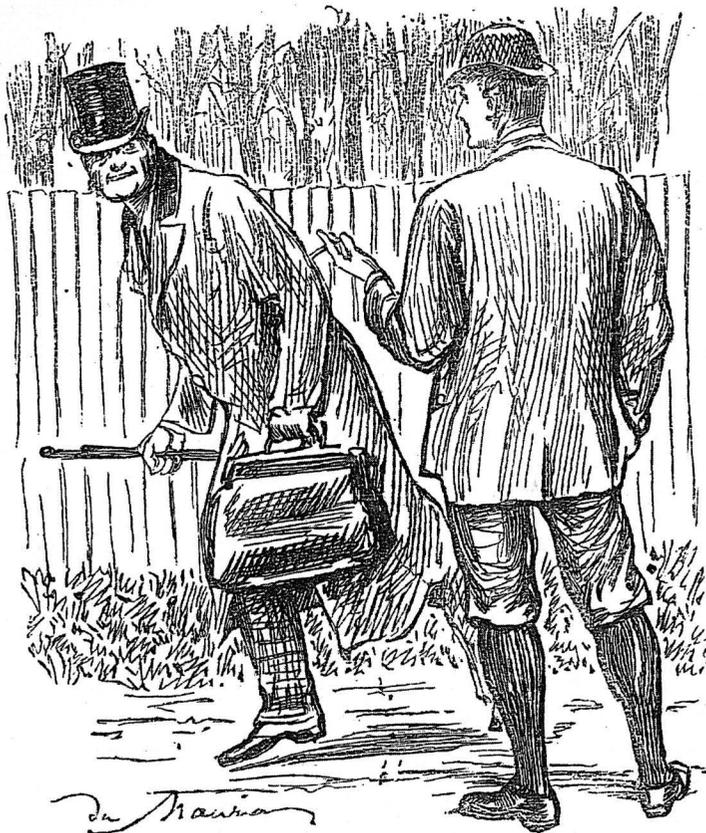
Carroll's juxtaposition of steam engines and temporal confusion was more than a mere coincidence. Contemporaries discussed the annihilation of space by time and the confusion of extracting information from timetables. Carroll himself was an experienced railway passenger or at least understood the difficulties passengers faced while passing time on a long journey. According to Morton Cohen, Carroll is credited with inventing a chess board which included holes in it to keep the pieces secured so it could be used when travelling.¹³ He also included a passing reference to *Bradshaw's Railway Guide* in his nonsensical poem *Phantasmagoria* (1869).¹⁴

As discussed in Chapter Two, punctuality became the watchword of passengers. In 1878 *Punch* yet again satirized the lives of commuters who were commonly rushing to meet trains as railway timetables dictated when and where they were supposed to be.

¹² Bernard Bosanquet and George Romanes discussed this experience explicitly in two papers discussed in the final division of this chapter.

¹³ Morton N. Cohen, "Dodgson, Charles Lutwidge [Lewis Carroll] (1832–1898)," *Oxford Dictionary of National Biography*, online edition (Oxford University Press, 2004). www.oxforddnb.com.

¹⁴ Charles Lutwidge Dodgson, "Phantasmagoria," in *The Collected Verse of Lewis Carroll*, (London: MacMillan and Co., 1932), 128.



LAST FROM THE STOCK EXCHANGE.

“HULLOA, CHARLIE! WHAT’S THE MATTER? TRAINING FOR A RACE?”
“No, TOM. RACING FOR A TRAIN!”

Figure 4.1 - RACING FOR A TRAIN.¹⁵

The theme of punctuality appeared again in *Alice’s Adventures in Wonderland* (1865). Always in a rush and behind time, the White Rabbit Alice encountered in Wonderland is akin to Carroll’s contemporaries rushing to catch a train or delayed by an unpunctual one. Alice overheard the rabbit say “Oh dear! Oh dear! I shall be too late!” as it “took a watch out of its waistcoat-pocket, and looked at it, and then hurried on.”¹⁶ Including these thoughts on punctuality relates his discussion of reversed timescales to the practical concerns of his contemporaries. Such concerns were also reflected in an earlier poem entitled “Punctuality,” originally published in his *Useful and Instructive Poetry* (1854). In

¹⁵ “Racing for a Train,” *Punch* 75, November 30, 1878, 241.

¹⁶ Lewis Carroll, “Alice’s Adventures in Wonderland,” in *The Philosopher’s Alice*, edited by Peter Heath (New York: St. Martin’s Press, 1974), 14.

it, Carroll spelled out the issue of timing in everyday life. The poem moralized the use of time and urged readers to avoid procrastination at all costs.

Better to be before your time,
Than e'er to be behind;
To ope the door while strikes the chime,
*That shows a punctual mind.*¹⁷

These examples from Carroll's writing demonstrate a continued engagement with the issues which became commonplace to railway travellers throughout the nineteenth century.

Dodgson's study of time was not limited to his writing as Carroll. His works on logic also incorporated temporality in them. Peter Øhrstrøm has argued that Dodgson was undoubtedly one of the first philosophers to reintroduce time into the study of logic since the works of medieval scholars and ancient Greeks. Basing this claim on Alice's encounter with the White Queen in *Through the Looking Glass*, Øhrstrøm calls for a sweeping review of Dodgson's works on logic, and yet does not undertake such a survey to support his claim. Rather, Øhrstrøm suggests that Dodgson's philosophical impact on his contemporaries was negligible despite the original problems he included in his popular works.¹⁸ Dodgson did in fact include time in his logic, although in a sense presumably not intended by Øhrstrøm.

Several of his logic puzzles, written for a popular audience, incorporate the issues of timekeeping into them. This appears to have been a continuing interest of Dodgson's, as he published logic games concerned with time throughout his life. One puzzle entitled "Difficulties Number 2" was published in the *Rectory Umbrella* circa 1850 and asked

¹⁷ Charles Lutwidge Dodgson, "Punctuality," in *The Collected Verse of Lewis Carroll*, (London: MacMillan and Co., 1932), 4.

¹⁸ Peter Øhrstrøm and Per F. V. Hasle, *Temporal Logic: From Ancient Ideas to Artificial Intelligence* (Norwell: Kluwer Academic Publishers, 1995), 118-119.

readers: “Which is best, a clock that is right only once a year, or a clock that is right twice every day?”¹⁹ Dodgson’s 1893 collection of logic games included one which he first conceived in 1889. This puzzle asked readers to coordinate the time on a clock which loses time from a watch which was set to GMT.²⁰ This problem shows an engagement with the practical issues of timekeeping. In one short logic game he employed three time pieces, one which loses time and two others which are used to reset it. These puzzles illustrate a connection between the fictional, subjective time scales Alice encountered and the objective time of clocks. Although public time measures never explicitly appear in his work as a primer for explaining the private experience of time, Dodgson’s work does unite the two. He demonstrates a continued engagement with the problems of timekeeping, which may have led to his considering the alternative, the internal feeling of duration.

Considered alongside his contemporaries, Dodgson represents more than a simple precursor to the movement Kern described as bracketing the turn of the twentieth century. Rather, he illustrates that this movement originated in Britain, where railways and telegraphs were instigating a popular interest in uniform time by the 1860s. One of Dodgson’s contemporaries who examined both the objective measurement of time and the subjective experience of time also had a significant influence on the movement which he and Dodgson preceded. Born in the same year as Dodgson, Shadworth Hollway Hodgson developed his philosophical interpretation of the experience of time much more

¹⁹ Lewis Carroll, *Lewis Carroll’s Games and Puzzles*, ed. Edward Wakeling (New York: Dover Publications Inc., 1992), 23, 68. Answer: “The Clock that is right only once a year is the better one; the other has stopped.”

²⁰ Charles Lutwidge Dodgson, *The Mathematical Recreations of Lewis Carroll: Pillow Problems and A Tangled Tale* (New York: Dover Publications, Inc, 1958), 7-8. This problem was originally published in volume two of Dodgson’s *Curiosa Mathematica* in 1893.

explicitly. He also had a greater impact on his contemporaries despite being almost completely forgotten after his death.

Holly K. Andersen and Rick Grush have argued that both William James' *Principles of Psychology* and Edmund Husserl's *On the Phenomenology of the Consciousness of Internal Time* were heavily influenced by the work of Shadworth Hodgson. They argue that he is the "unsung hero" of the developments in time-consciousness now associated by scholars such as Kern with James and Husserl.²¹ Though neither work have explicit credit to Hodgson, he had developed many of the attitudes towards time presented in both of these texts in a number of works he published between *Time and Space* (1865) and *The Metaphysic of Experience* (1898). Building upon the British idealist tradition, he questioned the view of time as composed of discrete moments, and instead viewed time as the feeling of succession or duration derived from the synthesis of perceptions.²² Much of Hodgson's career had been concerned with time and temporality and yet he does not seem to have made the overt comparisons to industrial technologies which several of his contemporaries did. Rather, his analysis of time-consciousness was much more abstract.

Despite the lack of any striking technological metaphor, Hodgson's theories of time still point to origins in encounters with technological systems. The railway journey as described by Schivelbusch appears to have influenced Hodgson's perception of time. By the 1860s, when Hodgson had begun his research into time and the train of consciousness, the railway was no longer a novel technology and the traveller of the late nineteenth century differed from her predecessor in that the railway journey was no

²¹ Holly K. Andersen and Rick Grush, "A Brief History of Time-Consciousness: Historical Precursors to James and Husserl," *Journal for the History of Philosophy* 47, no. 2 (2009), 277, 307.

²² Hodgson, *The Metaphysic of Experience*, 136.

longer the “space-time adventure that engaged [the] entire sensorium.”²³ Travellers had acclimatized to the railway journey and developed what Schivelbusch described as the panoramic perception. Schivelbusch discussed the new modes of spatial perception which accompanied the railway. Hodgson’s philosophy, however, is indicative of a new temporal perception.

In *The Railway Journey*, Schivelbusch argues that the new mode of transportation influenced the perception of time in a number of ways. Passengers complained about the taxing of the senses in the early days of the railway, but this eventually gave way to a new form of perceiving the journey. Rather than taking in the passing of the foreground, a new panoramic perception developed which integrated the speed of travel into the experience of the landscape so that, “only under such conditions was it possible to fully appreciate that landscape.”²⁴ Passengers restructured their attention to encompass the total scenery, blending the foreground into the background which became the focus. By the mid-nineteenth century industrialized travel had seemed to influence a similar restructuring of the time-consciousness. Initially, the railway had undermined and shocked a traditional space-time awareness by flooding the senses at an unthought of rate. However, as travellers became accustomed to the new modes of transport and the ensuing perceptual experience, they began to accept the disintegration of traditional time-space relations.²⁵

According to Schivelbusch, the railway journey entailed an entirely new experience for the traveller. The speed with which images passed by the traveller caused them to blur and the landscape itself seems to have receded from perception. This also

²³ Schivelbusch, 165.

²⁴ *Ibid.*, 59.

²⁵ *Ibid.*, 117-118, 159-160.

influenced a feeling of loss of control over the senses as the powers of perception were diminished to only being able to recognize the broad outlines on the horizon. Hodgson described the train of consciousness as a confused array of sensations upon which order is imposed: “[t]he train does not come broken up into separate minima... [it] comes to us in masses.”²⁶ The mechanization of perception, collided with the old modes of experience of the coach. The sounds and scent of the land traversed disappeared. The shock of initial encounters with the railway landscape called for the adjustment of one’s perception so as to avoid fatigue. Passengers had to distance the objects of perception from themselves as far as possible. The only means available for the traveller was to ignore the foreground and attend to the distant objects which seemed to pass less rapidly.²⁷

Hodgson’s analysis of perception in the *Philosophy of Reflection* (1878) exhibits a number of parallels to what Schivelbusch saw as the development of a new form of perception arising from the railway journey. According to Schivelbusch, encounters with the railway conditioned the development of an industrialized consciousness which interiorized the external.²⁸ Similarly, Hodgson held that perception was not received ready-made with divisions, but divisions were created through an act of attention.²⁹ He conceived of consciousness as a stream or train of events only divisible in thought and rejected the notion that consciousness was a succession of discrete events separated by infinitesimal instants. He believed that the notion of such a duration-less present was an abstraction performed by reflecting on the passage of events.

²⁶ Shadworth Hollway Hodgson, *The Philosophy of Reflection* (London: Longmans, Green and Co., 1878), 291.

²⁷ Schivelbusch, 54-56.

²⁸ *Ibid.*, 166-168.

²⁹ Hodgson, *The Philosophy of Reflection*, 291.

Instead, Hodgson conceived of an empirical present, which had duration and was constituted by the co-existence of a feeling of former and latter.³⁰ This new way of defining the present was the most basic level of consciousness, or the minima, as Hodgson termed it. This smallest possible requirement for consciousness was a comparison or synthesis of two conscious states or feelings. He claimed the present was always enclosed by these two feelings. They should not be considered stand-alone elements, but parts of the whole train of consciousness, as they cannot be perceived independently of one another. Only in reflection or thought can time be divided into these elements.³¹ These feelings are not experienced in succession but co-exist simultaneously as one fades and the other appears.³² However, as one feeling grows stronger the other fades away. This limited period of simultaneity constituted the experience of succession and of the passage of time. The perception of time contained both an element of passivity and activity not unlike that which Schivelbusch understood to arise from the senses overwhelmed by the rapidly passing landscape.³³ The combination of former and latter was responsible for the time stream, the possibility of understanding change in time and location.

As already mentioned, according to Hodgson, the divisions of the train of consciousness into earlier and later time was not received but added arbitrarily. Time itself was an essential element of consciousness, the minimum of which was a moment of simultaneity and the very possibility of understanding duration. “Crudely and popularly,” he wrote, “we divide the course of time into Past, Present, and Future; but, strictly

³⁰ *Ibid.*, 252.

³¹ *Ibid.*, 270.

³² *Ibid.*, 249-50; Andersen, 293-4.

³³ Hodgson, *The Philosophy of Reflection*, 291-292.

speaking, there is no Present; it is composed of Past and Future divided by an indivisible point or instant.”³⁴ Contrary to efforts of measuring or delimiting the present moment of experience, Hodgson argued that no such quantification was possible. The so-called present, where past and future meet have only indefinite limits as perceptions blend into each other: the (empirical or specious) present could be limited to only a few seconds, or extend several minutes. Rather than being already marked out into periods like a measuring tape, as he remarked, time was divided only in reflection.³⁵ The act of reflection, or attention was the key to the perception of past, present, and future.

Hodgson argued in both *The Metaphysic of Experience* and *The Philosophy of Reflection* that attention was the defining factor in breaking up the stream of consciousness into earlier and later moments. For Hodgson, attention was expectant and thus capable of reaching beyond the present,

Attention is always prospective as well as retrospective; and the addition of a prospective character to the retrospective perception is the reflective perception of time future, in combination with, but also in contradistinction from, time past and present.³⁶

Furthermore, attention as an act of volition, divides the time stream so that duration and change are understood subjectively.³⁷ However, while individual instances of duration and change arise subjectively, time as an objective function of consciousness was not itself subjective. Indeed, Hodgson understood time itself to be timeless or not having a position in time.³⁸

³⁴ *Ibid.*, 250, 253.

³⁵ *Ibid.*, 253-254.

³⁶ Hodgson, *The Metaphysic of Experience*, 175.

³⁷ Hodgson, *Philosophy of Reflection*, 291.

³⁸ Hodgson, *The Metaphysic of Experience*, 282.

Returning to the analysis of perception offered by Schivelbusch, the parallels between Hodgson and the industrialized consciousness begin to take shape. While the initial perceptual experience resulting from the new travel speeds caused exhaustion and strain on the senses, travellers acclimatized.³⁹ This acclimatization involved developing a form of perception capable of integrating the rapidly passing landscape. It meant destroying the relation between distance and duration. Duration was no longer “an objective mathematical unit, but a subjective perception of space-time.”⁴⁰ Similarly, Hodgson wrote, “[t]he duration common to all feelings is what we know as Time, which may therefore with strict propriety be described as the duration of empirical change, or the duration of process.”⁴¹ For Hodgson time was an integral part of the very basis of consciousness. It unified the stream of perceptions and constituted the smallest portion of consciousness possible.

It is not surprising that Hodgson developed his understanding of time in the aftermath of railway travel, when a new form of perception began to assert itself. The sensitivity to the railway journey began to fade only as a mode of panoramic perception that was acclimatized to the rapid succession of figures became common. Similarly, the effect which railway travel had on the senses pointed to an experience of time divorced from the equal divisions presented by clocks which littered stations. Though seemingly banal, this distinction between clock time and the experience of time provided the impetus for a philosophical discussion during the late nineteenth century. The ability to measure time was one of the chief concerns which appeared in this conversation. Philosophers questioned the epistemological functions and foundations of the time-

³⁹ Schivelbusch, 58.

⁴⁰ *Ibid.*, 36.

⁴¹ Hodgson, *Metaphysic of Experience*, 136-137.

measures they encountered daily. As railways were making it increasingly important for passengers to attend to clocks and pocket watches, these devices entered into the philosophical redefinition of time.

TIME-MEASUREMENT

As standardized time measures became increasingly diffused in late nineteenth-century Britain, clocks themselves performed as symbols of unity, objectivity, and knowledge. For a few individuals writing about the origins of time-measurement, the possibility of marking out identical periods of time, was both a central attribute of the 'modern' world, and a foundation of scientific knowledge. They looked to the timekeeping devices which mediated not only social interactions, but observations in the study of physical phenomenon, and found the very possibility of measuring time posed a philosophical problem. How is it possible to measure equal lengths of time which do not occur simultaneously? This question was treated abstractly, yet it was the import of clock time and timekeeping devices in daily life which prompted philosophers to examine the origins of time-measurement.

For Hodgson the initial ability to measure time rested in bringing together two equal and simultaneous events. He likened this to the comparison of two objects of equal length. Without a rule or a chronometer, two objects or two events must be brought together simultaneously to determine the equality of their length.⁴² This method, however, is entirely impractical. So it became necessary to produce a time-unit which could be repeated. This, Hodgson argued, depended on the use of physical bodies, whose

⁴² Shadworth H. Hodgson, "Time-Measurement in its Bearing on Philosophy," *Proceedings of the Aristotelian Society* 2, no. 2 (1892-1893): 79.

lengths and motions were equally reproduced. According to Hodgson, the origin of time-measures in the motions of physical bodies marked the boundary between philosophy and science. The foundations of the physical sciences rested not only upon time and space measures, but upon physical bodies which time and space measures are both applied to and derived from.⁴³ He argued that this analysis of time-measurement showed how the physical sciences limited their object of study to bodies. In contrast, philosophy went beyond this and carried its work to more fundamental experiences.⁴⁴ For the physical scientist or mathematician, time-measures are abstracted from the relations of physical objects, whereas for the philosopher, time is an abstraction “from the concrete stream of consciousness, the content of which comes in the form of sensations, perceptions, memories, attentions, thoughts, images feelings and so on.”⁴⁵ Time measurement revealed the disciplinary division between the study of experience itself, and those objects which appear in experience. For philosophers, the private experience of time lay beneath the public time measures, as something more foundational. Philosophy delved deeper into experience than did the sciences, and their approach to the study of time was evidence of this.⁴⁶

Whereas Hodgson argued for the primacy of philosophical subjective time, in the same issue of the *Proceedings of the Aristotelian Society* A. G. Greenhill commented that philosophers had yet to give an adequate definition of time. During this period there existed a clear disparity between the practical measurement of time and its philosophical definition.⁴⁷ While the time standard used in daily life was established by an Act of

⁴³ Ibid., 80.

⁴⁴ Ibid., 82.

⁴⁵ Ibid., 84-85.

⁴⁶ Ibid., 91.

⁴⁷ A.G. Greenhill, “The Measurement of Space, Time, and Matter,” *Proceedings of the Aristotelian Society*, 2, no. 2 (1892-1893), 44.

Parliament, Hodgson recorded a list of five different ways of discussing time philosophically.⁴⁸ This could have been no less confusing to mathematicians like Greenhill than contradictory station clocks would have been to the railway passenger. This matter was further complicated by the increasing precision with which time was now being measured. Astronomers working at Greenwich were refining the precision of clocks and watches, whereas philosophers continued to speculate on such questions as whether time was real or unreal.⁴⁹

Although Greenhill praised the precision with which time in daily life was defined and measured, he still understood the time-scales employed to be arbitrary. This being said, he regarded these convenient measures registered on the face of a clock as “symbols of modern civilisation.”⁵⁰ Yet, while mathematicians measured time, they held it to be indefinable.⁵¹ A turn to philosophical texts on the nature of time furnished only more questions for the mathematician rather than answers. Explaining this problem to the philosophers present at the Aristotelian Society, Greenhill appealed to them to provide the best possible definition of time for he and his fellow mathematicians.⁵² Greenhill’s concern was not with the possibility of measuring time, but with the most suitable definition to employ.

For Hodgson, time-measurement revealed a division between the objective measures of time which was the domain of science and mathematics, and the subjective experience of time as the domain of philosophy. For Greenhill, time-measurement

⁴⁸ Hodgson, “On Some Ambiguities in the Word Time,” *Proceedings of the Aristotelian Society* 1, no. 1 (1887-1888), 71-72. A similar discussion also appeared in his *Metaphysic of Experience* (1898), 139.

⁴⁹ For a discussion of progress in measured more minute periods of time at the Greenwich Observatory see: Simon Schaffer, “Astronomers Mark Time: Discipline and the Personal Equation,” *Science in Context* 2 (1988): 115-145.

⁵⁰ Greenhill, 43.

⁵¹ *Ibid.*, 44.

⁵² *Ibid.*, 50.

appears to have had a similar function. It revealed the need to develop a suitable definition for the phenomena mathematicians and scientists measured with such precision. Yet while Hodgson and Greenhill discussed the philosophical issues time-measurement introduced, several years before, E. Hawksley Rhodes presented a paper at the Aristotelian Society which was subsequently published in *Mind*. Both Greenhill and Hodgson, referred to Rhodes' paper as establishing a clear assessment of the measurement of time and which they both adopted in their work.⁵³ In his essay, Rhodes emphasized the divide between subjective time and objective time which time-measurement devices were responsible for.

According to Rhodes, the unreliability of the senses created the need for time-keeping instruments. Without measuring devices, one's internal sense of time was subject to the emotions and feelings which accompanied experiences. For this reason, instruments for measuring both space and time were necessary to establish a common referent for the varied personal experiences of individuals. Timekeeping devices created objectivity in uniting the internal time notations which accompany experience.⁵⁴ In doing so, they produce order from the perceived chaos of bare experience.⁵⁵ These sentiments were shared among Rhodes' contemporaries. The concerns over the accuracy of public clocks discussed in Chapter Two reveal the important role clock-time played in regulating the lives of many Britons. Only a few months before Rhodes presented his paper at the Aristotelian Society, *Punch* publish the following illustration, commenting on the possible confusion which could arise should the twenty-four hour clock be adopted.

⁵³ *Ibid.*, 46; Hodgson, "Time-Measurement," 78.

⁵⁴ E. Hawksley Rhodes, "The Scientific Conception of the Measurement of Time," *Mind* 10, no. 39 (1885), 352.

⁵⁵ *Ibid.*, 360.



“DOUBLE TIME.”

Figure 4.2 - WHAT'S O'CLOCK?⁵⁶

By the late nineteenth century, clock time regulated public life to such an extent that philosophical societies in Britain included the practical issues of timekeeping in their debates. Clocks had come to represent a metropolitan way of life. The subjective time which preceded any measures stood in stark opposition to this objective time which regulated the community.

Rhodes went so far as to suggest that prior to any method of creating public time measures, humans “must have for ever remained sunk in the ignorance of barbarism, little if at all, elevated above the beasts of the field.”⁵⁷ He appears to have gloried in the possibility of creating time-measures. According to him scientific knowledge particularly, and all knowledge in general, were possible because of the time-

⁵⁶ “What’s O’Clock?” *Punch* 87, December 13, 1884, 277.

⁵⁷ Rhodes, 348.

measurement. Both he and Greenhill esteemed the astronomical observatories and their central goal to determine accurate time measures. They deemed these institutions and the measures they produce symbols of civilization.⁵⁸ For Rhodes, clock-time was a symbol of progress and modernity. Science, knowledge, and civilization depended upon the ability to build objective measures of time. Echoing Hodgson's work, subjective time was constituted by the passage of events in consciousness.⁵⁹ Time-measures were useful only insofar as they tamed the irregularity which existed in experience and provided a repetitive public scale.

The possibility of measuring time became a philosophical problem during the late nineteenth century. Contrasting the experience of time as an unequal flow influenced by emotions, measuring successive identical periods of time led to questions about the basis for measuring time. As Hodgson observed, determining equal durations of successive events must be founded in an event which repeats itself with the smallest amount of change.⁶⁰ Time-measurement represented the basis for knowledge and science for these philosophers. The value of timekeeping devices for these philosophers was their ability to provide regularity where the experience of time could not. In overcoming experience they held an integral role in discovering natural laws and coordinating the interactions of individuals in a community. However, while Rhodes and Greenhill in particular emphasized the role of clocks in measuring time, others looked back to the experiences and sought to determine what role they played as time-measures. For them, the irregularity of subjective time presented itself in places more clearly than the railway.

⁵⁸ *Ibid.*, 361; Greenhill, 46-47.

⁵⁹ Rhodes, 351.

⁶⁰ Hodgson, "Time-Measurement," 79.

WAITING, ANXIETY, AND SUBJECTIVE TIME

As discussed in Chapters Two and Three, users of technological systems like the railway and telegraph encountered a variety of clock times and became both confused and frustrated by irregularity. In confronting a multiplicity of time standards passengers were made more acutely aware of the objective clock times railways operated on. However, the protracted periods of waiting in carriages and at stations also presented the possibility of distinguishing between the objective time of clocks and schedules, and the subjective, personal time which accompanies all experience. Bernard Bosanquet and George J. Romanes were two philosophers who used the railway as a conceptual tool in their philosophical discussions of subjective time. These individuals, working on two different questions in the philosophy of time both evoked the railway as a means of distinguishing subjective and objective time. Their work reveals technology as a useful metaphor, and suggests that practical issues presented abstract questions about time which philosophers grappled with. They demonstrate how philosophers were influenced by personal encounters with industrial technologies.

Published in 1878, in the journal *Mind*, Romanes' paper entitled "Consciousness of Time" appears to have been a one-off foray into the philosophy of time as he does not seem to have treated the subject with detail in any of his other research. Romanes began this paper from the premise that the apprehension of subjective time against clock time "is nothing more than a mental abstraction of the sequence relations among events."⁶¹ That is to say, the experience of duration is a conceptualization of changes undergone by consciousness compared against the time displayed by clocks and watches. The question

⁶¹ George J. Romanes, "Consciousness of Time," *Mind* 3 no. 11 (1878): 297.

then arises as to what value events or perceptions have as time-measures. Is the quantity of events the only factor which influences the consciousness of time, or does the quality of events also affect time measures?⁶² According to Romanes, given the frequency of inconsistencies in estimating time, the quantity of events could not be the only aspect to determine our estimates of time.⁶³ The railway provided the most clear example of this relation between subjective estimates and objective durations. Clark Blaise's comment that railway passengers became hyperconscious of time applies literally to Romanes' experience. He wrote:

[...] how interminable the time seems while we are waiting an hour or two at a country railway station, as compared with a similar interval after we have met a friend in the train and are passing through novel and beautiful scenery.⁶⁴

Given this illustration, it appeared as though "the more vivid the states of consciousness, and the more abrupt their changes, the less is their value as time-measures."⁶⁵ However, Romanes preferred to suggest that changes in consciousness which are not abrupt, have reference mainly to their own passage instead, so that consciousness is self-reflexive. The extent to which events were values of time was determined by the degree of attention one focused on their passage. In the case of waiting at a railway station—as became common practice, especially when trains proved to be unpunctual—consciousness would be more attentive to the passage of time. A feeling of expectation or looking forward to the arrival of a train makes the very passage of events, which constitute the stream of consciousness, the subject of attention.

⁶² *Ibid.*, 297-298.

⁶³ *Ibid.*, 298.

⁶⁴ *Ibid.*, 298.

⁶⁵ *Ibid.*, 299.

Romanes employed another seemingly contradictory example to demonstrate his point about the importance of attention in the private apprehension of time. He wrote:

[...] a day's railway travelling in a new country appears of longer duration than a day which is employed in our ordinary avocations, and especially so to persons who are not accustomed to railway travelling. And this is doubtless due to the comparatively novel order of changes in our states of consciousness which a day's railway travelling entails."⁶⁶

In this case, the vivid and abrupt succession of events which pass by the railway carriage account for the feeling that time is protracted. The novelty of these experiences causes consciousness to be more attentive than to the events which pass ordinarily in a day at work or at home. The experience of railway traveling was a tool with which Romanes analyzed the perception of duration against clock time. Both the rapid passage of the countryside before a passenger's eyes and protracted waiting for trains to arrive provided relatively new experiences which aided in the analysis of time consciousness.

In addition to rushing to meet a train at a station, waiting, either at a station or on a train, proved to be a central aspect in heightening a passenger's awareness of clock time. Awaiting the arrival of trains became a central occupation of the railway traveller. Station clocks and pocket watches counted the passage of time until a train would arrive and measured whether they were on time. Passengers would even record the differences in clock time at various stations.⁶⁷ Whereas initially passengers had been overwhelmed by the rapid succession of the countryside before them, by the late nineteenth century, the experience of rail travel was no longer novel. Passengers looked forward to the termination of their journey and made a habit of checking arrival times against time tables. According to Romanes, the anticipation railway passengers experienced was a

⁶⁶ *Ibid.*, 299-300.

⁶⁷ E.T. Hargraves, "Railway Time," *The Times*, August 19, 1884, 10.

significant factor in the perception of duration. The more one awaits or anticipates the completion of a period of time, or the termination of an event, the longer that period of time takes to pass.⁶⁸ Anticipation and anxiety create a heightened sense of time.

This quantitative relation is to be found in our experiences while railway-travelling; for, however long the journey may be, the latter portion of it seems more tedious than the former. So that for instance, if the journey is of two hours' duration, the last hour seems longer than the first one, but if the journey is of twelve hours' duration the second hour seems no longer than the first one, while the twelfth hour seems very protracted.⁶⁹

He explained that as a passenger becomes conscious of the approaching end of a journey, they begin to anticipate, or look forward to, the end more attentively.

Although such experiences could be had elsewhere, railways brought record numbers of people into the habit of waiting regularly, and nervously, next to each other for protracted periods of time each day. The railway thus provided an example that would have readily appealed to readers, who undoubtedly had similar experiences. Indeed, the experience of variation in objective measures of time even attracted the attention of *Punch*. In a poem entitled "The Slow Train," a passenger related how the commute he was accustomed to riding usually felt exceedingly protracted, sometimes hours or days long. However, one day when seated with a young attractive woman, the train seemed to arrive ahead of time.⁷⁰

⁶⁸ Romanes, 302.

⁶⁹ *Ibid.*, 302.

⁷⁰ "The Slow Train," *Punch* 113, September 11, 1897, 114.

On Southern lines the train which crawl
Deliberately to and fro
Make life a burden; of them all
This is the slowest of the slow.
Impatiently condemned to bear
What is indeed and awful bore,
I've seemed to be imprisoned there
Three days, or more...

The other day I had to come
By this slow train, but facing me
Was no old buffer, dull and dumb;
I chatted with my vis-a-vis.
A pretty smile, a pretty dress,
Gay spirits no fatigue could crush;
With her it was a quick express,
Three minutes' rush.⁷¹

While anticipation and anxiety were important features in the experience of subjective time, according to Romanes, the certainty of an upcoming event's beginning or end was likewise instrumental in determining the value of an event as a time measure.⁷² For railway travellers who experienced regular unpunctuality in the face of highly structured timetables, knowing when a train would arrive could be a trying affair. Romanes knew this and, to ground his speculation, referred to his own experiences when traveling by rail.

I have several times observed that if I know there is an hour to wait for a train, the time seems much longer than if I have to wait an hour for a train which is overdue, and the approach of which—there being no telegraphic communication—the officials are momentarily expecting.”⁷³

When his train's arrival time was not known definitely, Romanes suggests, hope occupied his attention, whereas if the arrival time is known, he had no hope. As a result his

⁷¹ *Ibid.*

⁷² Romanes, 302.

⁷³ *Ibid.*, 302.

thoughts would be self-reflective, thus lengthening the perceived duration until his train's arrival.

Although Romanes' essay dealt with an abstract problem about the value of events in the internal appreciation of clock time, each situation he employed presented itself in the experience afforded by rail travel and the time structures passengers conformed to. In a railway carriage, or at a station, subjective time constituted by the passage of events, is more frequently measured against objective time. However, as passengers learned in anticipation of arriving at their destinations, there is rarely any regularity between public standards and private experience.

More than a decade after Romanes' paper was published in *Mind*, Bernard Bosanquet delivered his Presidential Address to the Aristotelian Society entitled "Time and the Absolute." Therein he adopted many of the views that the preceding President, Hodgson, had been developing since the 1860s. One major difference, however, was that Bosanquet engaged the technological metaphor whereas Hodgson did so rarely and only subtly. Bosanquet began his address by telling the society "the Problem of Time has of late attracted attention, and it is natural that I should refer to it in today's address."⁷⁴ This problem which was the topic of his discussion concerned the role of time in experience. According to Bosanquet this question was all-important, for the temporally oriented consciousness was the culmination of the civilized world of clocks and timetables.⁷⁵ For Bosanquet, the growing emphasis on objective time-measures demanded an equal and what may be deemed reactionary examination of subjective time.

⁷⁴ Bernard Bosanquet, "Presidential Address: Time and the Absolute," *Proceedings of the Aristotelian Society* 3, no. 2 (1895-1896), 3.

⁷⁵ *Ibid.*, 3-4.

Bosanquet served as the second President of the Aristotelian Society from 1894 until 1898 following the fourteen-year presidency of Hodgson. Following Hodgson as president and serving as Vice President beginning in 1888, it is little surprise that Bosanquet was also one of Hodgson's most notable supporters next to William James. Together with Hodgson, Bosanquet was part of a small group of British philosophers who wrote for a general reading public.⁷⁶ Furthermore, making his inclusion all the more appropriate, Bosanquet was another of the Victorian philosophers to have been largely forgotten within several years after his death. While he promoted the speculative philosophy which Hodgson placed at the fore of the Aristotelian Society's meetings, he was more willing than Hodgson to engage with concrete encounters in his analysis of experience. Not surprisingly, Bosanquet's philosophy bears Hodgson's mark. As in the Kantian strain of Hodgson's philosophy, time was constituted as a whole. Discrete events, and the distinction between past, present, and future were added by an act of attention. Following the idealist tradition, time as duration, according to Bosanquet, was a synthesis of continuity and succession. Both elements were equally necessary to the constitution of time in human experience.⁷⁷

Like Romanes, Bosanquet employed technology to emphasize the distinction between subjective and objective time. The time of clocks, calendars and timetables he argued "reduce[s] our private experience of duration to an abstract standard," yet, "[...] for the purpose of a common measure... this is plainly necessary."⁷⁸ However, unlike Rhodes and Greenhill, Bosanquet perceived public time-measures as detrimental to the

⁷⁶ Thomas W. Stanley, "Keeping Philosophy in *Mind*: Shadworth H. Hodgson's Articulation of the Boundaries of Philosophy and Science," *Journal of the History of Ideas* 70, no. 2 (2009), 295-296; William Sweet, "Rediscovering Bosanquet," in *Bernard Bosanquet and the Legacy of British Idealism*, ed. W. Sweet (Toronto: University of Toronto Press, 2007), 3.

⁷⁷ Bosanquet, 4.

⁷⁸ *Ibid.*, 4.

more immanent time which constitutes all experience. Timekeeping devices which composed Bosanquet's "civilized world" were an affront to the subjective experience of time which could not be reconciled with clock time. Railways provided Bosanquet with the possibility of distinguishing the two times. The railway, which brought standard time in timetables and station clock, was also a space in which anticipation influenced the personal experience of time despite the presence of numerous clocks and watches. He wrote, "I may live a lifetime of anxiety while the train brings me from Oxford to London, but the hour and a quarter measured against the earth's rotation will be an hour and a quarter still."⁷⁹ As the railway revealed a divorce between objective time that regulated the civilized world and subjective time, Bosanquet asserted the priority of the personal experience of time.

Although he acknowledged that public standards were practical in coordinating one's movements in an increasingly complex society Bosanquet urged his audience to be wary stating, "[w]e have to resist the mutilation of experience which is carried on under the name of reduction to an objective standard."⁸⁰ This mutilation was a product of dependence on timetables and clocks, rather than the experience of succession itself as the measure of time. He lamented to his audience, "*our* Time view acquires its character much more from our attention running to and fro along the chronological chart than from our own experience of succession, which all this chronology and construction really tends to dwarf."⁸¹ While private time was more real than public time, users of technology found that it appeared to dominate the subjective ways of experiencing and expressing time. Technology or the mechanical world as he termed it removed one from real

⁷⁹ *Ibid.*, 4.

⁸⁰ *Ibid.*, 5.

⁸¹ *Ibid.*, 6.

experience founded in a subjective time feeling. Therefore the use of abstract standards was conceived as an attack on the origins of experience itself.

Continuing Hodgson's analysis, Bosanquet held that time only existed in unifying discrete events into a succession. Thus, the greatest challenge objective clock time posed to the subjective time-feeling was the reduction of experience into many discrete units. In reality, individual moments are merely the product of mechanical devices and mathematical formulae. Bosanquet, like Hodgson, argued that the present was not itself a moment without duration. Because the present as experienced was a synthesis of past and future, it was extended. Clock time attacked this, and the railway with its timetables and schedules appeared to Bosanquet as the mechanical world which undermines the position of time in experience. Contrasting E. P. Thompson's argument that time-discipline was imposed by factory owners, Bosanquet reveals that a heightened awareness of and anxiety about clock time had developed through interactions with clocks, timetables, and railways. Though some chose to retain their local times, passengers appropriated particular clock times through their use of railways. However, these objective measures could still be oppressive regardless of whether they were imposed or appropriated.

CONCLUSIONS

By 1900 the foundations of a global cultural movement which rejected public time structures and incorporated a feeling of time which was based in experience into literary works, art, science, and psychology.⁸² However, prior to this philosophers living

⁸² See: Kern and Miller.

in the Britain of railways, telegraphs, and GMT, began to theorize about the ebb and flow of the experience of time and how this experience related to the temporal orders which were begin constructed around them. Though these technologies were no longer novel, and the issues of railway punctuality, the accuracy of schedules, timetables, public clocks, and the plurality of times that could be accessed through these technologies were a continuing matter of public concern.

Dodgson presented a new time stream to his audience that flowed against the clock and against the rules of causality. According to Hodgson, the experience of time was not made up of minute divisions similar to those produced by the ticking of a clock. Rather, time was fluid and the present had duration. Similarly, the railway journey blended the divisions in passing scenery, and feelings of anticipation and anxiety while travelling made objective clock durations appear as though they lasted a lifetime. While Hodgson did not explicitly include the railway as a conceptual tool in his work, time-measurement marked a boundary to distinguish the speculative work of philosophy and the empirical projects of physical science.

For others clocks and watches presented a different distinction altogether. Greenhill contrasted the rigidity with which clock time was defined by Parliament with the plurality of definitions which existed to explain what time itself was. According to Rhodes, public time reckoning was not only convenient but a prerequisite for humanity's material progress. Clocks tamed and ordered the chaotic world of subjective time experiences. Contrary to Greenhill and Rhodes, Romanes and Bosanquet sought to understand how experience contributed to an appreciation of the passage of clock time. Furthermore they provide a concrete example of how the railway could influence

philosophical discussions of time. For Bosanquet and Romanes, the railway marked a boundary between the objective time displayed by clocks, and the personal experience of time. Beyond being merely a metaphor or conceptual tool, however, the railway journey created subjective experiences of time which opposed the objective clock time it employed. As clocks and timetables became more common in daily life during the late nineteenth century, they presented the opportunity to reflect on time as experienced without these objective markers.

CHAPTER FIVE: CONCLUSION

By 1900 technological systems had established the grounds for a major reconceptualization of time. In 1905 a patent clerk, whose family owned a company that built instruments to measure electricity similar to those used in electrical timekeeping devices, would publish a paper and revolutionize time in physics. This clerk was employed in Bern, a city which had been establishing its own network of synchronized clocks. Interestingly, patent applications for systems used to coordinate clocks telegraphically increased during his employment at the patent office climaxing in 1904.¹ He was neither a stranger to seeing coordinated clocks in action, nor to understanding the mechanics which made them operate. This clerk's name was Albert Einstein, and in defining simultaneity for the purpose of his foundational paper he employed the railway. "If, for instance, I say, 'That train arrives here at 7 o'clock,' I mean something like this: 'The pointing of the small hand on my watch to 7 and the arrival of the train are simultaneous events.'"² According to Peter Galison, Einstein's work on the relativity of time was inspired by his experience as a patent clerk in Bern. This was an example of what Galison calls "cross-talk between machines and theory."³ He argues that the technological problems Einstein encountered while reviewing patent applications prompted his work in theoretical physics.⁴

At the beginning of the nineteenth century a global movement was underway which assessed the meaning of space and time. This movement was grounded in a rejection of public time measures. It attacked them as arbitrary and looked to the

¹ Galison, 248, 250.

² Albert Einstein, "On the Electrodynamics of Moving Bodies," in *The Principle of Relativity*, ed. A. Sommerfeld, trans. W. Perrett and G. B. Jeffery (New York: Dover, 1952), 39.

³ Galison, 251.

⁴ *Ibid.*, 325.

experience of subjective time. Novelists, psychologists, philosophers, painters, and physicists expressed representation of subjective time in their work.⁵ Prior to the existence of this global movement, in Britain nineteenth-century cultural representations of time were bound up with technology. A “cross-talk” between technology and ideas, similar to that described by Galison existed in print media addressing the questions of the experience, measurement, and use of time. By 1870 this reexamination of time was already underway in Britain. Technologies such as the railway, telegraph, and mechanical clock complicated the experience of time for Britons and provoked a cultural movement which existed largely in print media.

This paper began with two questions inspired by E. P. Thompson: *How far did technological systems influence the apprehension of time? Furthermore, to what extent was this influence evidenced in the medium of print?*⁶ In attempting to answer these questions, this paper has argued that interactions with industrial technologies—namely the railway, telegraph, and mechanical clock—precipitated a new experience of time presented in philosophical texts, fiction, and popular concerns about punctuality and public timekeeping recorded in newspapers. Encounters with these technological systems complicated the experience of time in three ways: (1) an initial heightening of time-awareness, (2) an emphasis on clock synchrony and standardization, and finally (3) the realization—aided by the heightening of time-awareness—that attempts to satiate the desire for clock synchrony had failed meant that Britons encountered a plurality of clock times which confused them. Contemporaries recognized these issues; they influenced a “cross-talk” in which new ideas about the experience of time were related back to

⁵ See: Gay, Kern, and Miller.

⁶ Thompson, 57.

technologies. Subjective representations of time only appeared as something noteworthy out of more rigid attempts to enforce public time.

Acclimatizing to new travel speeds was difficult, but soon passengers demanded both speed and regularity.⁷ British railway passengers developed a heightened awareness of time which they required to navigate timetables and catch trains. This was evinced in passengers' concerns over the punctuality of trains. Travelers wrote to newspapers expressing their indignation at railway companies' seeming disregard for arrival and departure times. Passengers appealed to timetables as a means of gauging punctuality and their attempts to hold companies accountable were part of a larger negotiation over shared norms of punctuality. Yet, while passengers helped to establish acceptable social mores, railways, clocks, and timetables made these discussions possible. That is, technologies were not merely the loci for debates about time, but were active participants. Clocks told time, timetables announced when a train *should* arrive. These items communicated vital information to travelers and trains made both clock time and timetables more relevant to a growing number of Britons throughout the nineteenth century.⁸

Material objects were also active in promoting the homogenization of clock time during the nineteenth century. Long before the development of World Standard Time, railway passengers in Britain began navigating between local times and railway time. By mid-century GMT was established as the operating time for railways and the GPO. Station clocks and timetables like *Bradshaw* were instrumental in spreading the use of GMT among railway passengers, and the railway itself contributed to the diffusion of

⁷ Schivelbusch, 165.

⁸ According to Jack Simmons in 1871, Britons took 13.8 railway trips per capita. By 1891 this figure had jumped to 24.9. Simmons, 342.

GMT in daily life. While it was the passenger's prerogative to give up local time—and possibly a watch with two minute hands—railways presented the need for such a decision. Even if, according to Ben Marsden and Crosbie Smith, railway companies owned time, I argue that passengers did not employ GMT at the behest of companies.⁹ Rather, as standard times became more common by the end of the century in public clocks and post office telegrams, passengers gradually gave up the plurality of clock times they kept as a means of simplifying their commutes. However, when passengers looked to public clocks they did not always find the unity they had been promised.

As railways and telegraphs were homogenizing clock times into a single national standard, they also brought passengers into contact with a plurality of clock times. Erroneous clocks and time distribution systems heightened the already alarming panic of passengers who were anxious about the punctuality of trains. Indeed, when coordinating systems failed and discord became evident, passengers themselves complained. In demanding the accuracy of clock times, passengers contributed to the validity of GMT. Rather than having standardized time imposed on them, travellers were active participants in bringing about its widespread acceptance. Only in passengers' giving up the dichotomy of local and railway time was GMT accepted. This, however, did not mean that passengers could not feel oppressed by clock time. In fact the very feeling of anxiety over punctuality and the accuracy of clocks was an instance of this feeling of oppression. Therefore, in actively constructing time-disciplines which railways operated on, passengers helped to build a system they later found disconcerting.

⁹ Marsden and Smith, 159.

While these practical concerns were discussed widely in newspapers and other periodicals, user interactions with technology were also incorporated in works of fiction. Technological systems presented opportunities of mobility and communication, however, social norms—like those negotiated by passengers over punctuality—had to be observed. Mary Howarth’s story “The Telegram” demonstrated that while the telegraph presented possibilities of escaping traditional spatio-temporal limitations, without proper caution taking advantage of such opportunities could be disastrous. Similarly, Rudyard Kipling addressed the British preoccupation with railway punctuality directly. He defined the notion of punctuality as something inherently British. In “An Error in the Fourth Dimension” even the most ardent anglophile could hardly penetrate the awkward obsession with railway schedules and timing germane to British railway travelers. Users generated cultural values through their interactions with technologies. For those not accustomed to railways and telegraphs, new ways of using time could be troubling. Yet the mere presence of a railway or telegraph cable did not necessitate a reorganization of time reckoning. It was the particular engagement of habitual or regular users with technological systems which created new time-disciplines.

In Thomas Hardy’s semi-fictional Wessex this relationship was clear. In his Wessex novels Hardy used the railway as a means of distinguishing between two worlds: urban and rural. These novels were set in the English countryside where the railway had made appearances but had yet to reorganize the lives of inhabitants. Trains represented the limits of Wessex both geographically and technically. The agrarian communities lived a slower life in which clock time was of little importance. Discord existed between individuals’ time standards and it caused few if any problems. The people of Wessex

learned to live with a plurality of clock times by waiting patiently, contrasting railway passengers for whom unannounced delays were odious. Hardy's use of the railway to create a world in which time was understood differently points to contemporaries' awareness of the impact of technology on time-awareness. Hardy perceived the railway as a modernizing machine; however, time-discipline did not simply arrive with the railway. As Hardy depicted in Wessex, the railway could be present and yet at the same time have little impact on way people lived. Most of his characters were seldom, if at all, passengers on trains. Without a direct and regular engagement with technology, the inhabitants of Wessex were largely uninfluenced by the time-sense which tended to accompany railways.

Hardy's depiction of Wessex points to another question: how did non-users conceive of these issues in the late nineteenth century? While Hardy presumably recreated the time-awareness of Wessex from the memory of his childhood, after living in London from 1862 until 1867, he moved between London and Dorset during his adult life while writing.¹⁰ Should he be considered as writing from the perspective of a user of these industrial technologies or from the perspective of rural life? Whereas this research has mainly focused on users' reactions to, and their role in the creation of, time-disciplines, further research should address the views of non-users more directly.¹¹ This would provide clearer insight into how far the railway and telegraph could influence time-awareness.

¹⁰ Plietzsch, 1; Michael Millgate, "Hardy, Thomas (1840–1928)," *Oxford Dictionary of National Biography*, online edition. (Oxford University Press, 2006). www.oxforddnb.com.

¹¹ I suggest that looking to public clocks in parishes when and where railways had yet to arrive and determining whether they kept local or Greenwich time might indicate the extent to which new time-disciplines spread beyond the reach of railways and telegraphs.

Although the characters in Hardy's novels seldom took advantage of the possibilities which railways and telegraphs had to offer, the protagonist of Wells' fiction sought more power over time than these systems could provide. While many of his contemporaries discussed the annihilation of time by technologies of communication and transportation, Wells imagined a machine capable of controlling time. Again a specific relationship between users and technology appeared. Wells captured late nineteenth-century Britons' preoccupation with the technologies which extended their possibility of controlling nature. Yet the inventor's machine neither relieved him from the anxieties which accompanied nineteenth-century travel, nor did it annihilate time. Rather the time machine revealed to its user that time could not be controlled and technology would inevitably betray humanity.

Users of the railway and telegraph developed special relationships with a new time-awareness. By both increasing the speed of travel and communication and making distances seem smaller, these technologies of time created a new temporal landscape in which users became engaged. While it seemed as though railways and telegraphs had annihilated traditional experiences of time, they strengthened a social time based on mechanical clocks and timetables and contemporaries recognized this. While some chose to contest the lack of punctuality common on railways, others incorporated the new experience of time in fictional texts. These commentaries suggest that many contemporaries were cognizant of the time-disciplines emanating from technological networks. They also reveal that as passengers and senders of telegrams these individuals played an active part in strengthening a mechanical social time. Those who did not access these systems encountered a less rigid and more flexible time-sense.

Whereas Glennie and Thrift have argued, contra Thompson, that the introduction of clock time during the eighteenth century was not oppressive, philosophical discussions of time suggest that some individuals found the new social time oppressive indeed. According to Hannah Gay, the relativism that became popular by the end of the century was only possible because of the growing emphasis on homogeneity.¹² Philosophical questions about time were founded in encounters with new methods of counting time. Synchronization thus provided the opportunity to examine asynchrony. New philosophical ideas about the subjective experience of time and how this is constituted in relation to objective clock time were themselves the product of new ways of experiencing time. Questions about time were a product of a larger experience.

The technological changes of the nineteenth century unleashed a restructuring of the dimensions of space and human mobility. Contemporaries looked to scientific and technological metaphors to explain this new experience of time that technologies offered. Shadworth Hodgson stands out as one individual who worked on the problem of the experience of time between 1865 and 1898. His perspective on how time was constituted in experience appears to have flowed directly from the railway journey although, much like other thinkers from the movement which bracketed the turn of the twentieth century outside Britain, he did not refer to the influence technology explicitly in his writing. Hodgson contrasted the erroneous belief that time consisted of divisions, with a view of time as experienced. It consisted of a stream or train of events which blended into each other. Only in comparing the order of these events as they appeared and receded from attention did the feeling of time, of past and future, exist.¹³ More importantly, he

¹² Gay, 139.

¹³ Hodgson, *The Philosophy of Reflection*, 253-254.

conceived of the present as a duration rather than an instant registered on the face of a clock.¹⁴ In the railway journey, perceptions blended together as they passed by a carriage window. Passengers developed the ability to avoid the nausea which originally accompanied this experience by attending to the background, dividing their perceptions. This travel experience translated into a new way of understanding the internal experience of time then being undercut by railway clocks and timetables.

The railway was a meeting place for objective and subjective time. This was made explicit in the writings of Bernard Bosanquet and George Romanes. Like Hodgson, they enquired into the role of experience in constituting time. However, they juxtaposed the experience of time with the measurement of time in clocks. For Bosanquet especially, clock time undermined experience and it was to be guarded against.¹⁵ For some late nineteenth-century philosophers who reexamined the status of time, railways and time measurement provided both a metaphor with which to analyze the problem and the impetus for delving into the problem in the beginning. These philosophical questions were not separate from social and cultural ones. Akin to the experience of railway unpunctuality, this philosophical debate about time was lived by its participants.

In examining the discussion of time in print, this research has aimed to approach the railways and telegraphs as technologies of time. That is, railways and telegraphs engendered a new experience of time among users which was carried into accounts of these technologies in print. Published print material was selected as the basis for

¹⁴ Hodgson, *The Metaphysic of Experience*, 136-137.

¹⁵ Bosanquet, 5-6.

assessing these late nineteenth-century experiences of time as a means of connecting the ideas behind this movement to a medium which was also important in fostering it. Print material was central to both the expression and diffusion of time-disciplines. The number of periodicals in circulation and how quickly they could be distributed increased throughout the nineteenth century.¹⁶ Much of this had to do with the time spent in railway carriages reading. There was a higher public demand for newspapers, and journals to be read while travelling. Consequently, this research has largely considered materials written by passengers, for passengers. Novels, serial publications, and newspaper reveal a discussion centered around technologies which permitted the reexamination of time. Railways were one subject of the debates which appeared in published material digested while railway travelling.

Although situated in a discussion which occurred in print, this paper has focused on interactions between people as users of technology, the technological systems which they used, and the beliefs about time which they jointly produced. It has adopted a soft variety of technological determinism which argues that technological networks should be considered forces of historical change through their role in dictating humans' environment.¹⁷ In addition, it has adopted the view of technologies as active agents which influence others. Bruno Latour has described this as "making-do." He differentiates this phrase from previous means of explaining social change by removing the element of dominance or control over others.¹⁸ Rather mutual relations of influence exist between individuals in networks of interaction. Therefore, technologies which

¹⁶ Simmons, 242-243, 246; Freeman, 86, 89.

¹⁷ R. L. Heilbroner, "Technological Determinism Revisited," in *Does Technology Drive History?: The Dilemma of Technological Determinism*, ed. Merrit Roe Smith and Leo Marx (Cambridge: MIT Press, 1994), 69.

¹⁸ Bruno Latour, *Reassembling the Social: An Introduction to Actor Network Theory* (New York: Oxford University Press, 2005), 216-217.

influenced a social and a cultural redefinition of time were as much a part of the negotiations over punctuality, time standards, and private time as railway companies and passengers. Railways and telegraphs not only changed the landscape by presenting new possibilities of travel and communication—which made questions of punctuality and coordination relevant—but they communicated with users over the issue of time standards. Clocks epitomize this view of technology. Unlike other forms of measurement they actively produce measures of time and register them in public. As participants in negotiations over time standardization and synchronization, clocks promoted the objective homogeneous time they were supposed to display. However, through clock error—asynchrony, dual minute hands—and heightened passenger concern over punctuality, timekeeping devices equally contributed to a growing attention to the subjective experience of time.

BIBLIOGRAPHY

Acts of Parliament

Railway Regulation Act, 1844, 7 & 8 Vict., c. 85.

The Telegraph Act, 1868, 31 & 32 Vict., c. 110.

Statutes (Definition of Time) Act, 1880, 43 & 44 Vict., c.9.

Cheap Trains Act, 1883, 46 & 47 Vict., c. 34.

Regulation of Railways Act, 1889, 52 & 53 Vict., c. 57.

Newspapers

The Aberdeen Journal.

The Daily News.

The Pall Mall Gazette.

The Times.

The Western Mail.

Journals

The British Medical Journal.

Fun.

Funny Folks.

The Law Times Review (L.T.R.).

Mechanics' Magazine.

Mind: A Quarterly Review of Psychology and Philosophy.

Moonshine.

Nature: International Weekly Journal of Science.

Proceedings of the Aristotelian Society for the Systematic Study of Philosophy.

Punch, Or the London Charivari.

The Solicitors' Journal (Sol. J.).

Primary Sources

Airy, George Biddell. *Autobiography*. Edited by Wilfrid Airy. Cambridge: Cambridge University Press, 1896.

Bosanquet, Bernard. *Psychology of the Moral Self*. London: MacMillan and Co., 1897.

Carroll, Lewis. "Alice's Adventures in Wonderland," in *The Philosopher's Alice*. Edited by Peter Heath. New York: St. Martin's Press, 1974.

———. *Lewis Carroll's Games and Puzzles*. Edited by Edward Wakeling. New York: Dover Publications Inc., 1992.

———. "Through the Looking Glass." In *The Philosopher's Alice*. Edited by Peter Heath. New York: St. Martin's Press, 1974.

Dickens, Charles. *Dombey and Son*. New York: John W. Lovell Company, 1883.

Dodgson, Charles Lutwidge. *The Mathematical Recreations of Lewis Carroll: Pillow Problems and A Tangled Tale*. New York: Dover Publications, Inc, 1958.

———. "Phantasmagoria." In *The Collected Verse of Lewis Carroll*. London: MacMillan and Co., 1932.

———. "Punctuality." In *The Collected Verse of Lewis Carroll*. London: MacMillan and Co., 1932.

Einstein, Albert. *The Principle of Relativity*. Edited by A. Sommerfeld. Translated by W. Perrett and G.B. Jeffery. Mineola: Dover Publications, 1952.

Hardy, Thomas. *Far from the Madding Crowd*. Edited by Robert C. Schweik. New York: W. W. Norton & Company, 1986.

———. *Jude the Obscure*. Edited by Cedric Watts. Peterborough: Broadview Literary Texts, 1999.

- . *The Mayor of Casterbridge: The Life and Death of a Man of Character*. London: MacMillan and Co., 1902.
- . *The Return of the Native*. Toronto: MacMillan Company of Canada, 1911.
- . *Tess of the D'Urbervilles* 5th edition. New York, Nelson Doubleday, Inc., 1912.
- Hodgson, Shadworth Hollway. *Metaphysic of Experience*. Volume 1. London: Longmans, Green and Co., 1898.
- . *Time and Space*. London: Longmans, Green and Co., 1865.
- . *The Philosophy of Reflection*. London: Longmans, Green and Co., 1878.
- Howarth, Mary. "The Telegram." *The Pall Mall Magazine* 6 (1895): 355-364.
- Kipling, Rudyard. "An Error in the Fourth Dimension." In *The Day's Work* 5th edition. New York: Doubleday and McClure Co., 1898: 337-359..
- . "The Deep-Sea Cables." In *A Song of the English*. New York: Doubleday Page & Company, 1909.
- Mair, Robert Henry, ed., *Debrett's House of Commons and the Judicial Bench*. London: Dean and Son, 1886.
- O'Connor, T. P. "The New Journalism." *The New Review* 1, no. 5 (1889): 423-434.
- Romanes, George J. "Consciousness of Time." *Mind* 3, no. 11 (1878): 297-303.
- Stevenson, Robert Louis. "From a Railway Carriage." In *A Child's Garden of Verses*. London: Longmans, Green, and Co., 1885, 45.
- Wells, H. G. "The Chronic Argonauts." In *The Time Machine: An Invention' A Critical Text of the 1895 London First Edition*. Edited by Leo Stover. London: McFarland and Company, Inc., 1993.
- . *Tales of Space and Time*. New York: Harper & Brothers Publishing, 1900.
- . *The Time Machine: An Invention*. Edited by Nicholas Ruddick. Peterborough: Broadview Press Ltd., 2001.

Secondary Sources

Aldcroft, Derek H. *British Railways in Transition*. Toronto: St. Martin's Press, 1968.

Andersen, Holly K. and Rick Grush. "A Brief History of Time-Consciousness: Historical Precursors to James and Husserl." *Journal of the History of Philosophy* 47, no. 2 (2009): 277-309.

Aveni, Anthony. *Empires of Time: Calendars, Clocks, and Cultures*. New York: Basic Books, 1989.

Bagwell, Philip S. *The Transportation Revolution from 1770*. London: B.T. Batsford Ltd, 1974.

Bartky, Ian. "The Adoption of Standard Time." *Technology and Culture* 30, no. 1 (1989): 25-56.

———. "The Invention of Railroad Time." *Railroad History* 148 (1983): 13-22.

———. *Selling the True Time: Nineteenth-Century Timekeeping in America*. Stanford: Stanford University Press, 2000.

Bennett, J. A. "George Biddell Airy and Horology." *Annals of Science* 37, no. 3 (1980): 269-285.

Berger, Peter L. and Thomas Luckmann. *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. New York: Anchor Books, 1967.

Bijker, Wiebe E. *Of Bicycles, Bakelites, and Bulbs: Toward a Theory Sociotechnical Change*. Cambridge: MIT Press, 1995.

Bingham, Adrian. *Gender, Modernity, and the Popular Press in Inter-War Britain*. Toronto: Oxford University Press, 2004.

Blaise, Clark. *Time Lord: The Remarkable Canadian Who Missed His Train and Changed the World*. Toronto: Alfred A. Knopf Canada, 2001.

Brightfield, Myron F. "The Coming of the Railroad to Early Victorian England, as Viewed by Novels of the Period 1840-1870." *Technology and Culture* 3, no. 1 (1962): 45-72.

Brown, Alan Willard. *The Metaphysical Society: Victorian Minds in Crisis, 1869-1880*. New York: Octagon Books, 1973.

Brown, Lucy. *Victorian News and Newspapers*. Oxford: Clarendon Press, 1985.

- Buckley, Jerome Hamilton. *The Triumph of Time: A Study of the Victorian Concepts of Time, History, Progress and Decadence*. Cambridge: Harvard University Press, 1966.
- Butcher, William. *Verne's Journey to the Centre of the Self: Space and Time in the Voyages Extraordinaires*. London: The MacMillan Press Ltd., 1990.
- Chapman, A. "Standard time for all: the electric telegraph, Airy, and the Greenwich Time Service." In *Semaphores to Short Waves: Proceedings of a Conference on the Technology and Impact of Early Telecommunications*. Edited by Frank James. London: Royal Society for the encouragement of Arts, Manufactures & Commerce, 1998.
- Cipolla, Carlo M. *Clocks and Culture 1300-1700*. London: Collins, 1967.
- Creet, Mario. "Sanford Fleming and Universal Time." *Scientia Canadensis* 14, no. 1 (1990): 66-90.
- Cohen, Morton N. "Dodgson, Charles Lutwidge [Lewis Carroll] (1832–1898)." *Oxford Dictionary of National Biography*. Online edition. Oxford University Press, 2004). www.oxforddnb.com.
- Currie, Mark. *About Time: Narrative, Fiction and the Philosophy of Time*. Edinburgh: Edinburgh University Press, 2007.
- Dohrn-van Rossum, Gerhard. *History of the Hour: Clocks and Modern Temporal Orders*. Translated by Thomas Dunlap. Chicago: University of Chicago Press, 1996.
- Dyos, H. J. "Workmen's Fares in South London, 1860 1914." *Journal of Transport History* 1, no. 1 (1853): 3-19.
- Elias, Norbert. *Time: An Essay*. Translated by Edmund Jephcott. Cambridge: Basil Blackwell, 1992.
- Esbester, Mike. "Designing Time: The Design and Use of Nineteenth-Century Transport Time Tables." *Journal of Design History* 22, no. 2 (2009): 91-113.
- Fayter, Paul. "Strange New Worlds of Space and Time: Late Victorian Science and Science Fiction." In *Victorian Science in Context*. Edited by Bernard Lightman. Chicago: The University of Chicago Press, 1997.
- Flaherty, Michael G., & Michelle D. Meer. "How Time Flies: Age, Memory, and Temporal Compression." *The Sociological Quarterly* 35, no. 4 (1994): 705-721.

- Frasca-Spada, Marina and Nicholas Jardine. *Books and the Sciences in History*. New York: Cambridge University Press, 2000.
- Freeman, Michael. *Railways and the Victorian Imagination*. New Haven: Yale University Press, 1999.
- Galison, Peter. *Einstein's Clocks, Poincaré's Maps: Empires of Time*. New York: W. W. Norton & Company, 2003.
- Gay, Hannah. "Clock Synchrony, Time Distribution and Electrical Timekeeping in Britain 1880-1925." *Past & Present* 181, no. 1 (2003): 107-140.
- Gibbons, Tom H. "Cubism and 'The Fourth Dimension' in the Context of the Late Nineteenth-Century and Early Twentieth-Century Revival of Occult Idealism." *Journal of the Warburg and Courtauld Institutes* 44 (1981): 130-147.
- Gibbins, John R. "Venn, John (1834-1923)." *Oxford Dictionary of National Biography*. Online edition. Oxford University Press, 2006. www.oxforddnb.com.
- Glennie, Paul and Nigel Thrift. "Reworking E. P. Thompson's 'Time, Work-discipline and Industrial Capitalism.'" *Time and Society* 5, no. 3 (1996): 275-299.
- . *Shaping the Day: A History of Timekeeping in England and Wales, 1300-1800*. New York: Oxford University Press, 2009.
- Good, Richard. *Victorian Clocks*. London: British Museum Press, 1996.
- Goodman, Edward C., ed. *Writing the Rails: Train Adventures by the World's Best-Loved Writers*. New York: Black Dog & Leventhal Publishers, Inc., 2001.
- Harvey, David. *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change*. Cambridge: Basil Blackwell, 1989.
- Harvie, Christopher. "'The Sons of Martha': Technology, Transport, and Rudyard Kipling." *Victorian Studies* 20, no. 3 (1977): 269-282.
- Haynes, Roslynn D. *H. G. Wells: Discoverer of the Future: The Influence of Science on his Thought*. New York: New York University Press, 1980.
- Headrick, Daniel. *The Tentacles of Progress: Technology Transfer in the Age of Imperialism, 1850-1914*. New York: Oxford University Press, 1988.
- . *When Information Came of Age: Technologies of Knowledge in the Age of Reason and Revolution*. New York: Oxford University Press, 2000.

- Heilbroner, R. L. "Technological Determinism Revisited." In *Does Technology Drive History?: The Dilemma of Technological Determinism*. Edited by Merrit Roe Smith and Leo Marx. Cambridge: MIT Press, 1994: 67-78.
- Hill, Donald L. "Kipling in Vermont." *Nineteenth-Century Fiction* 7, no. 3 (1952): 153-170.
- Howse, Derek. *Greenwich Time and the Discovery of Longitude*. Toronto: Oxford University Press, 1980.
- Hylton, Peter. *Russell, Idealism, and the Emergence of Analytic Philosophy*. New York: Oxford University Press, 1990.
- Jones, Aled. *Powers of the Press: Newspapers, Power and the Public in Nineteenth-Century England*. Brookfield: Ashgate Publishing Company, 1996.
- Kern, Stephen. *The Culture of Time and Space 1880-1918: with a new preface*. Cambridge: Harvard University Press, 2003.
- Kieve, Jeffrey. *The Electric Telegraph in the U.K.: A Social and Economic History*. New York: Harper and Rowe, 1973.
- Kirsch, Scott. "The Incredible Shrinking World? Technology and the Production of Space." *Environment and Planning D: Society and Space* 13, no. 5 (1995): 529-555.
- Landes, David S. *Revolution in Time: Clocks and the Making of the Modern World*. Cambridge: Harvard University Press, 1983.
- Latour, Bruno. *Reassembling the Social: An Introduction to Actor Network Theory* (New York: Oxford University Press, 2005)
- Luckmann, Thomas. "The Constitution of Human Life in Time." In *Chronotypes: The Construction of Time*. Edited by John Bender and David E. Wellbery. Stanford: The Stanford University Press, 1991: 151-166.
- Manlove, Colin. "Charles Kingsley, H.G. Wells and the Machine in Victorian Fiction." In *H.G. Wells*. Edited by Harold Bloom. Philadelphia: Chelsea House Publishers, 2005: 11-33.
- Marsden, Ben and Crosbie Smith. *Engineering Empires: A Cultural History of Technology in Nineteenth-Century Britain*. New York: Palgrave Macmillan, 2005.

- Marvin, Carolyn. *When Old Technologies Were New: Thinking About Electrical Communication in the Late Nineteenth Century*. New York: Oxford University Press, 1988.
- Marx, Karl. *Grundrisse: Foundations of the Critique of Political Economy*. Translated by Martin Nicolaus. New York: Vintage, 1973.
- Menke, Richard. *Telegraphic Realism: Victorian Fiction and Other Information Systems*. Stanford: Stanford University Press, 2008.
- Miller, Arthur I. *Einstein, Picasso: Space, Time, and the Beauty That Causes Havoc*. New York: Basic Books, 2001.
- Millgate, Michael. "Hardy, Thomas (1840–1928)." *Oxford Dictionary of National Biography*. Online edition. Oxford University Press, 2006. www.oxforddnb.com.
- Morus, Iwan Rhys. "The Nervous System of Britain: Space, Time and the Electric Telegraph in the Victorian Age." In *The British Journal for the History of Science* 33, no. 4 (2000): 455-475.
- Mumford, Lewis. *Technics and Civilization*. New York: Harcourt Brace & Company, 1963.
- Mussell, James. *Science, Time and Space in the Late Nineteenth-Century Periodical Press: Movable Types*. Burlington: Ashgate Publishing Limited, 2007.
- Øhrstrøm, Peter and Per F. V. Hasle. *Temporal Logic: From Ancient Ideas to Artificial Intelligence*. Norwell: Kluwer Academic Publishers, 1995.
- Otis, Laura, ed. *Literature and Science in the Nineteenth Century: An Anthology*. New York: Oxford University Press, 2002.
- Parrinder, Patrick. *Shadows of the Future: H. G. Wells, Science Fiction, and Prophecy*. Syracuse: Syracuse University Press, 1995.
- Plietzsch, Birgit. *The Novels of Thomas Hardy as a Product of Nineteenth-Century Social, Economic, and Cultural Change*. Berlin: Tenea, 2005.
- Pollins, Harold. *Britain's Railways: An Industrial History*. Newton Abbot: David and Charles Publishers Limited, 1971.
- Ratcliff, Jessica. *The Transit of Venus Enterprise in Victorian Britain*. London: Pickering and Chatto, 2008.

- Rooney, David and James Nye. "'Greenwich Observatory Time for the public benefit': standard time and Victorian networks of regulation." *British Journal for the History of Science* 42, no.1 (2009): 5-30.
- Rose, Mark. *Alien Encounters: Anatomy of Science Fiction*. Cambridge: Harvard University Press, 1981.
- Russell, W. M. S. "Time Before and After 'The Time Machine.'" In *H. G. Wells's Perennial Time Machine: Selected Essays from the Centenary Conference 'The Time Machine: Past, Present, and Future' Imperial College, London July 26-29, 1995*. Edited by George Slusser, Patrick Parrinder, and Daniele Chatelain. Athens: University of Georgia Press, 2001.
- Schaffer, Simon. "Astronomers Mark Time: Discipline and the Personal Equation." *Science in Context* 2, no. 1 (1988): 115-145.
- Shaw, Jenny. "Punctuality and the Everyday Ethics of Time: Some evidence from the Mass Observation Archive." *Time and Society* 3, no. 1 (1994): 79-97.
- Schivelbusch, Wolfgang. *The Railway Journey: The Industrialization of Time and Space in the 19th Century*. Berkeley: University of California Press, 1986.
- Simmons, Jack. *The Victorian Railway*. New York: Thames and Hudson, 1991.
- Smith, Merritt Roe and Leo Marx, eds. *Does Technology Drive History? The Dilemma of Technological Determinism*. Cambridge: MIT Press, 1994.
- Sobel, Dava. *Longitude: The Story of a Lone Genius who Solved the Greatest Scientific Problem of his Time*. New York: Penguin, 1995.
- Spicker, Stuart F. "Shadworth Hodgson's Reduction as an Anticipation of Husserl's Phenomenological Psychology." *Journal of the British Society for Phenomenology* 1, no. 2 (1972): 57-73
- Standage, Tom. *The Victorian Internet: The Remarkable Story of the Telegraph and the Nineteenth Century's On-line Pioneers*. New York: Walker & Company, 1998.
- Stanley, Thomas W. "Keeping Philosophy in Mind: Shadworth H. Hodgson's Articulation of the Boundaries of Philosophy and Science." *Journal of the History of Ideas* 70, no. 2 (2009): 289-315.
- Stephens, Carlene. "The Most Reliable Time: William Bond, the New England Railroads, and Time Awareness in 19th-Century America." In *Technology and Culture* 30, no. 1 (1989): 1-24.

- Sweet, William. "Rediscovering Bosanquet." In *Bernard Bosanquet and the Legacy of British Idealism*. Edited by William Sweet. Toronto: University of Toronto Press, 2007.
- Thompson, E.P. "Time, Work-Discipline, and Industrial Capitalism." *Past and Present* 38, no. 1 (1967): 56-97.
- Thrift, Nigel. "The Diffusion of Greenwich Mean Time in Great Britain: An Essay on a Neglected Aspect of Social and Economic History." working paper 188, School of Geography, University of Leeds, Leeds, 1977.
- . "The Making of a Capitalist Time Consciousness." In *The Sociology of Time*. Edited by John Hassard. New York: St. Martin's Press, 1990: 105-129.
- Toulmin, Stephen and June Goodfield. *The Discovery of Time*. London: Penguin Books, 1967.
- Turner, Mark W. "Periodical Time in the Nineteenth Century." *Media History* 8, no. 2 (2002): 183-196.
- Valente, K. G. "'Who Will Explain the Explanation?': The Ambivalent Reception of Higher Dimensional Space in the British Spiritualist Press, 1875-1900." *Victorian Periodicals Review* 41, no. 2 (2008): 124-149.
- Waugh, Eric L. "Railroads and the Changing Face of Britain." *The Business History Review* 30, no. 3 (1956): 274-296.
- Whitrow, G. J. *Time in History: Views of Time from Prehistory to the Present Day*. New York: Oxford University Press, 1990.
- Zerubaval, Eviatar. *Hidden Rhythms: Schedules and Calendars in Social Life*. Chicago: The University of Chicago Press, 1981.
- . "The Standardization of Time: A Sociohistorical Perspective." *The American Journal of Sociology* 88, no. 1 (1982): 1-23.