
**British Railway
Topography and Politics
in
John Cooke Bourne's (1839)
*Drawings of the London and
Birmingham Railway***

Volume 1

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Thesis submitted for the degree of Master of Philosophy (MPhil)
History and Philosophy of Science

I, John van Laun, confirm that the work presented in this thesis is my own.

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2021

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Abstract

This thesis provides an interdisciplinary study of the 1839 book, *Drawings of the London and Birmingham Railway*, authored by John Cooke Bourne. Bourne's volume depicts, in rich detail, construction of that rail line, the first major railway to reach into London's metropolis. *Drawings* also is a landmark in tinted lithography.

The first chapter focuses on the project's origin and development. It places particular emphasis on influences exerted by John Britton, who transformed an artist's fascination with change into an opportunity to create an overt political argument. I locate Britton's motives squarely within a campaign to assimilate radical changes of industrialisation into the genteel English landscape (and into the lives of change-resistant landed gentry). I also compare Bourne with other artists in a small coterie attracted to the excavations between Camden Town and Euston, including Thomas Talbot Bury, Robert Biemmel Schnebbelie, and George Scharf. I also link Bourne with engravers and printers in his local community of work.

The second chapter follows Bourne as he produced a visual record along the Euston Extension, that part of the London and Birmingham Railway between Camden Town and the line's terminus in Euston Grove. Bourne had an unusual ability to capture fine engineering detail while working quickly on a site. This chapter considers to what extent accurate engineering information can be extracted from Bourne's surviving material. The conclusion is that he was a reliable and valuable source.

The third chapter considers Bourne's artistic work from the perspective of aesthetics. He was different from those around him. His work combines an eye for precision with an understanding of composition and admiration of human endeavour. By following, in fine detail, the progression of his visual works - from sketches to field campaigns to studio work to selection of materials and sale - I argue we can identify Britton's impact on Bourne as these two men worked towards the product that ultimately became *Drawings*. Bourne's published work combined the Picturesque and the industrial Sublime to produce, ultimately, a new railway genre in landscape art.

The final chapter follows the afterlife of *Drawings*. As a prestige publication, *Drawings* stood little chance of becoming a traveller's companion. Bourne faded as the century moved on. *Drawings*, and Bourne's other work, was revived in Britain after World War Two during the rise of industrial archaeology. Bourne's chief revivalist was Arthur Elton. This movement sought to revive appreciation of the country's industrial heritage, especially its record of innovation in civil and mechanical engineering. As wall-mounted works of art, Bourne's tinted lithographed inspired. But on closer inspection, his work added technical knowledge otherwise thought lost. Also in this chapter, I examine Bourne's later interest in photography, and I speculate on its possible value earlier in his career for transferring images in lithography.

This thesis includes extensive appendices that reassemble much of Bourne's artistic work as it relates to the London and Birmingham Railway: from sketches and notes to wash drawings to final tinted lithographs. Other appendices allow comparison with peer artists developing work using the same subject matter. These appendices will serve as aids for further scholarship and comparison.

Impact Statement

This thesis contributes to the pursuit of industrial archaeology by reconstructing engineering processes associated with the 1830s construction of the London and Birmingham Railway, especially the Euston Extension. This results from my painstaking collection and organisation of Bourne's artistic work and from revelations in my analysis. Detailed information from this thesis also will be of value to engineers and architects involved with restoration and management of rail's heritage assets.

There is an ongoing political debate in Britain about how best to balance heritage with progress. While I have been undertaking this research, Britain's HS2 project has been authorised, and construction vigorously pushed ahead. We've been here before: not only in the 1830s, when the London and Birmingham cut through the landscape, but also in the post-war decades when past and present suffered collisions that lead to both radical change and preservationist responses. In recent years, some English communities have struggled with these same debates, and we've witnessed similar efforts to construct visions of the landscape to suit quite different political ends.

If this thesis has any value for non-specialist audiences, it will be to bring perspective and comparison to those debates. I hope it can bring not only specific factual value. I also hope that by introducing discussions of aesthetics themes, such as the new railway genre, participants in those debates will alert to the work visual representations can add to the arguments presented by different sides.

By assembling so extensive a visual record, this thesis will assist curators, collectors, appraisers, and (sadly) auctioneers in their identification, dating, and evaluation of artefacts related to railway memorabilia from the London and Birmingham Railway company and to artistic material related to Bourne. One reason for creating so extensive a set of Appendices is to assemble the fine detail so important for such work.

Stone lithography exists as an artisanal trade today. I hope this thesis contributes momentum to the admiration of this craft. I also hope practitioners who have yet to encounter Bourne's work will discover some of his techniques and passions, and I hope these will help them further master the craft. In addition to technical skills, Bourne brought to this trade a specific visual aesthetic. Artists working today will find in Bourne, perhaps, someone either to inspire or critique.

Note to Readers

This thesis has required many illustrations, not only those by John Cooke Bourne, but those by contemporary artists working on the same subject matter. Many of these are presented for the first time collectively in the Appendices alongside the Tables related to the publication of Bourne's tinted lithographs.

Where illustrations are referred to in the body text, they are numbered by the chapter in which they appear. For example, those first appearing in Chapter 1 are prefixed as Fig. 1.1, 1.2, etc.

For brevity where the full title of Bourne's *Drawings of the London and Birmingham Railway* is intended, this has generally been shortened to *Drawings*.

Where Bourne's wash drawings are illustrated I have abbreviated this to NRM (National Railway Museum) followed by the accession number.

Acknowledgements

First, to Professor Joe Cain go my grateful thanks for his generous supervision and encouragement in a topic for which he saw the potential. Second to Barbara Barnett, my partner, whose encouragement, and tolerance, saw me through a project when I might have thrown in the towel. John Liffen, of the Science Museum, drew my attention to sources which led to my publication in the *Journal of the Railway and Canal Historical Society*.

Sophie Brothers of the Science and Society Picture Library helped considerable with sourcing Bourne's wash drawings. Ed Bartholomew of the National Railway Museum made much material available. Matt Thompson and the staff at Ironbridge Gorge Museum Trust gave time and provided material from the Elton Collection, and Julia Elton offered advice. The staff at the National Archives Kew guided me to valuable material and the staff at NetworkRail provided microfilm copies of engineering drawings from the Drawing Office of Robert Stephenson. I have drawn freely on many articles for pictorial sources: such are those by John Vignoles and Martin Twyman which have done much to advance this study.

There are many that offered informal advice including Ian Clarke who was around as this study was in its embryonic form and suffered my ponderings when on fieldwork.

I am also grateful to the archives that provided material and advice. These include Camden Railway History Trust (Peter Darley) and Camden Local Studies and Archives Centre. Among these I must pay tribute to George Ottley's seminal works on the biography of *British Railway History* (1983, 1988 and 1998) which pointed me towards a number of sources.

In the initial stages of research, I was greatly helped by the website sponsored by Tring Local History (Ian Petticrew January 1914) entitled 'The Train Now Departing – Notes and extracts on the history on the London and Birmingham Railway'.

Introduction

This thesis presents a multi-perspective study of the book, *Drawings of the London and Birmingham Railway*, published in London in 1839. John Cooke Bourne (1814-1896) was identified as its author, having created roughly three dozen lithographs that are the *raison d'être* for the work. John Britton (1771-1857) contributed a “historical and descriptive account” as supplemental text. The combination of their works created a topographical record of a landscape that has become historically and archaeologically significant.¹

Drawings contributed to one side of a political argument about the relationships between new technologies, social change, and political transformation. The topographic and political were interdependent. As Dickens wrote, the large swathe cut into the landscape during construction of the London and Birmingham Railway ‘trailed smoothly away, upon its mighty course of civilisation and improvement’.²

Drawings also contributed to the expansion of aesthetic in British landscape art by creating an alternative representation of railways. This had the effect of buffering the introduction of radical new industrial technologies into the landscape as well as stretching landscape aesthetic to absorb new visual priorities. The result saw a merging of the Picturesque with the industrial Sublime. A new railway genre.

This thesis is a study of Bourne’s impact as an artist. It also is a study of the creation of *Drawings* amongst Bourne’s many projects. Analysis in this thesis includes Bourne’s biography, his processes for creating images, and his processes for creating saleable products such as through lithography. Considerable research has been done to locate and combine archives for Bourne’s artistic work. To best identify the genre Bourne was developing, comparison is made to a loose coterie of other

1 Felicity Myrone, ‘British topography: ‘Our real national art form?’ (British Library, 2020).

2 Charles Dickens, *Dealings with the Firm of Dombey and Son: Wholesale, Retail and for Exportation* (Bradbury & Evans, London, 1848), Chapter 6.

artists similarly producing visual materials associated with the London and Birmingham Railway. How was Bourne similar? How was he different?

This thesis is not only a study of Bourne. It also flips the perspective to serve the purpose of industrial archaeology. What can be learned about processes in the engineering and construction of the London and Birmingham line from the record Bourne created? In short, the answer is: a great deal. Bourne's ability to create highly accurate, as well as compelling, images lead to his revival as part of the post-World War Two resurgence of interest to recover Britain's history of civil and mechanical engineering.

Overture

In some respects, the story for this thesis begins in 1830, with the opening of the Liverpool and Manchester Railway - after which 'nothing that came after was ever quite the same as anything gone before'.³ With the Liverpool and Manchester line, the railway became more of a public issue owing to the introduction of fare-paying passengers and the resulting changes in physical and social mobility. Even so, railways required land, and land remained the preserve of the gentry who, through Parliamentary control, were keen to preserve power and authority.

The passing of the Great Reform Act of 1832 coincided with the first London and Birmingham Railway Act. This licensed the construction to the new line and promised to transform the landscape of spaces more directly experienced by the landed gentry. The experiential impact to this new line reached an apogee at just the time Bourne and Britton 'discovered' the excavations near Euston.

Railways needed 'friends'. Landowners had to be appeased. This was especially true where land was required for building the line. Railway proponents had to win over opposition. One strategy was to work through a reputable publication that presented the railway in a format suitable for the taste and discourse of gentleman.

³ Sir Arthur Elton, 1963. Quoted in David Gwyn and Neil Cossons, 'Early Railways in England: Review and summary of recent research' (*Historic England, Research Report Series* no. 25-2017, 3.4).

Finding a format for such an ‘unpromising subject of a railway, with all its mechanical and commercial associations’ might appear an unlikely venture but the course of previous events made it possible. Such aesthetic theories, whilst still appealing to artists of traditional landscapes, also opened other possibilities such as the depiction of heavy industry, and the modification of the landscape to feed the population. It was also at this time that Parliament had authorised fifty-nine new railways, with over 1500 route miles and around £35 million in capital during the years 1836-37.

Perhaps because of the landed gentry pique, the time was ripe for an apologist statement on the advantages of the railway, by now under construction.

Robert Peel argued ‘Railways were more than facilitating the transport of merchandise,’ implied that railways had universal function. This coincided with Britton’s enthusiasm that following the Reform Act he produced a survey of the area where Bourne happened to be drawing for sheer pleasure aspects of the excavations being undertaken.

Such a background provided a suitable avenue for a collaboration between Britton and Bourne. Both had overlapping interests in the construction of the London and Birmingham Railway. Those interests converged when the Euston Extension began in the middle 1830s. (The Extension brought the line from its prior terminus in Camden Town into the metropolis with a new terminus at Euston Grove.) Britton was an enthusiast for Free Trade and promoter of new technologies as a sure route to progress. Bourne was captivated by the excavations for the Euston Extension, began drawing them out of sheer interest. Britton saw in Bourne an appealing device for promotion. Bourne saw in Britton an opportunity to expand and commercialize his work. Combined, Bourne became the interpreter of topography, while Britton made use of the topographic vision Bourne created.

The result was originally issued by subscription in four parts starting from September 1838 and published collectively as a single volume of over thirty tinted lithographs a year later and included Britton’s “Description”. That single volume was Bourne’s *Drawings* (1839).

The success of tinted lithography led to publication of Bourne’s *Great Western Railway* (1846) in a similar format at the height of the Railway Mania. Whilst equally

appealing it did not have the same political connotations. For Bourne, this second volume led indirectly to photographic experiments for recording engineering.

Though Bourne's folio became an item for prestigious libraries rather than working men's companionship, there is no reason to assume Bourne's *Drawings* ever lost their appeal. There is a clear post-World War Two revival of appreciation of Bourne's work; paradoxically, the timing coincides with the decline in the railways and the demolition of much industrial heritage. Bourne's revival lies in the resurgence of interest in the relics of past industry, including the infrastructure that maintained it. In this resurgence, the 'redundant' artisan took on a mantle which was similar to Samuel Smiles's *Lives of the Engineers*, in which he praised 'self-help'. The focus for this was the preservation of redundant factories and railways. By 1955, the movement consolidated into the discipline of industrial archaeology.

Post-war, Bourne found a passionate advocate in Arthur Elton, whose retrospective of 'British Railways' included Bourne and returned him to a spotlight. Soon afterwards, Francis Klingenders's *Art and the Industrial Revolution* was published. Elton's revision of Klingender further built Bourne's reputation.⁴

The destruction of the Euston Portico in 1962 brought a howl of protest from architectural historians and railway preservationists. Ironically, this intensified the spotlight on Bourne as his image of the Portico was the highlight of the facsimile edition of Bourne's *Drawings* published only the year before. Around much the same time, the rediscovered original wash drawings of the London and Birmingham Railway, on which the tinted lithographs were based, were finally assigned to the Science Museum. The history of Bourne's efforts became key elements in arguments over Britain's industrial heritage.

Thesis Plan

This thesis contains four substantive chapters plus several appendices. I have included a significant number of figures in this thesis. These are included as a

⁴ Francis Klingender, *Art and the Industrial Revolution*, revised and edited by Arthur Elton, 1968. First published as Francis D. Klingender, *Art and the Industrial Revolution* (Noel Carrington, London 1947).

separate volume for convenience in cross-referencing. The appendices also are located in volume 2.

In Chapter 1, I describe the political climate in which the Bourne and Britton collaboration developed. I place my emphasis on opposition to railways, then on Britton's responses to that opposition. I argue Britton's collaboration with Bourne was part of his political rebuttal, and this prestigious publication formed one part of his justification for the railway being an adjunct to Free Trade in the wake of the Great Reform Act of 1832. I argue Britton encouraged Bourne to use the fairly new medium of tinted lithography in a large format, familiar in style to other topographical books, deliberately to appeal to the very class opposed to the railway. To compliment Britton's political engagement, I discuss the process of lithography as Bourne knew it, and I provide some historical context for interpreting the preservation of Bourne material.

Chapter 2 presents a technical and archaeological account of building the railway, starting at Chalk Farm and extending to the edge of the city through the Euston Extension for the carriage of passengers. Bourne was an artist with an unusually eye for precise detail. As a consequence, my research for this thesis has allowed me the opportunity to expand my interest in industrial archaeology. By integrating Bourne's published and unpublished work with other sources, it is possible to create a highly plausible account of the railway's construction and early operation, including the journey undertaken by travellers and their transfer to the main line to Birmingham.

The Euston Extension of the London and Birmingham Railway project became a honeypot for artists. Bourne was one, but there were others, too. In Chapter 2, I also compare the work these different artists produced. I consider the impact of their artistic training and choice of different media. The detail of the building of the Hampstead Road Bridge proved an attractive draw and resulted in a considerable amount of graphic detail. A similar draw was the Primrose Hill Tunnel portal. I examine Bourne's place within this coterie of artists.

Curiously, Bourne was also attracted to largescale excavations along the line, leading to his production of much material, including several wash drawings. Bourne produced these works for pleasure. Their dystopian nature proved unsuitable for

publication. I use this seemingly minor turn of events to identify the entrance of Britton into the course of Bourne's work, arriving with an agenda of his own. Britton's agenda ultimately will set Bourne off on a year-long campaign to gather a portfolio of publishable material.

In Chapter 3, I examine layout and aesthetic considerations used in the production and selection of the *Drawings*. I argue railways can be adapted as a type of a palimpsest. A suitable genre was that which had evolved from eighteenth-century aesthetic theories such as the Picturesque and the Sublime.

Following Bourne's return from his sojourn along the railway's construction line, he embarked on a plan to produce and sell prints of his work. I have painstakingly reconstructed the sequence of Bourne's production of materials for sale. This began as a plan to produce four issues of a few prints each, but it grew into a plan to publish a prestigious, combined volume available for the opening of the railway. Britton was the instigator for the combined volume, and he wrote the accompanying commentary. Bourne produced the tinted lithographs.

Drawings of the London and Birmingham Railway was published in 1839. In Chapter 4, I examine several post-1839 elements of biography and heritage associated with its interpretation. Rather than focus on Bourne's sequel publication, *History and Description of the Great Western Railway* (1846), I follow Bourne as he drifted into photography. I suggest there are possible similarities between his interest in photography and his production of tinted lithographs by direct contact with the printing stone.

Second, Bourne enjoyed a revival after the World War Two, marked by facsimiles in the 1960s of Bourne's two railway works and wide discussion of his work. His revival, I argue, was intimately connected with a new enthusiasm for industrial archaeology and growing enthusiasm for recovering Britain's history of civil and mechanical engineering.

I conclude the thesis with some reflections of Bourne's long-term significance both as an artist and as an aide to industrial archaeology.

I have included a number of substantive appendices because I want this thesis to serve as a foundation for further comparative study of the small coterie of artists

working to depict the creation of the London and Birmingham Railway. In part, my hope simply is recovery. In part, too, my hope is comparative. I also use the different iterations of Bourne's visual work to trace both his movements and developments along the engineering works. Not only are these tasks original contributions to knowledge. They also reinforce the point that studies like mine rise far above the fray of complaints about crude antiquarianism. There is much to learn from projects such as mine. There remains much more to do.

Chapter 1: Politics and Media in Bourne's *Drawings*

1.1 Introduction

This first chapter examines one layer of motivations shaping production of Bourne's *Drawings*. Simply said, it relates to "political" issues. I focus on the relationship between Bourne and his collaborator, John Britton. I argue Bourne developed an artist's enthusiasm for recording the massive changes in progress with the building of the railway in north London. Bourne's enthusiasm was co-opted by Britton to create a tool for political argument following the passing of the Reform Act. Britton's target was the land-owning class and their resistance to industry, a privileged position opposed to anything that might undermine their interests. I argue Britton promoted Bourne's illustrations as a means for winning over the opposition of that class. In so doing, Britton facilitated the creation of a 'modern' genre to suit a changing topography around social and economic change. In Chapter 3, I will argue Britton exerted important influence on composition within, and selection of, Bourne's images in the products offered for sale.

Bourne used the comparatively new medium of tinted lithography, which had been restricted previously to landscapes. In Bourne's hands, it was applied to the railway and used to convey moods extending from the Picturesque to the Sublime. Bourne handled his printing end-to-end - from preliminary wash drawings to final product. Also in this chapter, I reconstruct the production processes Bourne used, and I reconstruct his publishing programme for the *Drawings*.

The reception of the new genre was favourable, received as examples of both art and engineering. The novelty of Bourne's lithography can be compared to other artists' interpretations of the London and Birmingham Railway. Some of these other artists likely worked alongside Bourne on site at excavations. To provide a context for Bourne and the artistic changes he introduced, I examine precedents in the genre of railway prints as well as these contemporaries. I also discuss the fate of

contemporary material as well as Bourne's original wash drawings and related engineering drawings.

1.2 Railways and a Climate for Change

The 1830s opened with the rumblings of political and topographical change heralded by the opening of the Liverpool and Manchester Railway in which steam haulage was vindicated and applied to the carriage of fare-paying passengers. It is thus that the beginning of the decade saw, with the first modern railway, one of those epochal moments 'which divide, precisely, the past from the future, the old from the new, the historic from the pre-historic, and of which nothing that came after was ever quite the same as anything gone before'.⁵

Such change was aided by the growth in capital that became available for investment: at a time of low inflation, and with its low interest rates: it was thus that railways offered a reasonable return. Investment was assisted by the lower costs of raw materials, and in particular wrought iron, the production of which had been steadily growing since the introduction of 'puddling' towards the end of the eighteenth century. As spinoffs from the Napoleonic Wars, there were improvements in iron sections in the 1820s. These gave stronger, lighter rails permitting heavier locomotives. This was particularly relevant following a report commissioned for the London and Birmingham Railway on the strength of rails.⁶ Experiments by such as Eaton Hodgkinson (1789-1861) pioneered the use of cast-iron sections in railway structures. In this way, the railway climate of the 1830s was pregnant with possibilities for expansion.⁷

Such conditions prompted the building of the London and Birmingham Railway. It was proposed at the start of the decade, followed by its survey of routes, the passage of authorising legislation through the Houses of Parliament, building, and

⁵ Elton, 1963 (Gwyn and Cossons).

⁶ Peter Barlow, *Second report addressed to the directors and proprietors of the London and Birmingham railway company* (London. B. Fellows 1835).

⁷ Eaton Hodgkinson, *Theoretical and experimental researches to ascertain the strength and best form of iron beams* (Manchester, 1832). B. R. Mitchell, 'The Coming of the Railway and United Kingdom Economic Growth', (*The Journal of Economic History*, Vol. 24, No. 3 (Sep. 1964), pp. 315-336.

initial opening in 1838. This was followed by its celebration in 1839 with publication of *Drawings of the London & Birmingham Railway* by John Cooke Bourne ...with an *historical and descriptive account* by John Britton.

There lies in this precis, the conflict between two socio-political groups at a time of political reform. One celebrated the railway as progress and improvement; the other censured it as disruptive of the *status quo* and cause of upheaval to urban and rural landscapes both physically and socially. The latter group consisted mainly of landed interests whose control lay through Parliament and its resistance to reform until the early 1830s.⁸

In 1832 the Reform Act passed, which also chimed with that of the first (of two) London and Birmingham Railway Acts. Though first, the Liverpool and Manchester Railway was set in a distant and already industrialised landscape. The London and Birmingham Railway played out as the first trunk line to enter the metropolis. The first Act was particularly concerned with the transport of goods to join the London docks, explaining its design for termination at Regent's Canal, for onward passage.⁹ However, the second Act permitted the carriage of fee-paying passengers directly into London itself.¹⁰

The distinction between goods and passengers was not trivial in the early decades of railway building. Carriage of passengers encouraged, some argued, social levelling. This linkage was an undercurrent in divisions between those who celebrated railways and those who censured them. It was picked up by that advocate of Free Trade, Sir Robert Peel. In a 1837 speech in Glasgow, made as the London and Birmingham Railway was nearing completion, Peel argued:

*the Railways are not merely facilitating the transport of merchandise;
... they are not merely shortening the duration of journeys...they are
creating new demands for knowledge; they are fertilising the*

⁸ Michael Freeman, *Railways and the Victorian Imagination* (Yale, New Haven and London, 1999) pp. 27 - 38 offers additional views.

⁹ 3 Gul IV Cap. xxxvi. [1833].

¹⁰ 5 & 6 GuI. IV. Cap. lvi. [1835]

*intellectual as well as the material waste; they are removing the impediment which obscurity, or remoteness, or poverty, may have heretofore opposed to the emerging of real merit.*¹¹

This would have rung a bell with Britton, no newcomer to railways, having spoken in favour of a railway between London and Bristol as early as 1833.¹² George Godwin followed this tack with 'an appeal to the public' to remove its objections and accept the advantages of rail transport for passengers. Writing at the time when the London and Birmingham Railway was nearing completion, Godwin prefixed his remarks by stating the social advantages:

*The result, then, of the universal communication which Railways must bring about, even in a moral and philosophical point of view, will be of the most admirable nature. Knowledge will be disseminated; the concentration of intellect and power, now only exhibited in the metropolis, will be spread abroad indefinitely, and the moral condition of our species be immeasurably advanced.*¹³

Godwin went on to specify direct material advantages to all sections of society, including industrialists, and by implication, the landowner.

If our views, then, be correct, Railways claim earnest support alike from the manufacturer and the agriculturist - the man of science, the man of capital, and the philanthropist; and would do so, if no other country in the world yet knew their advantages.

There is much in these which was echoed by John Britton's views in which he nailed his colours to the mast in favour of the Reform Act and the advantages that would be derived from it.

¹¹ Peel Banquet. *Speech of Sir R. Peel... at Glasgow, Jan. 13, 1837* (Constitutional Office. Argyle Street, Glasgow).

¹² John Britton, 'Lecture on the Road Ways of England. Read before the Literary and Philosophical Society of Bristol, Oct. 19, 1833. Gutch and Martin, Small-street' (*Arnold's Magazine of the Fine Arts, and Journal of Literature and Science.*, new series: volume. 3 (Nov. 1833-Apr. 1834).

¹³ George Godwin, *An appeal to the public, on the subject of railways* (London 1837), pp. 42-44.

*The Reform Bill and Free Trade have produced palpable changes in these places, and still greater may be reasonably anticipated from the present political and improved state of society. Having witnessed the demoralizing and besotted condition of some boroughs, at the end of the last century, when 'the Rights of Man' were scouted and ridiculed by some, but praised and courted by others, I cannot but hail with exultation and pride the changes that have come over the face of our glorious island.*¹⁴

Britton's interest in publicising the London and Birmingham Railway as a social and political instrument accompanying Free Trade would soon be supported by a 'new' form of topographical illustration in which the railway played a central role.

Supporters of the London and Birmingham Railway grasped the idea of passenger of travel with enthusiasm. The company, making its headquarters at Euston, proposed itself as part of a great highway. A Greek-revival *propylaea* acted both as gateway and triumphal arch, starting point for, as a contemporary wrote, 'the Grand Avenue ... between the Metropolis and the midland and northern parts of the Kingdom'.¹⁵ The Euston Portico might also be seen as proclaiming Greek democratic values standing for a newly enfranchised fare-paying middle class stimulating a mobile society and social mobility. The commitment to passengers enshrined in the second Act expressly forbade the delivery of 'any Merchandise, Cattle, or Goods of any Description, save and except Passengers Luggage and small Parcels'.¹⁶

1.3 Censure of the Railway

On the side of censure, the landed gentry and conservationists had reasonable cause for objections to the railway. The Reform Act brought about the loss of rural control. This combined to produce protectionism and pique with the result that the railway Acts had a rough ride through Parliament. However, they were eventually

¹⁴ See Britton's Descriptive Account and John Britton (T E Jones), *The auto-biography of John Britton, copiously illustrated*, (London, 1850), (in one volume), p.343.

¹⁵ *Herapath's Railway Journal*, Vol. 2. (1837), p. 191

¹⁶ 5 & 6 Gul. IV. Cap. lvi. CXIII.

placated by the railway agreeing, among other points, to 'alter the route of the proposed line, so as to interfere less with the parks and residences of the gentry'.¹⁷

However, apart from the issues over the preserves of the landed gentry and opposing commercial interests, concern for urban dystopia and rural disruption threw off another corollary which challenged the promise that railways brought. There was then a lobby which wished to maintain the Romanic nature of a pastoral landscape which the railway disturbed-one later objector was William Wordsworth.¹⁸ In Wordsworth's time those were met by the proprietors of the railway in question justifying the railway as intended 'to place the beauties of the Lake District within easier reach'.¹⁹ It was also important that Bourne's lithographs placated these objections by showing the railway as an attractive feature in harmony with the landscape. To some extent Bourne's lithographs acted as a graphic precursor to such tourism. One finds similar modern objections to those of Wordsworth in the present-day attitudes to HS2 - 'Camden Council remain strongly opposed to High Speed 2 due to the impact and blight'.²⁰

On this urban front Charles Dickens had railed retrospectively against the disruption caused by the building of the railway at Camden near where he was at school. There was then an antithesis between the emerging middle-class industrialist and the traditionalists-both landed gentry and romantics - who like Dickens saw the threat of the railway as 'trailing smoothly away, upon its mighty course of civilisation and improvement'.²¹

¹⁷ J. W. W. *The London and Birmingham railway guide, and Birmingham and London railway companion: containing a minute description of the railroad, and every object worthy of notice; an antiquarian and topographical account of the towns, villages, noblemen and gentlemen's seats, within ten miles of the railroad* (London: J. Wyld, 1838). p. viii.

¹⁸ 'On the Projected Kendal and Windermere Railway': a poem by William Wordsworth.

¹⁹ Letter of objection from William Wordsworth, *Morning Post*. October 16, 1844.

²⁰ London Borough of Camden, *We are Camden*, (2013).

²¹ Dickens *Dombey & Son* 1848

1.4 John Britton: An Advocate of Railways

Bourne's *Drawings* played an important role in shaping some people's visions of how a railway would join the landscape. This use originated in a strategy developed by John Britton. Pragnall writes that Britton 'saw a commercial possibility in a book which might also allay the fears of the anti-railway lobby [and that] He sent Bourne to draw the excavations for Watford Tunnel with the understanding that he, Britton, would write the text'.²²

Whilst for Britton the building of railways was a compliment to Free Trade, the opposition needed to be placated. It was to this purpose that Bourne was enlisted as an instrument supportive of Britton in producing illustrations of the railway 'some in their completed state, but most of them as they appeared in various stages of their formation'.²³ Furthermore 'Britton's career was now in decline, hastened by the economic crash of 1825, which had escalated from a series of speculative projects within the financial system and brought down many producers of finely produced illustrated volumes'.²⁴ Co-opting Bourne was an opportunity to alleviate such problems.

The broad formula that Britton had used as a co-author in the series entitled *The Beauties of England and Wales* [1801-1815] with its topographical, historical, and descriptions set the pattern adopted for the *Drawings*. These works included engravings by landscape artists such as Thomas Hearne, J. M. W. Turner, John Varley and Benjamin West. For Britton, topographical authorship was a visual exercise into which he brought a wide range of disciplines and which went well beyond the mere combination of natural and artificial physical features of an area.²⁵ In eighteenth-century aesthetic terms these varied, but were adapted to the era with

²² Hubert John Pragnell, *EARLY BRITISH RAILWAY TUNNELS, The implications for planners, landowners and passengers between 1830 and 1870* (Doctor of Philosophy, University of York Railway Studies, (October 2016), p. 166.

²³ Britton (Jones), p. 95.

²⁴ Stephen Daniels, "'No Continuing City': John Constable, John Britton and Views of Urban History" (*Tate Papers*, No. 33, 2020).

²⁵ Stephen Daniels, *Picturing Places, 'Transforming Topography'* (British Library).

elements of the Picturesque and Edmund Burke's Sublime.²⁶ There was also an undercurrent of the traditional elements of landscape painting which made up the 'emotional, moral and religious resonance found in locations'.²⁷

Although limited to a single subject one finds in Bourne's railway illustrations a commonality which dovetails with Britton's views that a topographer should be multi-disciplinary, being:

*familiar with the sciences; and acquainted, intimately, with history, agriculture, mineralogy, biography, and the belles lettres. His mind should be enlarged by commerce with the various branches of society, and his judgment endowed with those comprehensive powers which result from the study and comparison of the opinions of every age and of every nation. He should have a taste for the polite arts, and particularly for drawing, which induces new ideas, and quickens the perceptive faculties almost to the creation of a new sense. In short, every exercise by which the moral and physical capabilities of man are invigorated should be familiar to him.*²⁸

Such all-embracing views can be seen in Britton's publication of the interiors of Sir John Soane's house and galleries in 1827, which not only used a novel approach to illustration but also championed Soane himself as an innovator who 'ventured to quit the beaten track'.²⁹ In this work Britton suggests a combination in which 'works of art and of literature are indispensable; they are necessary monitors, companions, friends'.

²⁶ Edmund Burke, *A Philosophical Enquiry into the origin of our ideas of the Sublime and beautiful* (London 1757) 'SECT. VII: Of the SUBLIME. See also Klingender, (edited by Arthur Elton) (1968), Chapter 5 'The Sublime and Picturesque'.

²⁷ 'Constable, Gainsborough, Turner and the Making of Landscape' (Royal Academy 8 December 2012-17 February 2013).

²⁸ John Britton, *The beauties of Wiltshire: displayed in statistical, historical, & descriptive sketches, illustrated by views of the principal seats &c, with anecdotes of the arts* (London, 1801), pp. v1-viii. I am indebted to Stephen Daniels for this extract.

²⁹ John Britton, *The union of architecture, sculpture, and painting: exemplified by a series of illustrations, with descriptive accounts of the house and galleries of John Soane* (London, 1827).

Another factor indicating Britton's wide interests was his influence on Ecclesiology. Although not an Ecclesiologist in the sense of the study of church buildings and decoration, Britton was regarded by that body as 'one of our honorary members... his elaborately illustrated works were among the earliest of the causes'.³⁰ These illustrated works being the series on Cathedrals that did much to advance the cause of the Gothic. Its mention here is again to substantiate Britton's commitment to the combination of text and illustration as used in Bourne.³¹

A more direct response to topography in its narrow sense can be found in Britton's 'Topographical Survey of the Borough of St. Marylebone, as Incorporated & Defined by Act of Parliament 1832'.³² This was published in 1834 and updated in 1837. It included the Euston Extension of the London and Birmingham Railway. Bourne was at Camden from September to October 1836, and it seems likely that there was a direct encounter between these two men. This is confirmed by Britton's biographer, who appears to have had first-hand evidence of contact, writing 'Some beautiful drawings of this Railway [by Bourne] were submitted to Mr. Britton, who suggested the expediency of their being published'.³³

1.5 An Alliance Between Bourne and Britton

However, contemporaneously Bourne was generally seen to offer an approach which could 'grace the drawing-room table ... as well as pleasing to practical men'.³⁴ Not only does this indicate a wide appeal which embraced both those of an artistic

³⁰ *The Ecclesiologist* 1857, p. 70.

³¹ John Britton, *Cathedral Antiquities: Historical And Descriptive Accounts, With 311 Illustrations, of the Following English Cathedrals. Viz, Canterbury, York, Salisbury, Norwich, Oxford, Winchester, Lichfield, Hereford, Wells, Exeter, Worcester, Peterborough, Gloucester, And Bristol.* (London, 1836). John Britton, *Architectural Antiquities of Great Britain* (London 9 vols, 1805–1814).

³² See Stephen Daniels 'Mapping the metropolis in an age of reform: John Britton's London topography, 1820-1840' *Journal of Historical Geography*. 2017. Also, 'Topographical Survey of the Borough of St. Marylebone, as Incorporated & Defined by Act of Parliament 1832. J. Britton, 25 June 1834' (London. Published June 25, 1837).

³³ Britton (Jones), pp. 95 - 96 under 'LONDON AND BIRMINGHAM RAILWAY. Folio. 1838-92'.

³⁴ *The Gentleman's Magazine*, September 1839, p. 291.

leaning, but also those who sought accuracy in the depiction of civil engineering. For instance, the professional press noted the *Drawings* as ‘ a splendid specimen of railway art, and is a work which does credit to the artist, and communicates an interest to the railway’.³⁵ The Gentleman’s Magazine guardedly justified such an ‘ unpromising subject of a railway, with all its mechanical and commercial associations, ample scope is afforded to the artist for making effective and interesting pictures’.³⁶ And so the references in praise of engineering and art go on to state that ‘it is in fact a work which to the engineer is a splendid memorial of contemporaneous skill, while by the nobleman and the admirer of the fine arts, it deserves preservation as a unique specimen of art, and illustrative of one of the most striking enterprises of this wonder-working age.’

Whilst one can reasonably state that the idea of the publication of the *Drawings* was seized upon by Britton, judging from the enthusiasm by which they were received, it was Bourne’s images which clinched the matter. On the other hand Britton was moving with the times. He foresaw a developing Railway Mania and Britain as an accompaniment to a wonder-working age which would be the outcome of Free Trade in which the ‘new’ topography would be an instrument.

1.6 Railway Company Involvement

Britton’s ambitions obviously required the cooperation of the railway company. Although a topographical and descriptive account by Britton was promised in the first advertisement for the ‘Sketches’ (as they were then termed) in June 1838,³⁷ it was not until April 1839 that Britton got down to writing to Richard Creed, the secretary of the London Committee asking for support and assistance for the contents.³⁸ By then possibly only two drawings were left to be published (Table 2 (part 2)). Britton wrote:

³⁵ *The Civil Engineer and Architect’s Journal* (September 1839), p. 35 and 353.

³⁶ *Gentleman’s Magazine* 1838, p. 419.

³⁷ *Gentleman’s Magazine Advertiser* June 1838.

³⁸ Letter from J. Britton (17 Burton Street) to R. Creed Esq. 2 April 1839 (British Railways Board HL R/281/3) reference confirmed by Stephen Daniels.

I am now writing my descriptive account of your great undertaking and am not a little anxious to produce such an essay as may do justice to the work and all the parties concerned in it-may I beg the favour of you to furnish me with copies of your various printed reports & such other facts & explanations as may enable me to be correct in all my data & discriminating in the details.

However, Britton added some weight to his request which would have struck home following the opposition which the Parliamentary Bills had faced in their passage through the two Houses.

Fully aware that we have jealous & fastidious critics to deal with in, both the houses of parliament, & out of them, I wish to remove, or at least to check, the tide of prejudice against us, & display our powers, capabilities, & efforts.

Judging from the detailed content revealed in Britton's *Description*, it is clear that the information was forthcoming as also acknowledged in Britton's conclusion to the *Drawings*. However, this second part of his letter gives an indication that, although the railway had been opened the previous September, there were problems which possibly related to the projected Aylesbury Railway which was engineered by Robert Stephenson and leased to the London and Birmingham Railway after its opening in June 1839.

However, the clearest confirmation of the involvement of the railway company comes from the provenance of the wash drawings which can be traced back to 1839 which I discuss towards the end of this chapter in 'Conservation, ethics and preservation'.

1.7 Artistic and Technical Influences on Bourne

It is likely that news of the unprecedented works then underway on the Euston Extension at Camden quickly reached Bourne at home, at 19 Lambs Conduit Street. From there, he had easy and daily access to Camden. His first known sketch of the railway dates from August 1836. In modern terms Bourne might have been

considered a graphic artist.³⁹ As such, it is likely that he would have been aware of sporting and coaching prints (Fig. 1.13, mentioned below) as well as the images of railways becoming more common with the opening of the Liverpool and Manchester Railway.

Bourne was trained by John Pye (1782-1874), an engraver of some note.⁴⁰ Being related to another engraver George Cooke, he would have been kept well informed of developments and been aware of different media available for reproducing such images. Through working relationships with publishers such as Rudolph Ackermann, Bourne also would have been able to study the multitude of prints produced by caricaturists such as Thomas Rowlandson (1756-1827) and James Gillray (1756-1815).

In Bourne's working environment, there also were a number of key publications to examine. As well as Britton's 'Topographical Survey of the Borough of St. Marylebone' there were already such publications as Richard Horwood's plans of London and Westminster which showed every house (1792-9), and Richard Phillips's *Modern London* (1804).⁴¹ Together with Rudolph Ackermann's *Microcosm of London* (1808-10), these gave more of a social representation of London.⁴² One might have hoped that John Tallis's *London Street Views* (1838-40) would have given a more up-to-date picture of the Euston end of the railway but, despite house details elsewhere, the area is shown as vacant.

A host of topographical material might have influenced Bourne. It will suffice to suggest Bourne's move towards tinted lithography as the medium probably came through such publications as Rudolph Ackermann's *A Complete Course in*

³⁹ *Benezit Dictionary of British Graphic Artists and Illustrators* (Oxford University Press 2012), p. 154.

⁴⁰ *Dictionary of National Biography* (DNB).

⁴¹ [Phillips] *Richard Phillips's Modern London; being the history and present state of the British Metropolis* (London 1804).

⁴² Rudolph Ackermann. *The microcosm of London*. London : Published at R. Ackermann's Repository of Arts, 101 The Strand, 1808-10. See following Matthew Sangster, 'Transformation and Specialization in London and its Topography' *Journal of Victorian Culture*, 22(3), pp. 317-328. Richard Horwood's *PLAN of the Cities of LONDON and WESTMINSTER the Borough of SOUTHWARK, and PARTS adjoining Shewing every HOUSE* (1792-9). Richard Phillips's *Modern London* (1804).

Lithography (1819) and Charles Hullmandel's *The Art of Printing on Stone (1824)*. Regarding style, there is much in James Duffield Harding's *Sketches at Home and Abroad* published in 1836, just as Bourne was underway at Camden. The form and content of *Home and Abroad* was to bear fruit in the publication of the complete volume of Bourne's *Drawings*.

1.8 A Coterie of Artists Focusing on the New Railway

Bourne was not the only artist interested in the new railway. Such heavy excavations through the metropolis raised the possibility of rich artistic pickings. Topographical artists, including Thomas Talbot Bury (1809-77), George Scharf (1788-1860), and Robert Biemmel Schnebbelie (1781-1847) visited the Camden area at much the same time as Bourne. Add Samuel Charles Brees (1810-65) and Frederick Walter Simms (1803-1865), who produced images from engineering drawings.⁴³ Clearly, there developed a mixed coterie of artists and artistic approaches working around the new railway. Sadly, we do not have direct evidence for collaboration or interaction.

1.8.1 Brees and Simms Worked from Engineering Drawings

Two authors were most connected with the publication of the engineering details of the London and Birmingham Railway: S. C. Brees and F. W. Simms. In general, their published works appear to be directly based on Robert Stephenson's engineering drawings for the railway (Figs. 1.29, 1.30, 1.31, 1.32 and 2.48).

The first of the Stephenson plans and elevations were produced in a small cottage on land purchased by the Company near where the railroad passed under the Edgware Road. Quickly, this space proved too small. When the Eyre Arms Hotel (Fig. 1.7) became vacant, the Engineer's Drawing Office was moved into the hotel's Great Room. Twenty to thirty draughtsmen worked in this space. From here, original contract drawings were signed by the engineer-in-chief and the contractor. Signed drawings formed the basis of a legal agreement. For each drawing, three copies

⁴³ S. C. Brees, *Railway Practice. A Collection of Working Plans and Practical details of Construction* (London 1838). Frederick Walter Simms, *Public works of Great Britain...*, (John Weale, London 1838).

were made: one was for the use of the committee, one for the engineer-in-chief, and one for the assistant-engineer superintending the district in which the work was situated. The entire line, as far as contracts were concerned, was divided into thirty separate divisions, each requiring distinct drawings, estimates, and specifications.⁴⁴

Cordy argued the contract drawings were borrowed by Brunel and used by him as the best possible system of draughting and from 'that time they became recognised models for railway practice.'⁴⁵ It was in this manner that both Scharf and Simms probably gained access to the originals. Nevertheless, there are some on-the-spot sketches by Scharf made around the first terminus at Chalk Farm and Primrose Tunnel which, whilst adding information to those published by Brees and Simms, do not appear to have originated from Robert Stephenson's Drawing Office in 1838.⁴⁶

The written contracts - titled as 'Contract plans of bridges, tunnels, culverts, permanent way and other engineering works between Euston and Birmingham' - remain at The National Archives under RAIL 384 with the contract number added - 1B, 2B etc (Fig. 1.8). In general, it appears only written contracts survive. There are a few exceptions, such as for 'Weedon Viaduct,' which appears to be too long to have had commercial value.

In the late 1820s Samuel Charles Brees's was an engineer and accomplished artist (discussed in Chapter 2). He served an apprenticeship with the London architect Henry E. Kendall where Lewis Cubitt, a main contractor to the London and Birmingham Railway, spent some time. In 1830, Brees went on to train under G. W. Buck as an engineer. Buck was one of the more experienced engineers of the London and Birmingham Railway. For instance, he wrote a specialist book on the

⁴⁴ John Cordy Jeaffreson, *Life of Robert Stephenson with descriptive chapters on some of his most important professional works* (2d ed. London, 1866). Vol. 1, p.192 and 213.

⁴⁵ Jeaffreson, p.213.

⁴⁶ The written 'Contract plans of bridges, tunnels, culverts, permanent way and other engineering works between Euston and Birmingham' remain at the National Archives under RAIL 384 under the listings with the contract number - 1B, 2B etc-most plans and elevations appear to be missing.

skew bridge at Boxmoor.⁴⁷ Brees seems to have continued publishing and drawing whilst working for the London and Birmingham Railway.⁴⁸ Following the completion of the railway in 1838 he published *Railway Practice*, which became a standard work continuing to be republished and updated until 1847 (see Figs. 2.18, 2.24, 2.33).⁴⁹ After the first publication, he entered into a contract in 1841 with the New Zealand Company for a three-year appointment, but the company failed and he returned to England in 1845. He continued to produce further revised and modified editions of *Railway Practice*.

Whilst in New Zealand he produced the artistic material for which he is best known. The book on which these are based was published in England in 1847 as a portfolio of engravings entitled *Pictorial Illustrations of New Zealand*.

Frederic Walter Simms was a near contemporary of Brees. His father was a manufacturer of scientific instruments.⁵⁰ Simms trained as a surveyor, and through various appointments he eventually became a railway engineer and publicist. His appointment to the Trigonometrical Survey of Ireland apparently equipped him for a post as an assistant at the Royal Observatory in 1830. He stayed until 1835 when a former colleague in Ireland was appointed to a post he coveted.

In 1836, Simms joined the South Eastern Railway as a resident engineer and undertook a considerable number of works, including the construction of tunnels. These were the basis of his book on tunnelling published in 1844. In this, he likely gained some knowledge of tunnelling from his experience on the London and Birmingham Railway.⁵¹ In the meantime, he published his *Public Works of Great*

⁴⁷ George Watson Buck, *A Practical and Theoretical Essay on Oblique Bridges* (John Weale Architectural Library 1839).

⁴⁸ *Bridge over the Grand Junction Canal at Blisworth showing the state of the work as they appeared in September 1837* (source: Brees 1838) and Fig. 3.2. Also, *Construction of North Church Tunnel, Berkhamsted, on the London & Birmingham Railway*, drawn by S C Brees and engraved by A. Picken, 1837.

⁴⁹ [https://www/gracesguide.co.uk/Samuel Charles Brees](https://www/gracesguide.co.uk/SamuelCharlesBrees).

⁵⁰ *Dictionary of National Biography, 1885-1900*, Vol. 52 and *Institute of Civil Engineers, Minutes of the Proceedings* Vol. 25, Issue 1866, 01 January 1866, pp. 519–522.

⁵¹ Frederick Walter Simms. *Practical tunnelling: explaining in detail* (London 1844).

Britain - includes railways, canals, roads and a survey of the harbour and port of London, with John Weale in 1838. It is this work that has been used here as a source for illustrations.

Both Brees and Simms are examples of Victorian opportunists. They used existing talents to exploit situations in which they found themselves. Simms received the Telford Medal from the Institution of Civil Engineers in 1842, having been elected a graduate of the Institution and becoming a full member in 1841.

1.8.2 Bury was First to Publish London and Birmingham Railway Illustrations

The first of our artists to publish on the London and Birmingham Railway was Thomas Talbot Bury (1809-77). He worked through the patronage of Ackermanns.⁵² Rudolph Ackermann's wide range of publications required employment of such artists as Thomas Rowlandson, Isaac Cruikshank and Augustus Charles Pugin.

Bury was one of Pugin's architectural pupils, and this gave him indirect contact with Ackermanns. Through this relationships, Bury was able to publish his *Six Coloured Views on the Liverpool and Manchester Railway* as a series of aquatints.⁵³ Following these railway views, Ackermanns published Bury's *Six Coloured views on the London and Birmingham Railroad* in 1837 (see Appendix 4).⁵⁴ Bury intended these six aquatints as just the first in a series from a 'lengthy list of railroad views as advertised on the back wrapper' (Fig. 1.6).⁵⁵ Those later aquatints did not materialise. The six already published later were omitted from a list of *Railroad Views &c. 'already published'*. Possibly this omission was due to a change in

⁵² For a general account of railway prints see Gareth Rees, *Early Railway Prints: British Railways from 1825 to 1850* (Phaidon, 1980).

⁵³ Thomas Talbot Bury, *Coloured Views on the Liverpool and Manchester Railway*, aquatints by S. G. Hughes and H. Pyall (London, R. Ackermann, 1831).

⁵⁴ Thomas Talbot Bury, *Six Coloured Views on the London and Birmingham Railway, from Drawings Made on the Line with the Sanction of the Company*, Part I 1837.

⁵⁵ British Art Center - Abbey copy folio 2009 35.

medium use. However, it seems possible that he intended to continue with a second part as with the Liverpool and Manchester publication.⁵⁶

1.8.3 Scharf Moved North Quickly

Even before the second Act had been obtained for the Euston Extension, George Johan Scharf was on the move northwards from his home in St Martin's Lane. He was attracted by the works in progress on the Primrose Hill Tunnel and works moving towards Chalk Farm Lane lying north of Regent's Canal.⁵⁷

Scharf had a varied and interesting life.⁵⁸ He was born in 1788 in Mainburg Bavaria. In 1804, he went to Munich where, like many German emigres, he learnt the techniques of lithography from Alois Senefelder. This was well before the publication of Senefelder's *Vollständiges Lehrbuch der Steindruckerey*. In 1801 Senefelder had been awarded British Patent no. 2518 'A New Method and Process of performing the Various Branches of the Art of Printing on Paper, Linen, Cotton, Woollen and other Articles.'⁵⁹ The technique was established in England by the time Scharf arrived in 1816. Whilst working around Europe, Scharf was employed producing miniature portraits, which demanded a meticulous approach he later used in scientific illustration, such as in commissions for Charles Darwin (Fig. 1.1).

Scharf's real love was as a chronicler of everyday life, in which he excelled in combining social realism with accurate detail as found in engineering.

⁵⁶ This was in Two Parts, with 'additional Plate of Carriages. Price, each part, 12s.; or the two parts, bound together, with a view of the Intersection Bridge, which crosses the Line near the foot of the Sutton Inclined Plane, and two long sheets of Trains of Carriages, &c., showing the different ways of conveyance. Price, complete, £2 2s'.

⁵⁷ *George Scharf-from Regency Street to Modern Metropolis* (Jerzy J Kierkuc-Bielinski - Soane Gallery and British Museum 2009). Peter Jackson, *George Scharf's London* (John Murray, London, 1987).

⁵⁸ George Johann Scharf (1788 - 1860), Royal Academy Collection: 'People and Organisations'. Alison O'Byrne, *The London Journal* (Vol. 37 No. 3, November 2012), pp. 149–51 Introduction: *London Scenes*.

⁵⁹ I am indebted to Michael Twyman for this account (Michael Twyman, *Lithography, 1800-1850: The Techniques of Drawing on Stone in England and France and Their Application to Works of Typography* (Oxford University Press (1970), pp. 26-27 and 257).

In Scharf's 'Moving a cast-iron girder' (Figs. 1.2 and 1.3) one sees the combination of accuracy with human endeavour which is apparent in his drawings of the placement of the iron girders at Hampstead Road Bridge (Figs. 2.82 to 2.85). Scharf's better-known 'Laying a water main in the Tottenham Court Road' (Fig. 1.4) shows accurate detail of the actual operation with the melting of lead for sealing joints and gauging for accuracy with joints between cast-iron pipes. Both these were produced at the time of Scharf's interest in the action at Chalk Farm Lane and Primrose Hill Tunnel which are similar (Appendix 5). Furthermore, this aspect anticipates paintings of the 1860s such as Ford Madox Brown's 'Work' and William Powell Frith's 'The Railway Station'.⁶⁰

Scharf's combination of social realism and engineering seem to have influenced Bourne's earlier *flaneur*-type works on the Euston Extension and the studies he absorbed into them (see Appendix 2).

1.8.4 *Schnebbelie Creates an Alternative Vision*

Another artist with an interest in the London and Birmingham Railway with a view to publication of a different kind was Robert Blemmell Schnebbelie (1781-1847), who started illustrating in 1803, mainly of buildings around London. In this, he followed his father, Jacob. His interest in railway illustration first appears with his rendering of *A view of the London and Greenwich Railway, Bermondsey*, one of the earliest known images of passengers arriving at a London rail station (Fig.1.5). The scene shows Spa Road in 1836, which remained a temporary terminus until London Bridge Station was opened in December 1836.⁶¹

Schnebbelie moved on to the London and Birmingham Railway, possibly a little before Scharf and Bourne became occupied on the Euston Extension at Hampstead Road Bridge, as shown by his skeletal drawing (Fig. 2.65). Schnebbelie then produced around eighteen watercolours of the London and Birmingham Railway

⁶⁰ On Scharf's comparison with Ford Maddox Brown's 'Work' see Richard Altick 'Street Wise' (*London Review of Books* Vol. 9, No. 19 (29 October 1987)).

⁶¹ It was G. F. Bragg's coloured lithographs of this railway that were adopted by Ackermann for publication in 1835.

(Appendix 3), nearly all of which were related to the railway built under the first Act. Nothing saleable came of his efforts, and he was forced, through poverty, to sell them for £2. 17s. 0s.

Why Schnebbelie's ambitions collapsed is not known. It seems likely that it was Bourne's enterprise, which was being advertised in October 1838, that stymied his ambitions. The eighteen images of the London and Birmingham Railway, sixteen of which are watercolours in the Constable tradition, can be sourced to Ambrose Hill (1847-1913), which on his death in 1913 were bequeathed to St. Pancras Library from where they passed to the Camden Archives (Appendix 3).

1.9 From Sporting Prints to Railway Topography

The topographical nature of the triumph of the railway was not missed by publishers such as Ackermanns, who grabbed it as being a novel subject for their portfolio.⁶² Many of these early works of railways show precursors in sporting and coaching prints, with a fair number coming out of the Ackermann publishing house.

For instance, Fig. 1.12 (top) shows first- and second-class coaches similar to road coaches. However, the early illustrations of the London and Birmingham Railway show an influence towards civil engineering as the main achievement. This confirms my thesis that the courting of fare-paying passengers was the great railway success by making them participants in the great adventure. Even before the opening of the Liverpool and Manchester Railway there had been a developing railway genre that showed fare-paying passengers involved in a journey, as if the image stood in proxy for the experience (e.g., Fig.1.10). Of course, passenger travel, as we now understand it, would not have been feasible without locomotives. This point is made through the poster for the Rainhill Trials (Fig. 1.11) and shown with passengers (Fig. 1.12).

Whilst Fig. 1.12 introduces the combination of locomotive with all categories of passengers, including a horse-drawn coach, its setting is barely topographical. In a similar way the doyen of sporting and coaching illustrations - James Pollard (1792-1867) - in attempting to keep up-to-date and maintain the Romance of the road

⁶² See Rees (1980) for a wide spread of railway illustrations by Ackermann.

coach grafted it onto rail travel (Fig.1.13). To some extent his mixture of harnessed horses being ridden to link up with the coach made the transition to the railway more acceptable.

Although the railway had many of the attributes associated with coaching, Bourne avoided these connections. The underlying factor is the romance of the journey which was, as we shall see, promised in the organisation at Euston from its imposing entrance Doric Portico to the boarding of the train itself (Figs. 2.102 *et seq*). More than anything this is apparent in the mixture of personalities at Paddington revealed in William Powell Frith's 'The Railway Station' of 1862.

In Fig. 1.14 one departs from the focus on the method of travel to showing a diminished train in a topographical setting which has now assumed the prime position of having triumphed over Chat Moss, one of the most difficult of engineering features on the Liverpool and Manchester Railway. As if in contrast the Moorish Arch (Fig.1.15) stands imperiously in command of foreign trade at the port of Liverpool.

Walker captures the view and how George Stephenson triumphed over it in which he compares the railway to Britain's conquest of the seas. 'On first entering upon this heathy ocean, the prospect is somewhat bleak and cheerless, but towards the crown of the moss it becomes varied and extensive. The travelling engines may be seen two miles either way, and the distant country forms a pleasing panorama'.⁶³

In some respects, this sets the scene for Britton's type of account. Fig. 1.16 takes us further with a truly good example of the terrain which had to be overcome between Hetton Colliery and the staithes on the River Wear. In this early example we find in a collaboration between J. D. Harding and Charles Hullmandel, both of whom were to play an important part in influencing Bourne's use of tinted lithography. Figs. 1.17, 1.18 and 1.19 show Hetton Colliery, possibly at the time of its opening in 1822.⁶⁴ Fig. 1.17 appears to be a pencil sketch which was lithographed (Fig. 1.18) with Fig.

⁶³ James Scott Walker, *An Accurate description of the Liverpool and Manchester Railway* (Liverpool, 1831), pp. 35 and 36.

⁶⁴ At the opening on 18 November 1822 crowds of people came to see the locomotives pulling 17 loaded wagons, averaging 64 tons, at 4 miles an hour. Also, Science and Society 10420898, Ironbridge Gorge Museum AE185

1.19 possibly showing the three locomotives - 'Dart', 'Tallyho', and 'Star' named after local racehorses.

This real event was much in the spirit that Bourne would show around fifteen years later. Whilst not as accurate as an engineering drawing, enough is shown for comparison to be made with Nicholas Wood's technical drawing of a similar locomotive (Fig. 1.20). As Wood was the manager of the colliery we can be assured of accuracy.⁶⁵

In some respect this use of lithography for railways was carried forward by Hullmandel for the first truly topographical scenes and made of the Canterbury and Whitstable Railway (Fig. 1.21) which was opened a few months before the Liverpool and Manchester Railway.

1.10 Towards Tinted Lithography

I now turn to the matter of the adoption of tinted lithography as a medium by Bourne. The process of tinted lithography involved two (or sometimes more) stones-the tint stone and the black stone. The former carried the background colour (in this case of a bluish tinge) whilst the black stone carried the image.

However, the process has a pre-history which originates with Ackermanns and soon to join forces as a joint publisher with Bourne. However, the founder, Rudolph Ackermann (1764-1834), died before Bourne even came upon the scene, but he played a particularly significant role in the introduction of lithography to England.⁶⁶

In 1796 Rudolph moved to 101 The Strand (Fig. 1.22) from where he published the *Microcosm of London*; which appeared in monthly parts between 1808 and 1810 and was illustrated in aquatint. For the *Microcosm* two colours were used - brown and blue - to which other colours could be applied by outworkers. This two-colour method therefore had something in common with the printing of tinted lithography-that is two stones-tint and black.

⁶⁵ Nicholas Wood, *A Practical Treatise on Rail-roads and Interior Communication in General*, (London: Knight & Lacey, 1825

⁶⁶ John Ford, *Rudolph Ackermann & the Regency World* (East Hoathly, Sussex, 2018).

Rudolph's interest in lithography was encouraged by his continued concern for his native Germany. In 1818 he visited Alois Senefelder (1771-34), the inventor of lithography, in Munich accompanied by Charles Joseph Hullmandel (1789-1850) who, as we have seen, was later to print some of Bourne's tinted lithographs. In 1819 Ackermann published a translation of Senefelders's *Vollständiges Lehrbuch der Steindruckerey as A Complete Course in Lithography* which had been published the previous year (Fig. 1.23).⁶⁷

Not only did Ackermann publish the *Complete Course* but also possibly made, under Hullmandel's influence, a step towards tinted lithography. This hypothesis can be guessed at by a copy of Senefelder's portrait by Lorenzo Quaglio included in Ackermann's translation and made by John Gendall (1790-1865) who used a tint plate to highlight the white and gradations of brown.⁶⁸ This anticipated James Duffield Harding's (1798 - 1863) medium of tinted lithography with whom I shall show there is likely to have been, at the least some influence on Bourne: Harding spent a short time apprenticed to Charles Pye, the brother of John under whom Bourne trained. In 1824 Ackermann took a further step towards lithography by publishing Charles Hullmandel's, *The Art of Printing on Stone*. However, the upturn for the success of the tinted lithograph can be traced though a scrapbook kept by Charles Hullmandel from 1818-41. From this it is fair to presume that the joint experiments made by Hullmandel and Harding in 1835 were the catalyst for the future development of the tinted lithography.⁶⁹ The following year Harding published his sketches at *Home and Abroad*.⁷⁰ Apart from the obvious connections this would have been known to

⁶⁷ *A complete course of lithography: containing clear and explicit instructions in all the different branches and manners of that art: accompanied by illustrative specimens of drawings. To which is prefixed a history of lithography, from its origin to the present time. By Alois Senefelder. With a preface by Frederic von Schlichtegroll. Translated from the original German, by A. S. [Senefelder, Alois, 1771-1834] (London, R. Ackermann, 1819).*

⁶⁸ John Gendall (1790 – 1865) worked for Ackermann from 1811 mainly in aquatint. Moved to tinted lithography at Ackermann's suggestion for the frontispiece of *A complete course of lithography* (DNB (L. H. Cust)

⁶⁹ For this account I owe much to Michael Twyman, 'The Tinted Lithograph' *Journal of the Printing Historical Society*, No. 1 (1965), pp.39-56. See also *Specimens of early lithography by Hullmandel and J. D. Harding* (St. Bride Library, Fleet Street London, 15582.

⁷⁰ James Duffield Harding, *Sketches at Home and Abroad* (London, 1836).

Bourne through such glowing accounts as appeared in *The Spectator* on 30 April 1836. Furthermore, the initial advertisement for Bourne's *Drawings* specifically mentions the 'style of execution with the splendid Publications of Harding, Roberts and Stanfield' (Fig. 1.27).

1.10.1 From Aquatint to Tinted Lithography

Rudolph had died in 1834 but two years beforehand he had handed over to his second son George together with his younger brothers who then traded as Ackermann & Co. at 106 The Strand. The print business had been previously established for his eldest son Rudolph at 191 Regent Street. One therefore suspects that, following Rudolph's abdication, a move away from the better-established aquatints towards lithography took place. For instance, Ackermann's tried their hand at lithographs with the 'Six Views of the London & Greenwich Railway' in 1836 which might have followed as the result of Rudolph's death two years previously (see *Railroad Views &c. 'already published'* (Fig. 1.6).

1.10.2 Tinted Lithography

The suitability of Bourne's wash drawings for lithography can be linked to his use of the *camera lucida* (Fig. 1.24). This produced an outline which, when partially filled with wash and highlighted through a liberal application of Chinese white, was particularly suitable for transfer to lithographic stone. In this he appears to be following Harding's painting techniques, who states that white should, 'on the foreground ...be so thick as to give relief from the paper, more especially on the small touches of light'.⁷¹ Harding also recommended that the white should be very much diluted in the skies. It was this sort of treatment that Bourne was able to transfer to his lithographs. Another factor was that Harding used tinted paper for his paintings which Bourne was able to emulate.

In glancing though Bourne's wash drawings and lithographs of the same subject, the reader may be struck by the faithfulness of the latter to the former. One particular aspect of these are the white areas recommended by Harding in painting.

⁷¹ J. D. Harding, *Elementary Art* (London, 1838), p. 78 quoted in Twyman (1965), p. 48.

Hullmandel, in association with Harding, was able to produce these as 'lights'. These were not achieved by direct printing in white impasto but by scraping or etching away areas of the surface of the tint stone. In this way patches were left unprinted. For skies it is clear that Harding's dictates were followed by Bourne in producing a softer effect: however, to obtain a deep white the surface was removed by Bourne in Harding's manner creating a hollow. Under pressure in printing this became embossed in the paper which, being very thick, remained undamaged on the under surface. As I shall later show the layout of the London and Birmingham Railway appears to follow that of *Home and Abroad*.

The technique can be proved by examination of Bourne's lithographs. By running a finger over the surface, these proud areas are particularly noticeable in the foregrounds and 'more especially on the small touches of light'.⁷² In a sense a type of aerial perspective was achieved by reducing the depth of lights to convey the idea of distance.

But this removal of the surface was not limited to minor detail: in many lithographs it seems that there were adjustments made in both the black and tint stones to achieve a sort of balance between the two.

1.10.3 Lithographic Printing

With regard to printing one should not confuse this with publishing-the latter was more related to marketing. As the imprint states, Bourne played the major part with Ackermanns, but there were others such as those named in the initial advertisement One such was Weale, the well-known publisher of architectural and engineering books.⁷³

Lithographic printing was then the process carried out by specialists of which two were selected by Bourne: one of whom was Charles Hullmandel and the other Day and Haghe. William Day (1797-1843) had been printing lithographs nearly as long as Hullmandel. In 1831 Day formed a loose partnership with Louis Haghe (1806-1883)

⁷² Harding (1838), p. 48, Twyman (1965) shows an example in Plate 6.

⁷³ *Quarterly papers on engineering. Edited and published by John Weale* (London 1844-49).

to trade as Day and Haghe. They became the most prestigious of early Victorian lithographic printers: in 1838 they were appointed 'Lithographers to the Queen' at around the time when Bourne was producing his first lithographs.⁷⁴

Whilst the printing of lithographs was a specialism which required the handling of stones, the transferral of the image onto the stone itself was a matter for the artist. As we have seen this was accomplished by Bourne himself. This demanded the question of the transport of such bulky material to and from the studio.

One should not underestimate the part played by the printer. In the case of Hullmandel's involvement it seems likely that he owned the stones which were loaned to the artist. (Fig.1.26).⁷⁵ This would have been an easy matter for the transport of stones between Hullmandel's press in Great Marlborough Street (Fig. 1.25) and Bourne in Lambs Conduit Street. Furthermore, it was in the printing stage that such matters as the pairing away of the stone to obtain the 'lights' took place and the selection of suitable inks.

A further point to Bourne's claim to ownership of copyright is his inclusion in the imprint as 'Proprietor': this sounds like a statement under the Hogarth Act of 1735 confirming the claim to copyright or possibly the medium used. This might suggest that Bourne used a unique process in transferring the wash drawing onto stone. Certainly close examination of the wash drawings in the National Railway Museum shows wash drawings and wash drawing are of the same size as confirmed by the pin marks on the lithographs. As well as matching the outside limits of the wash drawing it maintained the register between the application of the black and tint stones.

As we have seen much progress in printing was dependant on empirical knowledge gained from others. In this Bourne was by no means alone. He was trained as an engraver, but his contact with Edward William Cooke and, more especially the latter's uncle William Bernard Cooke (1778–1855), may have introduced him to mezzotints. William Bernard Cooke produced works for Turner. The effect of

⁷⁴ Michael Twyman, *A Directory of London Lithographic Printers 1800-1850* (London 1976), pp.29-30.

⁷⁵ Michael Twyman, 'Charles Hullmandel's stones at Kingston Lacy' (*Journal of the Printing Historical Society* (28). (2017), pp. 23-74.

mezzotint and soft-ground etching may have influenced Bourne in his adoption of tinted lithography. Pye's influence may have brought Bourne into contact with the effect of chiaroscuro for which he was well known and this effect can be detected in Bourne's tinted lithographs.

So far we have touched on those who were involved with the production aspect of lithography such as Ackermann and Hullmandel both of whom stem from contact with Senefelder.

1.10.4 Production

As we shall explore in Chapter 3 Bourne's perambulations along the railway produced a portfolio of nearly sixty wash drawings made *en plein air* between 1836 and 1839 which recorded the railway under construction. It was from these that a selection was made to be transferred by Bourne himself into tinted lithographs. In this way veracity was assured forming an 'archaeological' record of the construction of one of the earliest trunk lines 'best calculated to preserve the spirit and character of the originals, without reducing them in size.'⁷⁶ From these periodic publication was made by subscription from September 1838 (Fig.1.28) which were ultimately published collectively as a single volume a year later which included Britton's *Description*.

As we have seen the prestigious publication had wide appeal to both the gentry and the engineering profession. In this Britton played a major part lauding it by stating that it contained 'matters of great novelty and absorbing interest to the inhabitants of the metropolis'.⁷⁷ This might account for why the testimonial copy survives at Ironbridge Gorge Museum which is signed by Baron Wharncliffe, the Duke of Grafton, Buccleugh and Sutherland and such industrial tyros as Robert Stephenson, Philip Hardwick Joseph Bramah and the two Secretaries of the Company with some thirty others.⁷⁸

⁷⁶ Britton (Jones) p. 96).

⁷⁷ Britton (Jones) p. 97.

⁷⁸ Ironbridge Gorge Museum Trust 1839 AE 185.6/707.

The complete copies were published in September 1839 at £4-14-6d (4½ guineas) in half Morocco. The varied subscription list confirms that such a publication adequately confirms that it was fit to ‘grace the drawing-room table ... as well as pleasing to practical men’.⁷⁹ In the light of this it is not surprising that the Royal Academy of Arts purchased a copy in January 1840.⁸⁰ One can suggest some affinity with those publications made by the Society of Dilettanti in the eighteenth century.⁸¹ Here however not devoted to classical archaeology but to that of the everyday archaeological presence of the railway. Nevertheless, the presentation has similarities.

1.11 Conservation and Preservation

In this section, I explore the provenance and fate of Bourne’s London and Birmingham Railway primary material produced between 1836 to 1839. This material includes the wash drawings on which the tinted lithographs are based (National Railway Museum), studies by Bourne (Ironbridge Gorge Museum Trust), engineering drawings from Robert Stephenson’s Drawing Office (Network Rail copy photographs, Victoria & Albert Museum and Camden Archives) and material in National Archives RAIL 384.

Bound copies of the tinted lithographs, and sets of the four issues of eight pages published separately, are extremely rare now. It appears many were broken up and individual prints sold as separates. One such case occurred as far back as 1956

⁷⁹ *The Gentleman’s Magazine* September 1839, p. 291.

⁸⁰ Royal Academy 06/3132. 18 January 1840: ‘Resolved that Bourne’s Work on the Birmingham Railway at £4.4.0 and Britton’s Architectural Dictionary at 2 G. be purchased for the Library.’ (RA Council Minutes, IX, 92). Cf. RA Accounts, Quarterly Abstract of Bills, Xmas 1839 to Lady Day 1840: ‘Paid J. Britton for Books £6.2.0.’ Possibly after discount. The text printer is named in the colophon: ‘London: Printed By Moyes And Barclay, Castle Street, Leicester Square.’ The front paste-down carries the binder’s ticket, reading, ‘Bound By Burn And Son 35, Hatton Garden.’ Also, 20th-century half green morocco, 19th-century red straight-grained cloth, upper cover lettered with decorated frame, ‘Bourne’s Drawings of The London & Birmingham Railway With History & Description By Britton’; green morocco spine-label lettered ‘Bourne’s London & Birmingham. Railway’.

⁸¹ For a review of the Dilettanti activities regarding the propagation of Greek architecture see Dora Weibenson, *Sources of Greek Revival Architecture* (A Zwemmer Ltd., London. 1969), pp. 36 -47.

when the antiquarian print seller Frank Sabin offered Bourne's London and Birmingham Railway tinted lithographs individually priced from 3 to 6 guineas (£3.15 to £6.30). Most of these can be ascribed to a broken edition of the original which were coloured, whereby their individual integrity was lost.⁸²

1.11.1 Provenance of Bourne's Materials Until 1947

Stewardship over materials associated with Bourne's work has a complex history. In part, this is a history of institutional evolution. More important, it is a history of evolving classifications of his material as useful for current engineering needs versus obsolete and therefore only of historical or artistic interest.

The placement of the *Engineering Drawings from Robert Stephenson's Drawing Office* above raises the matter of how such survivors should be judged and how archived. This broadly revolves around the interpreted use as an engineering record or of aesthetic value. This narrows down to the historic material inherited by British Rail including the wash drawings:⁸³ this can be extended to the Elton Collection which was the repository for preliminary sketches.⁸⁴

The wash drawings are the source directly related to Bourne's *Drawings* as published and are now in the custody of the National Railway Museum. One may then query how they got there-in other words what is their provenance and what is the motive for placing them there?

The period from 1839 until around 1947 is unclear, but it appears that they were kept at Wolverton Carriage and Wagon Works having been placed there in the days of the London and Birmingham Railway following John Britton's soliciting for support from the railway company. And here they remained with the London and North Western Railway at Wolverton after amalgamation in 1845.⁸⁵ This is hinted at by

⁸² Frank T.Sabin, *Early Railways, Catalogue of an Exhibition* (London 1956).

⁸³ National Railway Museum-pictorial collection (railway). 1990-7189 to 1990 – 7255.

⁸⁴ House of Commons (HC Deb 18 July 1978 vol 954 cc460-70b).

⁸⁵ Held in the Drawing Office and collectively catalogued as WOL V/1 to 5 (87 drawing rolls, 14 large archive boxes, 2 large bundles, 1 wooden box containing glass slides, 309 standard

Elton's evidence that one of the Secretaries of the railway gave 'permission for specimens to be hung up before publication at the various stations along the line':⁸⁶ In other words they had been in the custody of the railway at some stage after their use had been fulfilled as the basis for translation into lithographs. One can surmise that the wash drawings continued to be at Wolverton Carriage and Wagon Works from where they were transferred to various sources until being eventually assigned to the National Railway Museum.

For this later period one gathers rather more detail from correspondence held by the National Archives.⁸⁷ In this one finds that the question of future custody arose as a result, of the proposed closure of Clapham Railway Transport Museum: this had been established in 1961 and moved to York under the Transport Act 1968 where it would come under the auspices of the Science Museum. At the time there were sixty two of Bourne's London & Birmingham wash drawings historically located at Euston or Wolverton with five at Clapham.⁸⁸ The issue of their placement revolved around their classification as either records or relics.⁸⁹ This debate had been instigated under the aegis of the British Transport Committee in July 1950, but the Kew correspondence relates to the period from 1971 to 1975 by which time serious consideration was being given to whether the total railway inheritance should be assigned to one of two groups - 'relics' or 'records':⁹⁰ if the latter they would remain

archive boxes) 'Records of Wolverton Carriage and Wagon Works A cataloguing project made possible by the Friends of the National Railway Museum'.

⁸⁶ Klingender, (Elton 1968) p. 136. See also National Archives BRB HL R/281/1) [RAIL/281/1?] 11 July 1838.

⁸⁷ National Archives AN111/598, Historical relics: custody of drawings by J C Bourne commissioned by London and Birmingham Railway in 1837 showing construction of railway, 1971 May 1 - 1975 Nov 30, 24-7-2A.

⁸⁸ The five from Clapham were - 1990-7231. 'Blisworth cutting, July 2nd, 1837', 1990-7232. 'Blisworth Cutting, from above. Construction just commenced. July 3rd 1837', 1990-7233 'Blisworth Cutting. Sept. 1838', 1990-7229. 'Wolverton Embankment Under Construction. Tipping in progress. June 29th, 1837', 1990-7230 Wolverton Viaduct. June 30th, 1837.

⁸⁹ For this debate see Mark Lambert, *The designation and display of British railway heritage in the post-war decades* PhD thesis, University of Nottingham (2017), p. 150 et seq.

⁹⁰ The involvement in this concerned the Consultative Panel for the Preservation of British Transport Relics from 1958.

with the British Railway Board (formed in 1963) or if the former they would be transferred to the Department of Education and Science-in effect the Science Museum (NRM). Broadly the classification revolved around whether a 'record' was an article of 'historical interest or value arising from the inscribed matter and not from the form of the article'. This included 'books, documents, manuscripts, plans and papers not required for administrative purposes'.⁹¹ Although it seems clear Bourne's wash drawings fell into the definition as 'relics' they could equally be considered as being in the category which embraced 'early timetables, rule books, tickets, and similar printed matter' and therefore a record of structural significance.⁹²

Whether 'relics' or 'records' the casual way in which the records of all types were treated lay behind the conundrum of assignment. The most likely reason is that the wash drawings were tidied away in the Drawing Office at Wolverton as the most suitable repository and that when cleared some had gone to Clapham.⁹³ As a result, alternative justifications for their placement were put forward based on their functional value. One was related to their PR value through their display in the Euston Board Room or the General Manager's Private Dining Room. Even the brochure that tried to justify the demolition of Euston Station in 1968 went so far as to 'include photographs of some of the valuable drawings by J C Bourne which hung in the entrance to the Euston Boardroom'.⁹⁴

At one stage, to satisfy both parties, it was proposed that they might be transferred to the DES and then loaned back to Euston on the basis that the latter would be responsible for their care: but that role appeared to be beyond the Board's resources. One glimpses the possibility that as a financial asset they were attractive to the Railway Board.

⁹¹ British Transport Commission, *The preservation of relics and records: report to the British Transport Commission* (London, 1951).

⁹² Lambert (2017), p. 152.

⁹³ National Archives ZLIB 15/42/4 *Transport treasures: booklet of exhibition of British Transport Commission relics* (1956).

⁹⁴ *The New Euston Station 1968* (British Railways (London Midland Region) 4 October 1968).

To Sir David Follett of the Science Museum they should be classified as 'relics' for which they were 'essentially exhibition material'. It was into this muddled debate that the legal minds decided that the wash drawings should be assigned to the NRM at York including the five at Clapham.⁹⁵

It is of interest that so much energy should be devoted to the assignment of these wash drawings. Such an apparently minor issue, in such a major piece of legislation, echoes the importance they have both as a record of engineering in the 1830s and, in spite of their engineering associations, were seen as works of art.

1.11.2 Records Invested in the Railway Board

Of the records invested in the Railway Board, drawings that emanated from Robert Stephenson's Drawing Office that are most pertinent to this study of Bourne's work. Following the various changes in ownership and titles these were transferred to Network Rail where they remain as an important working source as well as being of interest here.

Despite extensive searches, it is mainly only the parchment descriptions of the contracts which have been located and these are in the National Archives.⁹⁶ It appears likely that most of these were sold with a photographic record being made beforehand.⁹⁷ Some are appreciated as works of art and preserved at the Victoria & Albert Museum and Camden Archives. In general what is applied here comes from this photographic source. However, a few originals have been found which show the high standard of technical drawing of the times. It was these Stephenson drawings that were the basis for publication by Brees and Simms both of which provide a number of better images than the photographic record.

⁹⁵ Bourne wash drawings accession numbers - 1990-7189 to 1990-7255.

⁹⁶ National Archives RAIL 384/331 (Contract 4F Weedon Bridge no..235).

⁹⁷ For example, 'Design for a bridge at Wriothesley Street c1834. Pencil, pen and indian ink and watercolour. Museum number: E.651-1987 Prints & Drawings Study Room, level D, case KK, shelf 3. Office of Robert Stephenson. Scale 1/8 inch to 1 foot. Dimensions Height: 127 cm, Width: 69.9 cm'. <http://collections.vam.ac.uk/item/O44555/design-for-a-bridge-at-drawing-stephenson>. (Onslow's Auctioneers, Sale 22 September 1987 Lot 58. URL)

In the following examples, which I examine more closely in Chapter 3, I have shown two derived from the original Robert Stephenson Drawing Office copies which can be used to inform Bourne's wash drawings.

The first (Fig. 1. 29) uses Brees's redrawn Stephenson Drawing Office copy. The original is that now in the V & A but can be matched to a Bourne wash drawing (Fig. 1.30).

The second is a comparison between a Simms copy of a Stephenson Drawing Office copy and Bourne's tinted lithograph of George W. Buck's oblique bridge (Figs. 1.31 and 1.32).

1.12 Chapter Conclusion

When exploring Bourne's wash drawings one must appreciate the sense of discovery Bourne had in coming across the 'Great Excavations' which lay in reasonably close proximity to his home at Lambs Conduit Street. This inspired him to produce 'drawings ...intended as subjects of professional study'.⁹⁸ As we shall see he soon changed his style under the pressure of Britton and the appeal of a commercial return which would 'gratify both the lover of the Picturesque and the man of science: the former, by variety of lines and combinations; and the latter, by different modes of application of machinery, mechanism, and manual labour'.

The presumed chance meeting of Bourne and Britton on the Camden excavations might appear to have been ordained – one, the engraver; the other, a successful topographer. With some adjustments in style from Britton, Bourne adopted an approach which had more appeal to the target audience. In this Britton's objective was to win it over to the cause of Free Trade.

Although there were a number of artists with an interest in portraying the railway in general that of the London and Birmingham Railway was first published by Bury. In the case of Bourne and Britton the format, both in media and presentation, was intended to present railway construction as a landscape genre which would appeal to the landed gentry who were smarting under the effects of the Great Reform Act.

⁹⁸ *The Architectural Magazine*, Vol. 5 (London 1838-1839) pp. 610-11.

I have suggested direct cooperation with the railway company, which is substantiated by tracing the provenance of Bourne's wash drawings back to the company itself and the obvious access that Bourne had to the engineering drawings.

Chapter 2: Material and Technical Content in Bourne's *Drawings*

2.1 Introduction

In Chapter 1, I suggested the motives resulting in publication of Bourne's *Drawings* were political in key respects. I followed with a discussion of a coterie of artists attracted to the railway then under construction around Camden. I explored the different media available, Bourne's choice of tinted lithographs, and his production processes. I concluded with an investigation of their disposal and their provenance today.

Chapter 2 focuses on the material and technical content presented in Bourne's *Drawings*. First, I will concentrate attention on the area around Chalk Farm. It was here, in particular, that different artists and draughtsmen used a variety of media to record an evolving and unfamiliar topography around engineering. Other supporting contemporary sources (including illustrations, travelogues, engineering manuals, maps and literature) allow for deductions to be made supporting industrial archaeology and the history of technology of the period.

I argue Bourne was a master draughtsman and recorder who can be relied on to give an accurate archaeological period record of the construction of the first trunk line to reach London. Importantly, his recording method varies from other recorders, such as Scharf (who included measured detail). Bourne recordings lacked measured detail, though his depictions are archaeologically accurate.

This chapter proceeds topographically along the line of the Euston Extension, from Chalk Farm to the terminus at Euston. I begin with a brief historical sketch of activities leading to the authorizing legislation for both the original railway (Birmingham to Camden Town) and the extension (Camden Town to Euston Grove).

2.2 Delivering Passengers Directly Into the Metropolis

By 1830 urban development in London was particularly obvious north of the New Road (now Euston Road) where St Mary (New Church) and St Pancras (New Church) were already built.⁹⁹ It was along the City Road and New Road that George Shillibeer (1797-1866) ran his omnibus from Paddington past Euston Square into the City from 1829. In doing so, he brought the northern suburbs closer into the city centre.¹⁰⁰

In the early nineteenth century the Regent's Canal was built north of Regent's Park with a branch southward to Cumberland Basin setting off the developing area to the east from the Park as if by a moat. The distinction between the two areas can be seen in a watercolour by Robert Biemmel Schnebbelie (Fig. 2.41).¹⁰¹

Already in the area to the west-that is east of Regent's Park and south of the canal as far as the New Road - there were residential developments such as Mornington Crescent and dispersed developments along the Hampstead Road.¹⁰² To some extent the Regent's Canal was the northern limit from such development continuing calmly to its destination at Limehouse which, from 1820 was joined by a cut down to the river.

Up and down the City Road

In and out the Eagle

That's the way the money goes

*Pop! goes the weasel.*¹⁰³

⁹⁹ Here it formed and still does, a barrier to the metropolis - it is significant that no railway termini were built south of it (Joe Cain, *History of a London Street, Euston Grove* <https://profjoecain.net/euston-grove-london-wallis-guide-strangers/>).

¹⁰⁰ Morning Post 7 July 1829.

¹⁰¹ Chalk Farm Bridge and Camden Town Station (Camden Local Studies and Archives, Heal A XII 63 (Fig. 2.41).

¹⁰² See Mark McCarthy, *A Georgian suburb: revealing place and person in London's Camden Town* (*Masters thesis, University of London* 2018) for developments around Camden Town.

¹⁰³ I. Opie and P. Opie, *The Singing Game* (Oxford: Oxford University Press, 1985), pp. 216-18.

It seems likely that it was this encroachment that prompted George Cruikshank to satirise it with 'London Going out of Town, or the March of Bricks and Mortar' (Fig. 2.2).¹⁰⁴

With access to the Midlands and the growing railway system linking it to the Liverpool and Manchester Railway, the prospect of a railway to the canal in the vicinity of Chalk Farm Lane was welcomed by the canal company on the conditions that it terminated there and did not cross over it. If it did so, the canal company suspected that a railway might circumvent their own canal, including the Cumberland Basin with its access to the New Road giving a direct connection to the City for goods. However, the prospect of a railway in that direction limited to passengers was, as we shall see, a different matter.

The potential of fare-paying passengers had already been proved by the Liverpool and Manchester Railway, and this option was included under the first London and Birmingham Railway Act. Following on, a second Act was obtained in 1835, the Euston Extension Act contained the following clause.

*That it shall not be lawful for the said Company to receive at their intended Station in Euston Grove, for the Purpose of Transport, or to deliver out therefrom, any Merchandise, Cattle, or Goods of any Description, save and except Passengers, Luggage and small Parcels.*¹⁰⁵

The first sod of the London & Birmingham Railway, as authorised under the first Act, was cut at Chalk Farm Lane in June 1834. This gave the transportation of goods access to the Thames, via canal to Limehouse. For the first Act, work was contracted in May 1834 to Thomas Jackson and James Shedden as part of the 5½ miles to Brent, included Primrose Hill Tunnel.¹⁰⁶ For the second Act (made law in July 1835),

¹⁰⁴ 'Topographical Survey of the Borough of St. Marylebone, as Incorporated & Defined by Act of Parliament 1832. Published June 25, 1837; By J. Britton'.

¹⁰⁵ 5 & 6. IV. Cap. lvi. CVXIII

¹⁰⁶ National Archives RAIL 384 under 1B.

work for the Euston Extension was contracted to William and Lewis Cubitt in December 1835.¹⁰⁷

2.3 Beginnings at Chalk Farm

As discussed in Chapter 1, it was George Scharf -- always with his ear to the ground on London affairs -- who picked up on news of the approaching railway north of the canal.¹⁰⁸ Around the proposed terminus of the railway to be built under the first Act lay 'about 33 acres of [open] land, intended as a depôt for the buildings, engines, waggons, goods, and various accessories of the carrying department of the railway' (Figs. 2.3 and 2.4).¹⁰⁹ From 1834, Scharf made partial records of the deep approach cutting and the beginning of the construction work on Primrose Hill Tunnel. He also showed a particular interest in the permanent way.¹¹⁰ Having satisfied himself in making records of the area being built under the first Act, he moved south of the canal to record aspects of the Euston Extension. He focused in particular on the building of Hampstead Road Bridge, where he joined up with Bourne and Schnebbelie.

Scharf's sketches of the London and Birmingham Railway are of a technical nature and influenced by his meticulous work with scientific drawings. However, they are done in a more rough and ready manner: this makes one suspect he may have intended to work these up for some purpose (Appendix 5 shows all his completed works on the London and Birmingham Railway).¹¹¹

¹⁰⁷ Chrimes, 2003, Table 5, p.601), National Archives 384/160, 384/154.

¹⁰⁸ *George Scharf-- from Regency Street to Modern Metropolis* (Jerzy J Kierkuc-Bielinski - Soane Gallery and British Museum 2009). Peter Jackson, *George Scharf's London: Sketches and Watercolours of a Changing City, 1820-50* (London, 1987).

¹⁰⁹ *Mechanics Magazine* 700 Jan 7, 1837.

¹¹⁰ British Museum, Department of Prints and Drawings - 1862. 0614.400, 0614. 407, 0614. 418 0614.418.

¹¹¹ For instance, he signs himself as 'G. Scharf del'.

2.4 Permanent Way

“Permanent way” is terminology used to describe the elements of railway lines, including rails, sleepers or ties, and fittings installed to carry the locomotives and carriages for the permanent operating system. Permanent way is contrasted with temporary track and infrastructure used during construction of the line.

It is fitting that permanent way should be the starting point for artistic study of a railway. This first grasped Scharf's attention. One can well imagine the interest that such strange configurations would have inspired in Scharf with his interest in engineering. Possibly, correspondence in *Mechanics Magazine* alerted him to proposals for varying the permanent way.¹¹² There was much debate on the most suitable type of track to be used. Aspects of this debate can be teased from Scharf (Fig. 2.5) which, in combination with snippets of Bourne, make a contribution to the history of permanent way. A glance through the engineering manuals of the day indicate the importance attached to its development as a major expense in railway construction.¹¹³

Scharf's explanation of Fig. 2.5 follows his sketch:

'Stone 2 Feet squares and from 6 Inches to a foot thick' - 'Plan of the iron Rail and fastenings'. 'Bearing surface 2 ¼ in, 3 feet lengths, 3 ½ inches deep on chair and 5 inches deep at centre of fish-belly rail. Fixed in chairs with 5-inch nails into stone block sleepers'.

In general, this explanation fits into the established understanding of the background to the adoption of rail types thus showing that, at this stage, the London and Birmingham Railway, whilst in the vanguard of permanent way development, still followed earlier practices.

Those earlier practices began with the 1820 patent to John Birkenshaw of Bedlington ironworks that allowed for the creation of the fish-bellied rail by the use of the eccentric roll. Having been first rolled for the Stockton & Darlington in 1822, the fish-

¹¹² *Mechanics Magazine* 7 November 1835 (639), pp. 98-99 ('Joplings Improved Railway Platforms [sleepers]').

¹¹³ £213,000 of total £2,500,000 for rails and chairs.

belly was economically more viable through a reduction in weight from 48¾ to 28lb/yd.¹¹⁴ As a result, the fish-belly dominated the industry for a decade until the 1830s, when parallel sections began to take over. These were used in a multitude of slightly different shapes and generically were referred to as T-rails.

Fish-belly rail was abandoned mainly due to a report commissioned by the Company in 1835 from Peter Barlow.¹¹⁵ It follows that Scharf's sketches were made at the fish-belly stage in 1834 when the London and Birmingham Railway had seemingly not progressed beyond multiple rails of 3 feet between supporting chairs up to a total of 15 feet - i.e., produced by Birkenshaw's eccentric roll. Where the ends met at 15 feet, a lap joint (Fig. 2.5 top) was used and pinned through the supporting chair. Such details of chairs equally conform to Stephenson's drawings (Fig. 2.6).¹¹⁶

In the decades since Trevithick's 'steam circus' ran at Euston Grove, railway locomotives and permanent way evolved together. This co-evolution was watched closely by engineers.¹¹⁷ For instance, James and John Watt made a journey into South Wales at the same time to research developments in permanent way. They made annotated sketches with measurements in much the same way as Scharf did later. However, their interest lay in deciding on the advantages of edge rails over the L-shaped tramplate.

'Rails 4ins broad overall, ½ in thick & 3 ft 6in long, the feather 2 ½ ins deep & about 3/8 thick. Distance between the rails mils outside

¹¹⁴ C. Von Oeynhausen & H. Von Dechen (translated by E. A. Forward and edited by Charles E. Lee and K. R. Gilbert, *RAILWAYS IN ENGLAND 1826 AND 1827* (Newcomen Society and Published by W. Heffer & Sons Ltd. Cambridge 1971), pp. 23 and 25.

¹¹⁵ Barlow, Peter, *Second report addressed to the directors and proprietors of the London and Birmingham railway company* (London. B. Fellows 1835).

¹¹⁶ The Permanent Way Institution publication, *British Railway Track* (R. A. Hamnett 1964), uses a similar manner of depicting these.

¹¹⁷ Michael Robbins, *The Railway Age*, (Penguin 1962, pp. 11-17 following Lee, Charles E. Lee, *The Evolution of Railways* (London 1943), p. 104.

28 ½ ins. Form of the rail & joining as per Sketch & laid upon wooden sleepers'.¹¹⁸

As an aside, the cross-fertilisation also offered opportunities, possibly, for industrial espionage. The most thorough of these efforts was undertaken by von Oeynhausen and von Dechen between 1825 and 1827.¹¹⁹ With a zeal that rivalled Scharf, these two industrial spies paid particular attention to Hetton Colliery, as well as to the Liverpool and Manchester Railway. Around the same time, the well-known Philadelphian architect William Strickland (1788-1854) visited England. and made a report (Figs. 2.7 and 2.8).¹²⁰ As in the case of von Oeynhausen and von Dechen, Strickland was drawn to Hetton Colliery. Later, he made an identical copy of Wood's Killingworth locomotive, which had likewise been of interest to J D Harding and lithographed by Charles Hullmandel (see Figs. 1.17 1.18 and 1.19). Both these were influential in Bourne's adoption of tinted lithography.

Strickland states that he met with 'liberal kindness of the engineers of Great Britain and Ireland'. This rather negates the image of visiting industrialists secretly stalked railways for purposes of espionage. James Watt states that he was shown around the Merthyr Tydfil ironworks with courtesy and the detail shown by Oeynhausen and Dechen must have been openly obtained. Such foreigners as Angerstein (1753-1755) made tours of England and Wales to record and sketch industrial practices.¹²¹ Another Swede followed in 1802-3.¹²²

¹¹⁸ John van Laun, *Early limestone railways of south-east Wales*, University of Hull 1999, p. 281. Boulton & Watt Collection M/I/6/12, in three parts: See Margaret Sheila Gantee, 'James Watt Junior's Tour of the Forest of Dean and South Wales,' *University of Wales M A dissertation* 1993.

¹¹⁹ Von Oeynhausen & Von Dechen (1971), pp. 33-42 (Hetton Colliery) Liverpool and Manchester Railway pp. 43-48.

¹²⁰ William Strickland, *Reports on Canals, Railways, Roads, and Other Subjects*, published by H. C. Carey and I. Lea of Philadelphia in 1826.

¹²¹ R. R. Angerstein (translated by Torsten and Peter Berg), *R. R. Angerstein's Illustrated Travel Diary, 1753-1755: Industry in England and Wales from a Swedish Perspective*, (Science Museum 2001).

¹²² Eric T. Svedenstierna, *Svedenstierna's Tour of Great Britain 1802-3*, ed. E. L. Dellow and M. W. Flinn (Newton Abbot 1973).

From this relative openness one can guess that the British industrialists of the period were driven by a sense of pride in their achievements. The publication of the technical aspects of railway engineering had a long history.¹²³ However, it was the manager of the Hetton Colliery - Nicholas Wood - who produced the first influential work on the subject in 1825, chiming with the opening of the Stockton and Darlington Railway.¹²⁴

One may then ask how far Scharf's snapshots of engineering were intended as records or as preliminaries for publication. His sketches of the building of the British Museum and the Royal College of Surgeons in the mid-1830s were made at the same time as his railway sketches. They were in keeping with William Henry Pyne's publications at the beginning of the nineteenth century, as well as Ackermann's (1808-10) *The Microcosm of London*. This pattern continued with the Euston Extension with which Scharf was involved, following a sojourn at Primrose Hill Tunnel where he made similar engineering sketches. Again, I assume Scharf's sketches were a diversion from his precise work as an illustrator.

Whilst Scharf's initial sketches of permanent way mark the era when the London and Birmingham Railway was under construction, by the time Brees and Simms were publishing (see Chapter 1), permanent way on the London and Birmingham Railway had shifted from fish-belly rails to T-shaped, or parallel rails (Fig. 2.9), in response to Barlow's report.¹²⁵ By 1842 the fish-bellied rail was almost redundant.

*The rails originally introduced on this line were of the fish-bellied form, weighing about 50 lbs. to the yard, a few of which still remain at Kensall Green and Watford; but Professor Barlow's report to the Directors of this Company completely set this question at rest, and now fish-bellied rails are almost discarded.*¹²⁶

¹²³ M. J. T. Lewis, *Early Wooden Railways* (Routledge & Keegan Paul, 1970).

¹²⁴ Wood, (1825).

¹²⁵ Barlow, 1835.

¹²⁶ Francis Whishaw, *The Railways of Great Britain and Ireland practically described and illustrated* (J. Wheale, London, 1842), p.223

The fact of Barlow's Report being put into practice can be seen in Bourne's wash drawing of Hampstead Road Bridge (Fig. 2.10) made in 1836. This clearly shows parallel rails of multiple lengths were used, then keyed by wooden blocks rather than by the complicated use of spikes.¹²⁷

Such observations can also be extended to the types of sleepers used: stone or wood. To hedge its bets, the company chose to advertise for tenders for both stone-block sleepers and iron chairs, and alternatively, wooden sleepers with 'trenails' to secure them.¹²⁸ Whishaw states that a combination was used:

*On embankments transverse sleepers of Scotch fir, larch, and oak, are used as the foundation for the rails; and in cuttings, stone blocks; but on many parts of the line sleepers have been substituted to a great extent. ...The blocks are of Cornish granite and Whitby limestone, and are chiefly placed diagonally.... The joint-blocks contain each 5, and the intermediate-blocks 4 cubic feet.*¹²⁹

The change to wooden sleepers is partly bound up in John Howard Kyan's (1774-1850) discovery that the immersion of wood in corrosive sublimate provided a strong measure of preservation. He patented this in 1832 and again in 1836. This chimes with the steps being taken on the London and Birmingham Railway with the introduction of wooden sleepers.

The difficulties, which attended the use of stone blocks at length led to the substitution of wooden sleepers, which have now almost altogether superseded them. The traveller on the London and Birmingham line may notice, at intervals, extensive piles of the blocks which have been removed any number of which may be purchased for about eighteen pence each. Wooden sleepers are now almost universally employed, and they serve at once as a

¹²⁷ 'The rails are fixed in chairs of ordinary form, and secured thereto by compressed wooden keys, according to the now generally adopted plan2' (Whishaw 1842), p.223.

¹²⁸ *Staffordshire Advertiser* (30 January 1836 (British Newspaper Archive)).

¹²⁹ Whishaw, 1842, p. 223.

*support for the chair and rails, and as ties for keeping the line in gauge.*¹³⁰

We can rely on Bourne, as Fig. 2.11 shows a pile of such discarded stone sleeper-blocks on Watford Embankment, one showing two holes by which chairs were fixed.¹³¹ It is then of some comfort that seemingly unimportant detail – in this case, parallel rails with stone-sleeper blocks in cuttings and the discarding of the same on embankments - are picked out by Bourne as relevant for his illustrations.

Another matter with permanent way was ballasting by which stability was achieved.¹³² There are indirect examples to be found in Scharf, Bourne and Schnebbelie. In the supply and placing of ballast, Schnebbelie shows a convincing example being undertaken at Watford Station (Fig. 2.12). In this we see waggons on both sides of a cutting with those on the left showing navvies spreading the ballast with an empty waggon on the right. The latter can be equated by that illustrated in Scharf which sits indicatively as part of his illustrations on permanent way (Fig. 2.13).

Around the same time, Bourne produced accurate depictions of both end-tipping and side-tipping waggons (Figs. 2.14 and 2.15), which suggests they could be used for either ballast or dumping of spoil. Brees's illustration appears to have been influenced by Bourne's wash drawings.

Whishaw states:

*'The ballast is chiefly of gravel, 2 feet in thickness; in some parts, however, the gravel is in a thinner layer, and is superposed with loamy sand.'*¹³³

¹³⁰ F. S. Williams, *Our Iron Roads*, (London 1852), p. 235. Earlier confirmation comes in James Wyld, *The London and Birmingham railway guide, and Birmingham and London railway companion: by JWW* (London, 1838), p. xii.

¹³¹ These do not appear in the wash drawing-presumably a detailed sketch-as with others would have been drawn up.

¹³² Brees, 1838, p. 43.

¹³³ Whishaw, 1842, p. 223.

Figs. 2.16 shows a wash drawing by Bourne of a ballast train near Berkhamsted following the beginnings of the building of a high railway embankment at Berkhamsted Castle. The process used was that of 'cut and fill' with the fill coming from Sunnyside cutting a mile further south.

Another Bourne-type detail shows the identifiable ballast engine 2-2-2 *Harvey Combe* supplied by Robert Stephenson to W. & L. Cubit (Fig. 2.17).¹³⁴ This was brought from London and assembled at Bourne End.¹³⁵ The engine pulls side-tipping ballast waggons, similar to Fig. 2.18.

Such matters, relevant both to art and to engineering, can be shown in two approaches which arrive at the same conclusion: one from a scientific journal; another, a detail of an unpublished Bourne wash drawing.

First, the *Edinburgh New Philosophical Journal* states of the Liverpool and Manchester Railway that 'When sleepers [stone blocks] are used, a seat is cut in them for the chair, which is simply spiked down to them. A piece of cloth or *felt* dipped in pitch is generally interposed between the chair and the stone blocks to make the seat more solid'.¹³⁶ This simple statement can be translated into a detail of one of Bourne's London and Birmingham wash drawings (Fig. 2.19) made in 1837. In the detail, the cloth is spread out with the pitch bucket handy. The chair sits with the block already having had the seat cut ready for cloth and pitch for the chair.

As so often with Bourne, there is more to be drawn out than just this detail. One may correctly ask why these two westerly tracks are not in use as late as September 1837. The answer lies in the Great Western's original intention to use the west side of Euston as a terminus. (This is discussed in detail later.) However, the Great Western gave up that option in July 1837. In Bourne's work, we see them being put into commission for use by the London and Birmingham Company.

¹³⁴ Whishaw, 1842, p. 250.

¹³⁵ Percy Birtchnell. *A Short History of Berkhamsted* (The Bookstack Cleveland), pp. 85-88). William Prime Marshall, *London & North Western Railway locomotives: Introduction & pre-Ramsbottom* (<https://www.steamindex.com/locotype/lnwr.htm>)

¹³⁶ David Stevenson, 'Observations on the Liverpool and Manchester Railway' (*Edinburgh New Philosophical Journal*, October 1834...April 1835) (Edinburgh 1835), pp 323-4.

In this section, I have examined minutiae involved in laying permanent way at the dawn of one of the pioneering trunk lines. Bourne's accuracy of detail, when supported by other sources, establishes him as reliable for archaeological detail. Reflecting back on Chapter 1, I suggest, this accuracy added to his appeal for Britton, himself archaeologically motivated.

2.5 Primrose Hill Tunnel

The building of the Primrose Hill Tunnel formed part of the railway built under the First Act and lay within Scharf's initial interest. At various stages between 1835 and 1837, Scharf, Schnebbelie, and Bourne were involved in recording the work from beginning to completion. The illustrations therefore span much of the construction work on the railway in general.

As a means of satisfying the Eton College Estate, who held the land under which Primrose Hill lay, there was a certain amount of decorative façade used for the portal (Figs. 2.20 and 2.21). This included a mixture of Italianate and other references to the nearby mausoleum by Sir John Soane in Old St Pancras churchyard (compare Figs. 2.22 and 2.23). However, in the matter of style, the wings and portal had a purpose which follows that specified in the Act of Parliament.¹³⁷ Practically, it was to provide a cover for

An Iron Plate ... used to keep in the retaining or front wall at the mouth of a Tunnel. In the Primrose Hill Tunnel ...it is placed in the centre of the wall, with connecting Rods 100 feet in length, to another plate fixed in tunnel; but the method of securing the rods shewn on plate [Fig. 2.24] is considered superior.

The placement of the 'iron plate' had to be well back from the ornamental portal as can be seen in Fig. 2.25. Thus:

the Mouth of the said Tunnel at the Eastern End thereof shall be made good and finished with a substantial and ornamental Facing of

¹³⁷ This was a style picked up by Sir Giles Gilbert Scott for the K2 telephone kiosk introduced in 1926 (Fig. 2.23). Such a combination is recognised in its present-day listing by Historic England. 3° GUL. IV. Cap. xxxvi., CIII

*Brickwork or Masonry, to the Satisfaction of the Surveyor or Architect of the said Provost and College, so as effectually to prevent the Soil immediately above or around such Mouth from giving way or slipping down, and that the said Company shall at all Times for ever after such Tunnels and Facings shall have been constructed keep the same in repair.*¹³⁸

Bourne's wash drawing (Fig. 2.26), dated April 1837, provides sufficient detail to account for the method used to build the portal. The ornamental portal is being built to the front of it, with centring to hold the arch in place until completion. Work has barely started on the wing walls thus allowing free access for the installation of the iron plate and completion of the stone portal. The method of placing of the iron plate (Fig. 2.24) is not so dissimilar to the method of placing the iron girder at Parkway and Hampstead Road, discussed below.

On either side of the tunnel mouth, jib cranes are fixed to the base of a substantial and immovable pole (Fig. 2.26). At the tops of each pole are two pulleys to carry separate rope. Each rope has its own function: one to raise or lower the iron plate; one to draw it horizontally forwards or backwards according to the arc created by lifting or lowering the jib. Thus, in combination, the iron plate can be placed as required. The control of the ropes is performed from the top of steps on the pole, but the weight would have required a compound of blocks to give mechanical advantage particularly for the vertical lift. Other ropes, which link the tops of the main posts, are secured some distance beyond and act as anchorages that can be tensioned.

Fig. 2.27 takes us six months further on, with the wing walls completed but the main posts remaining in place. Possibly now those posts are acting solely as part of a jib arrangement for the placing of masonry.

Both these wash drawings by Bourne are commendable in their accuracy and the detail they reveal of the site generally. This ingenious building system allows for an assessment of Bourne's accuracy. Notably, Bourne tidies up the scene in his

¹³⁸ National Archives. Contract 1B: Camden Town to River Brent: Cast iron curb for unidentified tunnel RAIL 384/296.

lithograph (Fig. 2.28) by removing the scaffolding and posts. I suspect Simms had Bourne to hand (Fig. 2.21).

In general, the completed tunnel portal is a reasonably accurate outcome to Stephenson's drawing office plans and elevations. In Fig. 2.24 one sees the wings in plan with the inner mouth and architectural portal. There are also additions that relate to the curb placed at the tops of the shafts from which the headings were driven (Fig. 2.24 right).

There were a number of particular problems related to driving the tunnel. Firstly, though the limited overhead 'cover' would have allowed a cutting to suffice for this section, this was opposed by the landowners who wanted the railway out of sight. However, the relative lack of cover brought a threat of collapse during excavation.¹³⁹ The tone of the original Act suggests unintentional openings might occur in the cover, which might give the excuse for switching to a cutting. However, the nature of the portal arrangement made a specific exception 'save and except for the distance of twenty yards from the entrance thereof'. This is shown in Scharf's sketch of the temporary portal (Fig. 2.29). Furthermore, the size of shafts was limited to no more than 'eight feet in diameter, and only three such shafts shall be open at one time.'¹⁴⁰ Clearly, the threat of linking up shafts to make a cutting was in the minds of parliamentarians.

Another factor was the removal of spoil from the tunnelling itself. This spoil could not be deposited on estate land.¹⁴¹ It had to be brought up the shafts, then carried over the proposed entrance to what was termed 'the shoot,' from where it was discharged into waggons. Schnebbelie (Fig. 2.30) provides a view from the opposite direction, looking towards the 'depot' with the bridge carrying Chalk Farm Lane lying beyond the 'shoot'. In this image, the spoil was temporarily stockpiled and later removed to

¹³⁹ Act 1833 chapter 106. 'Provided nevertheless, that as respects those portions of the said Tunnel where the crown thereof is within fifteen feet of the surface of the ground over the same, no buildings shall be erected'.

¹⁴⁰ Act 1833 chapters 104 to 111. 'The miners should never be more than 6 or 8 feet in advance of the brick-layers, in order to guard against accidents from any subsidence of the earth'. Brees, 1838 p. 36.

¹⁴¹ 3 Gul IV Cap. xxxvi. chapter 106. 'That the ground, soil, and surface above the said Tunnel, shall remain the property of the said Provost and College of Eton.'

the 'shoot' for onward carriage to be used as fill as in Fig. 2.38. It also shows the trouble taken to preserve surfaces by the laying of duckboards. Fig. 2.29 shows fencing, as instructed in the Act, and similar barrows to those shown in Fig. 2.30 and drawn out in detail by Scharf (Fig. 2.31).

Apart from the lack of cover, the tunnel had other structural problems, such as the pressure of the London Clay, which swelled when exposed.¹⁴² This pressure caused the mortar to be squeezed from joints, and it crushed bricks brought into contact. To resist this pressure, the tunnel arch thickness was increased to 27 inches, stronger 'paving' bricks were used in place of London 'stocks', and quick-set Roman cement was substituted for lime mortar.

The complexity of this type of work on the line was summarised succinctly by Francis Whishaw of the London and Birmingham Railway.

*There is scarcely a portion of this line, from one end to the other, which is not either carried by embankment above the general surface of the country, or sunk below it by means of excavation. It has, indeed, in point of execution, been one of the most difficult works of the kind in the kingdom. London clay, disrupted chalk, and running sands, have sadly impeded the progress of the works; yet such is the perseverance of man, when he sets about a work in earnest, that all the formidable difficulties which sprang up in quick succession, and for a while seemed to arrest the progress of the works.*¹⁴³

The removal of spoil and lowering of materials, such as bricks and timber, was accomplished by horse gin. This method appears to have been the most common technique in building of tunnels along the railway. Scharf sketches two of these gins in operation (Fig. 2.29 circled), which he shows in more detail in elevation (Fig. 2.32) as 'Machinery ...with the Tunnel of the Birmingham Railway near Hampstead' with the note that the diameter of winding headgear was 'about 34 feet from B to C'.

¹⁴² <http://www.crht1837.org/history/tunnel>.

¹⁴³ Whishaw 1842), p. 224

A detail of this image shows the workings at the shaft (Fig. 2.32 left) with a full kibble coming to the surface to be off-loaded into a waggon. The Act specified the shafts should be no more than 'eight feet in diameter, and only three such shafts shall be open at one time'.¹⁴⁴ At Northwich Tunnel, it was further specified that 'The brickwork shall rest upon a cast iron Curb, fitting into the crown of the arch of the tunnel, forming a level base for the shaft to rest upon'. A similar arrangement likely applied at Primrose Hill (Fig. 2.33).

Figs. 2.34 and 2.35 show more clearly Brees's interpretation of Scharf's drawing of a 'horse gin'. In this, a horse walks around a circular track with a harness connected to a drum around which was a double rope: one part descending into the distant shaft with materials; the other ascending to bring up spoil. In Figs 2.32 and 2.34, the two pulleys are clearly shown to guide the two halves of the rope.

The overhead frame of the horse gin was strengthened by an arch (bow and string), which bore the weight of the load in the shaft. The addition of the plan (Fig. 2.35) shows the circular walk for the horse and two ropes-one ascending and the other descending. Bourne's wash drawing of a horse gin at Kilsby Tunnel can be safely attributed to a similar arrangement at Primrose Hill (Fig. 2.36).

2.6 Birmingham Railway Dépôt

The southern terminus of the railway built under the First Act was the 'Birmingham Railway Dépôt' (Fig. 2.37). This was replaced with the terminus at Euston Station under the Second Act. Bourne's unpublished drawing (Fig. 2.38) shows the Boundary Wall under construction before the crossing of the Regent's Canal by the Euston Extension, and the full development as a depot from where it ran to a junction with the main line where it joined the Euston Extension.

Other artists were also drawing here including George Scharf and Robert Biemmel Schnebbelie. Bourne's wash drawing looks northward towards Chalk Farm Lane with the bridge which crosses the railway just in view. 'It is altogether raised on an embankment of clay, the produce of the Primrose Hill tunnel and contiguous

¹⁴⁴ Brees, 1838, pp. 37-8.

cuttings'.¹⁴⁵ This eastern side shows the spoil being dumped in fingers from end-tipping waggons no doubt similar to Fig.2.39, which lacked flanged wheels.

Bourne's wash drawing follows an aesthetic approach in which shafts of light pierce through the arches created by the lowness of the winter sun that also cast shadows beyond. Possibly Bourne saw in the roofless arches a view reminiscent of ruins.¹⁴⁶

George Scharf was already on the scene here north of the Regent's Canal, even before the Euston Extension Act was passed in July 1835. Because he was concentrating on recording the permanent way and the building of the Primrose Hill Tunnel, it was not until June 1837 that he turned his attention to the Dêpot. Bourne pre-empted him on this site by some months.

Scharf's June 1837 view (Fig. 2.40) shows the progress made since Bourne's October visit. By now the opening of the Euston Extension was anticipated, so the function of the Dêpot was related to the building and servicing of locomotives and rolling stock.

In July 1837 trains started running out of Euston and the station, apart from the propylaea, was complete. However, forges and foundries were not permitted on the Euston Extension, so the company turned its attention to the Camden Depot for such purposes. The terminus was abandoned. The extensive 33-acre parcel was given over to transshipment, a Stationary Winding Engine and the maintenance and stabling of locomotives. The company's headquarters was placed on the seven-acre site at Euston Grove.

Scharf's view (Fig. 2.40) is essentially providing information and does not function as a work of artist expression. It seems to have been composed from the top of the 'Offices' and also seen in the tall red-brick building to the right of Fig. 2.41 (Camden Station). Scharf's panoramic view looks towards Chalk Farm from the southeast and was probably sketched with a view to creating other pictures. For instance, it is annotated to show Chalk Farm and Hampstead Road and describes detail such as '6 windows'. Letters A-A and B-B suggest Scharf intended to produce detailed images.

¹⁴⁵ Whishaw 1842, p. 229

¹⁴⁶ The view appears to have the accuracy which Bourne was later to display in his Kiev work where he went on to use photography in the 1850s.

To some extent, Scharf's sketch can be rationalised to Whishaw's description.¹⁴⁷ Although not named, one can see the bridge over Chalk Farm Lane and the Locomotive Engine House to the left. The general looseness of the pencil drawing shows a rapid hand putting down detail.

Schnebbelie's panoramic watercolour (Fig. 2.41) looks north with Chalk Farm Bridge to the left and Camden Town Station to the right and roughly covers the whole site shown in Fig. 2.40. The foreground contains a delightfully informal scene of top-hatted gentlemen and ladies with parasols promenading among the trees of Regent's Park, or sitting Monet-like with spread tablecloths at a 'dejeuner sur l'herbe'. In this, Regent's Park and the Birmingham Dépôt are deliberately divided from each other by the canal. To the left are the two tall chimneys of the Stationary Engine which suggests a post-October 1837 date. To the right is the Locomotive Engine House in the centre, with the 'Offices' (so labelled on Fig. 2.40).

There are some anomalies. Despite the chimneys for the engine house, there is no evidence of the Regent's Bridge (to be discussed below) or the railway. Possibly Schnebbelie did not wish to destroy the obvious Picturesque nature of the picture.

Fig. 2.42 shows the later developments at what became Camden Station. Even so the Locomotive Engine House (squared) can be picked out, as can the Stationary Engine (circled) and the point from which Scharf and Bourne sketched (arrowed).

With these three images, one gathers something of a varied aesthetic. Bourne sets the scene with an accurate display but with Picturesque leanings. Scharf's sketch provides information for working into a picture. Schnebbelie provides an obvious watercolour which delights (Fig. 2.41). One might add that Fig. 2.42 draws these together. I also propose architectural terms 'polite' and 'vernacular,' with the polite approximating Picturesque and the architecture of Bourne, and the rough and ready of Scharf associating with the vernacular.

¹⁴⁷ Whishaw, 1842, pp. 229, 232 -33.

2.7 Building the Euston Extension

The Euston Extension was authorised in 1835 to cross Regent's Canal, but it was limited to the carriage of passengers and their luggage and small parcels.¹⁴⁸ The importance of this extension was that it gave people direct access to the metropolis.

It was the heavy engineering through London clay that attracted Bourne to the novelty of workings. These were unique at the time. Others, however, responded differently to such major upheavals. The works prompted the censorious Charles Dickens.

The first shock of a great earthquake had, just at that period, rent the whole neighbourhood to its centre. Traces of its course were visible on every side. Houses were knocked down; streets broken through and stopped; deep pits and trenches dug in the ground; enormous heaps of earth and clay thrown up; buildings that were undermined and shaking, propped by great beams of wood.

Everywhere were bridges that led nowhere; thoroughfares that were wholly impassable ... fragments of unfinished walls and arches, and piles of scaffolding, and wildernesses of bricks, and giant forms of cranes, and tripods straddling above nothing.¹⁴⁹

It is generally considered that Bourne's first drawings relate to those made at Hampstead Road Bridge in August 1836, but there is a group of loosely sketched wash and gouache drawings which may have been made of the Euston extension before April 1836 (Appendix 2).¹⁵⁰ These can be safely attributed to Bourne.¹⁵¹

¹⁴⁸ National Archives - Extension contract (Camden to Euston Square) including bridges 1-9 RAIL 384/211.

¹⁴⁹ Dickens 1848, p. 46.

¹⁵⁰ Ironbridge Gorge Museum Trust, AE. 185,15, 129, 132, 134, 136, 139, 140.

¹⁵¹ These form part of the Elton Collection at Ironbridge (Michael A., Vanns, *Witness to Change. A Record of the Industrial Revolution. The Elton Collection at the Ironbridge Gorge Museum*, (Ian Allan. 2003)).

In Fig. 2.43 one sees these early stages of the excavations, but they are deep enough to need fencing which was a safety precaution required under the Act. However, the workings are still shallow enough for spoil to be brought out by horse and cart by using the slope on the left.

By April 1836 the workings had deepened suggesting that they were in preparation for carrying the road under Park Street. These were recorded by Scharf (Fig. 2.44), whose caption states 'near Regents Park').

Scharf's sketch gives an indication of the work going on. One sees a pump at work to dry out the lower levels in the water-logged London clays where bricklayers are at work (circled). The bricklayers are being serviced by labourers carrying bricks in hods, and scaffolding is being placed to support planks for the workmen laying bricks as the walls rise. Thus, there is a progression in the image, likely on site too, which can be followed from the left.

One also sees more detail of how the cutting is advanced by bringing out the spoil. After excavation by pick and shovel, spoil was hauled up a plank in a barrow-over short lifts (as here) this was done by counterbalance. The barrow going up was assisted by one going down on a separate plank (known as a 'run' – see Fig. 2.45). The down-going navvy can be seen pulling against the up-going full barrow. In deeper cuttings, as at Tring (see below), a horse was needed on single 'runs' to haul the full barrow to the top. On such arrangements, there was then no need to wait for up or down barrows.¹⁵²

2.8 Parkway to Hampstead Road

Fig. 2.46 shows the section between Park Street and Hampstead Road Bridge which by 20 July 1836 was

...brought close to the Road on the north side, and the castings for the remainder are in readiness to put up [and] the excavation and bridges between this point and the Hampstead Road are proceeding [with] half the bridge at Mornington Place ... finished and the Road

¹⁵² See also A W Skempton, 'Embankments and cuttings on the early railways' *Construction History*, 11 (1996), pp. 33-49.

*... already carried over it. The remaining Bridges are in an equal state of forwardness.*¹⁵³

This general statement makes it clear Park Street and Hampstead Road Bridge required excavation and castings. Therefore, they were to be engineered as two cut-and-cover tunnels. The following extract from the Act of Parliament gives some idea of their finished state.

*a good and sufficient Tunnel, with proper Parapet Walls and Wing Walls, for carrying the said Railway under each of the said Roads called the Hampstead Road and Park Street ...where the said Railway ...crosses the said Roads respectively; and that the Length of each of such Tunnels shall not be less than Thirty Yards on each Side beyond the Extent of the said Roads and Footpaths, except on the Eastern - Side of the Hampstead Road, where the said Company shall erect such Wall or other Fence as shall be required by the said Commissioners; and that each of the said Tunnels shall be so constructed that the Soffit of the Arch thereof shall not be less than Three Feet beneath the Surface of the Road under which the same shall pass, and that the Thickness of the Materials of such Arch shall not exceed Two Feet above such Soffit, and the Surface of such Roads after the Completion of such Tunnels respectively shall remain at their present Level.*¹⁵⁴

There had to be sufficient cover to avoid collapse. Additionally, the use of cast-iron girders did much to reduce the self-weight of the cover and was therefore able to support the weight of the road (Figs. 2.47 and 2.48). Stephenson's use of cast iron was undoubtedly due to his familiarity with Tredgold's experiments with the strength

¹⁵³ London Committee Minutes 20 July 1836 (TNA:PRO RAIL 384/43-75). Reference kindly supplied by John Liffen. National Archives RAIL 384/154 Extension from Camden to Euston: William & Lewis Cubitt.

¹⁵⁴ 3 Gul IV Cap. xxxvi para. LXXVIII (p.84).

of sections.¹⁵⁵ An 1831 edition of these can be seen in Fig. 2.50 that possibly belonged to Robert Stephenson.¹⁵⁶

The 20 July 1836 claim appears to have been an exaggeration: far from nearing completion, the cut-and-cover tunnel at Parkway was only having its ‘castings’ (girders) placed in September. However, judging from a possible earlier visit by Bourne (Fig. 2.49) one gathers progress was rapid in the intervening period. Even so, in September (Fig. 2.47) adjacent buildings were threatened and propped up. This supported Dickens’s claim that ‘buildings that were undermined and shaking, propped by great beams of wood ... Everywhere were bridges that led nowhere; thoroughfares that were wholly impassable’. Despite this, the September view is seemingly of a well-organised appearance around the placement of the girders. (This will be discussed in more detail when dealing with Hampstead Road Bridge.)

The July 1836 minutes continue with the description of the works directly to the south - ‘the excavation and bridges between this point and the Hampstead Road are proceeding [with] half the bridge at Mornington Place ... finished and the Road ... already carried over it. The remaining Bridges are in an equal state of forwardness.’ Figs. 2.51 and 2.52 (wash drawing and lithograph) show part of this section under construction in September 1836 – the view looks north from the west side of the excavations. Park Street Tunnel can be seen in the distance and still under construction. That is confirmed by the central pillars just visible (circled) which have not yet had the cast-iron girders placed on them (see detail).

Much can also be deduced from a study of the building of the revetment shown in Figs. 2.51 and 2.52. Such deductions can be made through comparison with Bourne sketches located in the Elton Collection (Figs. 2.53 to 2.57) and probably datable to September 1836 (see Appendix 2). Such deductions can be confirmed by the wording of the contracts.

¹⁵⁵ Thomas Tredgold, *Practical Essay On the Strength of Cast Iron, And Other Metals: Containing Practical Rules, Tables, And Examples; Founded On a Series of New Experiments, With an Extensive Table of the Properties of Materials*. 3d ed., improved and enlarged (London 1831).

¹⁵⁶ Harford University owned by Stephenson’s nephew (G (George) R (Robert) Stephenson (1819-1905) an influential member of the Institution of Civil Engineers.

*The faces of these walls will be a Curved Batter; the radius of this batter will be 50 feet, giving an average batter of 2% inches per foot on 20 feet in every case, excepting in the walls from Crescent Place to Park Street, which have a radius of 61 feet 8 inches, being an average batter of 2 inches to a foot on 20 feet. The whole of the brickwork of the walls will be laid in courses radiating from the supposed centre of the curve of the batter. The walls will increase in thickness the nearer they are to the foundations, by half-brick offsets, and the footings will consist of steppings of two courses of brick, projecting one-quarter of a brick.*¹⁵⁷

These studies by Bourne appear to have used at the time of the transference of the wash drawings onto stone.

The excavations shown in Figs. 2.51 and 2.52 merge into Fig. 2.58, which lay to the south and looking southward with John Nash's 1820s Park Village. - 'a perfect example of *rus-in-urbe*' on the west side (right) and St. Paul's Cathedral in the distance. This view ends in a trench cut in the middle distance. That trench continues southward to emerge at Fig. 2.61.

In finding an explanation for the method of reduction, Fig. 2.59 provides a reasonable guide. A narrow header trench advances into which waggons are run and filled from the sides from planks which bridge across. Once the sides are sufficiently reduced the widened area is laid with track and widening continues from the sides. Until the full width is achieved, lines are laid and the trench widened accordingly.

Once again, the problems faced in making these cuttings was the swelling of the London Clay. In this case, swelling occurred on the western side. As Dempsey shows, this was overcome in one case by temporary cast-iron bracing and the removal of clay on the west, replacing it with reinforced vaults, then removal of supporting girders (Fig. 2.60).¹⁵⁸

¹⁵⁷ Brees, 1838, p. 20.

¹⁵⁸ George Drysdale Dempsey, *The practical railway engineer. Examples of the mechanical and engineering operations and structures combined in the making of a railway* (London, Weale, 1847)

The pilot trench seen in the distance of Fig. 2.58 can be seen emerging to the left of Fig. 2.52 (2.51) looking south from Mornington Crescent Bridge then under construction (“half the bridge at Mornington Place” of the July minutes). In the distance lies the completed Stanhope Bridge (Fig. 2.62), that is the one with “the Road ... already carried over it”.

Elements of the construction methods can be teased out from Fig. 2.61 (see details). Sheer legs and a winch are used to carry masonry and place it whilst planks are used for the workmen to cross and locate it. These are typical Bourne touches, adding to the veracity of his narrative: the revetment is to the front of the artist and complemented by finished revetments opposite as it proceeds towards Stanhope Bridge.

2.9 Hampstead Road Bridge

Beyond Stanhope Bridge lies Hampstead Road Bridge. Like Park Street this was built as a cut-and-cover tunnel (Fig. 2.63) with a cast-iron girder roof. However, Hampstead Bridge is better documented than Park Street through the illustrations of Bourne, Scharf, Schnebbelie and Bury from 1836 and its opening in July 1837. Each artist used different approaches and an assortment of media. Those by Scharf are of a technical nature and have much in common with Brees’s ‘Railway Practice’ derived directly from Stephenson’s engineering drawings. It therefore seems likely that Scharf was recording through general interest, as was his habit.

From the illustrations it is clear that some properties would need to be demolished and rebuilt as in Fig. 2.63.

*The Contractor will see by Drawing No. 10, the houses which are intended to be taken down for the erection of this bridge, and he will be held responsible for any damage that may accrue to any other house except those specified.*¹⁵⁹

Fig. 2.64 is a view looking south towards William Inwood’s St Pancras Church completed in 1822. In the distance, to the left, lies St Paul’s Cathedral. It was this sort

¹⁵⁹ Brees, 1838, pp. 9 and 10. There is a well-used copy of a plan ‘Intended changes to be made at Hampstead Road’ (Network 218992) which appears to be this.

of disruption that prompted Dickens's 'deep pits and trenches dug in the ground; enormous heaps of earth and clay thrown up'.¹⁶⁰

The first view we have of the actual bridge under construction is by Schnebbelie (Fig. 2.65). It shows the south side with the semblance of a skeleton and scaffolding and lifting tackle in place suggesting that the girders were on their way as noted in the Committee Minutes of July 1836.

The Stephenson Contract for the bridge gives details which can be amplified by analysis of Schnebbelie, Bourne and Scharf and (Figs. 2.65, 2.66, and 2.72).

The face of the piers and abutments, the impost, plinth of the parapet, and pillars of the same, are to be stone, also the facing of the plinth of the pillars in the pier. The pier will be a series of pillars with invert sprung between them, and the impost stone laying on the top from pillar to pillar above the opening. Each of these stones must be 6 feet long. In the abutments, the pilasters project only half a brick from the face of the wall, which increases in thickness as it gets lower. On the stone impost, and immediately over those pillars, the iron girders rest, whose ends are made flat to lie upon the stone.¹⁶¹

Fig. 2.66 shows excavations in August 1836 but looking from the opposite direction to Fig. 2.67 (towards the northwest). Here the cutting is deep enough for a temporary overbridge to be required. Fig. 2.67 shows roughly the same area as Fig. 2.66 drawn further along the same side but showing the same shuttering being set in place. The location of Fig. 2.67 is confirmed by the inclusion of St Mary's Church in Eversholt Street and part of Hampstead Road Bridge which equates with Schnebbelie (Fig. 2.65).

Some key elements can be extracted from Fig. 2.67 to confirm Bourne's eye for detail. Such is the winch ready to assist in the placement of parts of the imposts for the central spine - hence the double projections. Another detail seen in the same

¹⁶⁰ Dickens, *Dombey & Son*, 1848 Chapter 6.

¹⁶¹ Quoted in Brees 1838, pp. 9 and 10.

extract, which can be compared with a preparatory sketch (Fig. 2.68), shows construction of the revetment.

The building in Figs. 2.69 and 2.70 is Wellington House Academy, attended by Dickens in the 1820s. Its position can be compared with the position in Fig. 2.66. Possibly, memories of his time here prompted the censorious writings of the Camden excavations in *Dombey and Son* (1846-48).

Fig. 2.71 shows the state of construction by September 1836. In this one looks towards the location of Fig. 2.66 with the temporary bridge beyond. By now the central supports for the girders were underway (note the scaffolding on the left). Regarding erection of the girders:

The Girders are curved and have a versed sine of about 2 feet 6 inches. Each girder must be of the best No. 1 iron, and they must be proved with a weight of not less than 40 tons. Groined cross Arches are sprung from one girder to the other the whole length of the bridge [see Figs. 2.72], and they must be well set in Roman cement. Two round wrought iron Bolts of not less than 2 inches in diameter must pass from the front girder through three cross arches, and be firmly keyed in.

The four Girders for the Faces of the bridge will be different from the others in their construction and will be flat on the top to receive the stones which form the projecting string-course [as in Fig. 2.73]. An ornamental cast iron front will be bolted to each of these girders [Figs. 2.74 shows the projections to which the face is secured].¹⁶²

Figs. 2.75, 2.76, 2.77, 2.78 indicate the dissemination of technical drawings. Possibly these came from Scharf, but more likely were based on Stephenson's Drawing Office, which were probably distributed through Brees and others.

Before turning to the actual erection of the bridge, I first consider the problem of transportation to the site for those 17-foot iron girders. Both Scharf and Bourne give some evidence for the process (Fig. 2.79). This combines a sketch of one of the

¹⁶² Quoted in Brees, 1838, pp. 9 and 10.

girders with a giant-wheeled 'carriage'. Scharf had already drawn a similar girder, which suggests that these are related. In this detail, we see a similar carriage burdened with a cast-iron beam taken under Wriothersley Bridge on its way to Hampstead Road (Fig. 2.80). It bears strong similarities to Capability Brown's method of moving trees (Fig. 2.81).¹⁶³

The actual placing of girders at Hampstead Road was a process similar to that used at Parkway (Fig. 2.47). It will serve as an explanation for both. In Fig. 2.81 Scharf's view to the south shows the general arrangement for building the bridge. The upright walls contrast with those that are curvilinear running towards Euston.¹⁶⁴ The limited number of girders already placed suggests a date of early August 1836.¹⁶⁵ However placement may have started in July and was still going on into October 1836. At Parkway, placement followed approximately the same pace.

The process was the same at both sites. In Fig. 2.82, one sees a rope running through a pulley at the top of a tall derrick that connects to a block and tackle placed around the iron girder. Next, that girder is hoisted into place under the direction of a top-hatted foreman directing workmen either side. The ends of the girders are then 'hooked' into place in the gaps on the imposts. Where the girders join down the central spine they seem to have been bolted together (Fig. 2.84). In Fig. 2.82 the ornamental facing is already in place while other girders lie on the ground ready for assembly.

Fig. 2.47 shows the same process by Bourne at Parkway and offers comparison. In his sketches one sees the manhandling of the girders which, in Bourne's eye for detail, adds to their verisimilitude.

While construction was underway, Hampstead Road Bridge was of great public interest. The scene was one of few wash drawings by Bourne selected to illustrate

¹⁶³ As in Sir Henry Steuart, *The Planter's Guide; Or, A Practical Essay On The Best Method Of Giving Immediate Effect To Wood* (John Murray, London (1828)).

¹⁶⁴ Jackson, 1987 p134 -5 dates this as May 1836.

¹⁶⁵ It is even likely that they were ready for placement as early as May 'One of the Iron Arches of the Bridge over the Railroad on the Hampstead Road [with] Section of iron arch. May 1836 D. Scharf del' (British Museum 1862.0614.400) (see Fig. 2.75).

the Euston Extension in his *Drawings* (Fig. 2.86). Schnebbelie selected the site as a celebration of the opening (Fig. 2.88), and Bury chose it as one of six aquatints for his collection about the railway (Fig. 2.89).

The accuracy of Fig. 2.88 (probably painted from Stanhope Bridge) is confirmed by the picking out of the roof of the Euston train shed alongside the 'Colonnade' entrance building to the right: in the distance lies St Paul's Cathedral. Both sides of the railway, and the bridge itself, are lined with crowds and a balloon flies overhead. Such junkets make it likely that this was the opening of the railway on 20 July 1837.

The underneath of Bury's aquatint (Fig. 2.89) of Hampstead Road Bridge looks towards Euston with the three bridges between (Fig. 2.90).

2.10 Hampstead Road Bridge to Euston

In 1827 the land between Hampstead Road Bridge and Euston Grove was open (Fig. 2.91), but by September 1837 the three bridges were completed (Fig. 2.90) and included on the Stephenson plan (Fig. 2.91) running downwards towards Euston Station. The final bridge, Wriothersley Bridge (wrongly labelled as Hampstead Road Bridge in Fig. 2.93), was built by October 1836 and lies in the distance of Fig. 2.90 and immediately north of the projected Euston Station.

In Fig. 2.95 one sees the near bridge in Fig. 2.90 as only recently started in August 1836. The view looks in the opposite direction to Fig. 2.90, and therefore northwards, to Hampstead Road Bridge: the southerly bays of which already built as shown in Fig. 2.67. In August 1836 we see the site of Fig. 2.94 in a state of preparation. The revetments on both approaches have been left open with one of the stone haunches in place from which the stone arch will spring. In the middle is the central wooden prop ready to support the wooden centring which lay on the ground. Once in place the finished stone arch will support the deck thus bringing the level up to that of the gap in the revetment. The near bridge in Fig. 2.90 is possibly the same bridge.

One may question why three apparently isolated bridges should be needed. Cary's map provides the answer (Fig. 2.98). It shows the projected railway running down to Drummond Street with two stubs of streets projecting slightly into the area: one (Little Clarendon Street) was to be slightly diverted into Wriothersley Street with its bridge;

the other (Duke Street) would give access to the arrival side (east) of Euston Station.¹⁶⁶

2.11 Euston Station

Bourne had produced a wash drawing of the vacant site at Euston Grove in October 1836 (Figs. 2.93). It was not until May 1837 before he returned from his peregrinations towards Birmingham having produced a large proportion of what was to be used in the published drawings. By then, the station was complete except for Philip Hardwick's Greek Propylaea and its side pavilions (Fig. 2.99).

Although Britton's topographical map (Fig. 2.101 extract) shows the 'Birmingham Railway Depot' as complete, there are certain anomalies. The seven-acre site is shown correctly as bounded on the north by Wriothersley Street, with its bridge over the railway. However, the inclusion of the 'Grand Entrance' (meaning Philip Hardwick's portico) was based purely on intention and not observation.

In this section I intend to assess the whole site when operated under the London and Birmingham Railway. I shall begin with the building of the portico as a statement of the railway's status. The portico was commissioned in 1836. Ambitions for the terminus grew by the beginning of January 1837 such that the Directors considered it should receive some architectural embellishment. Accordingly they adopted 'a design of Mr. Hardwick, for a grand but simple portico, which they consider well adapted to the national character of the undertaking'.¹⁶⁷ A Greek Revival propylaea was chosen as a monumental gateway to the 'great highway' leading to Birmingham and beyond.

The original Hardwick elevation (Fig. 2.101) shows a strictly Greek Doric order based on Stuart and Revett.¹⁶⁸ The phrase 'national character' suggests a reason for the choice of Greek Revival, a style in the ascendency at this time.¹⁶⁹ Phillip Hardwick through his hat in the ring in favour of Greek Revival with his Diploma work for

¹⁶⁶ Joe Cain. <https://profjoecain.net/euston-grove-history-of-a-london-street-nw1>.

¹⁶⁷ *Mechanics Magazine* 700 Jan 7, 1837, p. 407, again in 713 8 April 1837. p. 2.

¹⁶⁸ James Stuart and Nicholas Revett, *The Antiquities of Athens* many editions since 18th century.

¹⁶⁹ Weibenson, 1969.

acceptance as a Royal Academician (Fig. 2.103). For example, it was emphasised in his contribution to the annual Summer Exhibition (1837), when he showed ‘the principal entrance of the London station of the London and Birmingham Railway, now erecting near Euston Square;’ (No. 1106). This appears to be the design shown in Fig. 2.101, whose provenance is the British Railways Board. In the same exhibition was a piece by Hardwick noted as ‘the principal entrance of the station at Birmingham, now building’ (no. 1023). I discuss this last item near the end of the present chapter.¹⁷⁰

The May 1837 view (Fig. 2.99) shows the train sheds open to the south where the two easterly pavilions would be built. But there is a shadow cast which would have come from the propylaea then under construction. In October 1837 (Fig. 2.104) both sets of pavilions were underway and by January 1838 both appear complete. (Fig. 2.105) with capitals installed on the propylaea.

Fig. 2.106 shows the complete group recorded by Bourne in April 1838 including the gates (Fig. 2.108). Fig. 2.107 is possibly the best-known of Bourne’s lithographs of the London and Birmingham Railway. However, it postdates Hardwick’s Royal Academy exhibit by almost a year. Nevertheless, by its obvious availability, plus its recording of the completed ensemble, it became an icon for the railway. There are, however, also added factors which show Bourne’s accuracy as an archaeological recorder to highlight in Fig. 2.109.

The railway did not have to wait for the completion of its Grand Entrance. It was July 1837 before the first trains ran out from Euston.

One of the main factors governing the layout of a station was desire for throughput, involving sufficient trains (seating and haulage), comfort, and organisation of passengers both for arrival and departure. Ideally the transfer of passengers from one railway system to another would have been an advantage and this was the original intention with the Great Western Railway taking up the western part of the Euston site. In 1846, the London and Birmingham Railway amalgamated to form the London & North Western Railway. Euston became the headquarters of the new

¹⁷⁰ *Mechanics Magazine*, No. 720, 27 May 1837, p.117.

railway, and the company was able to expand westward into the vacant site seen in Fig. 2.110 on the left side.¹⁷¹

In the original station, outbound passengers passed into the station complex through the portico as in Figs. 2.109. By comparing Figs. 2.109 and 110 one can follow a passenger's progress from their entrance at the portico to departure at the train shed (both circled).

The entrance (a) leads into an oblong court-yard, enclosed by walls, and about 470 feet in extent, from north to south, by 100 in width, until it begins to contract with a curved slope on each side, so that at the north end the breadth is reduced to 38 feet. On the east side is a range of building, with a light colonnade (b) for the accommodation of passengers

*Those of the first class enter at c and deliver their tickets in the office d, and wait for the trains in e. The others enter at f, deliver their tickets in g and wait in h, or on the terrace i i. K is the entrance for carriages and heavy goods intended to be conveyed by the trains, which start from town on the rails l l, and mm. The offices (nn) are for booking passengers, &c.*¹⁷²

After passing through the booking procedures the passengers emerged onto the departure platform (i) where the down train lay (Fig. 2.111). Scharf also captured the atmosphere of a down train in 1843 before amalgamation (Fig. 2.112).

The process of moving coaches around was an operation that had to be done one coach at a time by a series of turntables - marked on Fig. 2.110 by small circles set around squares symbolising movable track within. Fig. 2.113 (detail of 2.99) shows

¹⁷¹ In 1838 the Company vacated its offices in Cornhill and moved to Euston, presumably occupying the rooms over the booking office and perhaps some buildings elsewhere on the site.

¹⁷² Edward Cornelius and William Osborne, *Osborne's London and Birmingham Railway guide*. Illustrated (Birmingham and London 1840), pp. 65-70. Much of this appears to have been lifted from Britton's *Description*.

one of these at the end of the departure platform and one that was recovered when Euston was rebuilt (Figs. 2.114 and 2.115).

Fig. 2.116 looks south showing the train shed with the departure platform on the right and arrival platform on the left. The Doric Portico lies behind the 'down' line and Inwood's St Pancras Church is to the left of the 'up' line.

The train shed was designed by Charles Fox (1810-74), a great advocate of the use of iron. (Fox's career as a mechanical engineer is discussed in more detail later.¹⁷³) A protégé of Robert Stephenson, he built a number of structures on the London and Birmingham Railway. Fig. 2.117 shows his framework for the train shed as designed. Fig. 2.118 depicts its dismantlement (see also Fig. 2.119). Following corporate amalgamation in 1846, the terminal underwent major alterations. This included insertion of a great hall, meeting room, board room, general offices, and new booking offices. The old booking office block was incorporated into this scheme, becoming one of the two booking offices flanking the new Great Hall (Fig. 2.120). Enlargement was made possible by extending westward into the intended site for the Great Western Railway. The architect chosen was once again Philip Hardwick, but the work carried out by his son, Philip Charles Hardwick (1822-92).¹⁷⁴

2.12 Travelling the Euston Extension, Including the Stationary Engine

The passengers having embarked in:

the carriages assigned them, and having found their seats, another signal is soon given [and the train] which has been retained standing on a slight inclination by a check, is moved gently onwards down the descent, which is called by the engineers the 'terminal plane' ... On the right side, immediately beyond the shed, we pass an extensive building, where carriages are manufactured [see Fig. 2.111] and shortly afterwards the train is stopped beneath the first bridge

¹⁷³ Michael R Bailey, *Robert Stephenson - The Eminent Engineer* (Routledge 2003) (James Sutherland 'Iron Railway Bridges', pp. 304-308).

¹⁷⁴ <https://www.british-history.ac.uk/survey-london/vol21/pt3/pp107-114>.

[Wriothersley Figs.2.93], to be attached to the endless rope Here is situated a powerful wheel, fourteen feet in diameter, round which the endless rope is fixed; and when the rope is moved by the stationary engine at Camden Town, the wheel turns with it; the rope is two miles and a half in length, ... it runs all the way on fixed pulleys which at the curves are made to slope in a contrary direction to the curve, and have also an arm or shield to keep the rope from getting out.¹⁷⁵ [Fig. 2.121

The journey continued through the Great Excavations to the bridge over Regent's Canal and so on to the Stationary Engine which, for a period hauled up the trains. Soon after this spot, the Euston Extension formally ended with a junction to the line authorised under the first Act.

The approach leads to the Regent's Canal Bridge with beyond the two chimney stacks which served to evacuate the waste gases (Fig. 2.96). A closer view suggests rope haulage was on all four tracks (Fig. 2.97). This is incorrect: rope haulage was only applied on the two to the right (east): of these two, the left-hand track, was for haulage whilst the other ran slack.

The correct arrangement is shown in Fig. 2.122, though the view looks towards Euston, and everything is reversed. The two tracks on the left were dedicated to work with the Stationary Engine and the down-line occupied by a train – this is under tension.

Bearing in mind the rope was continuous, some system was required by which the leading coach could be temporarily attached to any part of it and released when required. For this, the nautically termed 'Messenger' was used.¹⁷⁶ The proceedings were under the control of a 'policeman' who was placed in an 'apartment' as seen in Fig. 2.124. His duty was to unhitch the leading carriage from the continuously moving rope at the appropriate moment so that the carriage could glide forward to join a locomotive for the journey towards Birmingham.

¹⁷⁵ Osborne 1840, p. 71-72.

¹⁷⁶ Such a term was derived from the light line used nautically whose purpose was to draw in a heavier line to secure a ship.

This then demands some explanation for the other two tracks: in this Fig. 2.123 is helpful. In this one can see two stubs (circled) which would have been intended for the Great Western Railway terminus. This was abandoned by Act of Parliament on 3 July 1837 with the GWR receiving their Act to run into Paddington. As a result, by means of points, the stubs were realigned into the London and Birmingham train shed where they joined the existing central lines as confirmed in Bourne's wash drawing of May 1837 (Fig. 2.99).

It was intended that the Stationary Engine would serve both railway companies with one engine for each. With this in mind, a tender was accepted in July 1836 from Maudslay, Sons and Field to supply two 60 h.p. condensing steam engines. As we shall see the Stationary Engine housing was built with this in mind, but only the east engine was commissioned where it would serve the two London and Birmingham tracks - one upwards from Euston and the other downwards. The Stationary Engine was operational from October 1837 with locomotive haulage being used from July 1837 until then.¹⁷⁷

Figs. 2.126 to 2.128 show the deck of the Regent's Bridge by which the canal was crossed. This bow-and-string bridge over the canal was required to give clearance for boats and is an early example of this type. It was unfortunately replaced in 1923. It was possibly designed by Charles Fox (1810-1874), and it was of particular interest to Brees, who devoted seven plates to it. (Compare Brees's plates with those which emanated from Stephenson's drawing office.) The bridge was regarded as

*one of the boldest specimens of construction on the whole line; the railway being entirely suspended by attached Rods, as shewn upon the several plates. We believe this is the first application of the Suspension principle to carry Locomotive Engines and Trains, as used upon a railway.*¹⁷⁸

In April 1837 Regent's Bridge caught Bourne's attention, which resulted in a tinted lithograph published around the time of the opening of the railway (Figs. 2.129 and

¹⁷⁷ Pater Darley, *Camden Goods Station* (Stroud, 2013) p. 17.

¹⁷⁸ Brees, 1838, p.xxi.

2.130). Beyond the bridge the train would have continued to the Stationary Engine. Bourne's illustrations show that construction was well under way in April 1837 (Figs. 2.131 and 2.132) with the tender for twin 60 horsepower condensing steam engines being accepted in July 1836 from Maudslay, Sons and Field and in use by October 1837. Figs. 2.88 and 2.89 shows locomotive haulage was in use from July 1837 until the stationary engine came into operation in October.¹⁷⁹

Bourne's view of the Stationary Engine (wash drawing and lithograph Figs. 2.131 and 2.132) appears to have been made from the canal bridge looking towards the Locomotive Engine House. The two chimneys to serve the boilers for the stationary engine are not yet built. Although the general framework for the stationary engine is apparent it has a long way to go. However, the centring for the 20-foot driving wheel is clear and the housing running down to the canal with coal stores underway. This can all be rationalised with Fig. 2.133 which shows only one engine was installed and that to serve the London and Birmingham Railway alone: the other half, which was intended for Great Western would have been on the west side but with their move to Paddington, construction was abandoned. The boilers were retained with the chimney.

The operation of the incline can be gleaned from a combination of Fig. 2.134 (lithograph Fig. 2.135) and Fig. 2.136 (lithograph Fig. 2.137). In the former a locomotive stands waiting for a train coming from the direction of Euston, this having been hauled up by the Stationary Engine. In the foreground the points have been set ready for the loaded train to continue towards Birmingham. In Fig. 2.136 another locomotive waits ready to go on duty. In Fig. 2.137 (the lithograph) the action has been enhanced by the inclusion of a pointsman and the detail of the locomotive.

A detail concerning the point work is of interest. Not only do the illustrations show Bourne's meticulous concern for detail but are also a little-known record of the point work itself designed by the talented engineer Charles Fox.¹⁸⁰

¹⁷⁹ Darley, 2013, p. 17.

¹⁸⁰ Patent 7773 (Andrew Dow, *The Railway: British Track since 1804* (Pen & Sward, Barnsley, 2013), p.71-2).

Various myths have circulated regarding the use of locomotives on the incline. One suggests that they were not permitted; in fact, they were expressly allowed. 'That no Steam Engine (locomotive Engine excepted), Foundry, Forge, Manufactory, or Brewery of any Kind shall at any Time or Times hereafter be erected or used'.¹⁸¹ Certainly, there were objections to the smoke from locomotives. This was overcome by insisting that the 'Boiler of every stationary or locomotive Steam Engine ...shall be constructed upon the Principle of consuming its own Smoke,'¹⁸² presumably this refers to the use of condensing engines.

Another myth was that locomotives were not powerful enough to surmount the incline. This also has been shown to be inaccurate. Lecount's synopsis of locomotives working on the incline states that locomotives worked 'until the fixed engine is ready'.¹⁸³ Furthermore, I have confirmed that locomotives were used on the Euston Extension before the Stationary Engine was built (Figs. 2.88 and 2.89).

However, there were undoubtedly problems with working the incline with standard locomotives: otherwise, why was the Stationary Engine installed? Regardless, the Stationary Engine had its own problems. These proved surmountable until 1844 with much of this described by Dockray.¹⁸⁴ However this was not the full story:¹⁸⁵

Upon trial it was found, that the locomotive engines could surmount the inclined plane between Euston and Camden Stations with the ordinary trains, and that with the assistance of a second engine, the heavy trains could also be passed to Camden Station. A saving of ten minutes in time was the result, as well as economy in the cost of working the stationary engines and inclined-plane rope. After numerous successful trials, the engines and rope were, in April 1844

¹⁸¹ 5 & 6 GuI. IV. Cap. lvi LIX.

¹⁸² 5 & 6 GuI. IV. Cap. lvi. CXCVII.

¹⁸³ Peter Lecount, *A practical treatise on railways, explaining their construction and management... being the article 'Railways' in the seventh edition of the Encyclopedia Britannica, with additional details* (A. C. Black, Edinburgh, 1839), p. 207.

¹⁸⁴ R. B Dockray, 'Description of the Camden Station of the London and North Western Railway', (*Minutes of the Proceedings of the Institute of Civil Engineers* 1849 pp.165 – 173).

*abandoned, and in course of time the stationary engines were sold, and they are now doing duty in a flax-mill in Russia.*¹⁸⁶

2.13 Summary of Bourne's Contribution

This chapter has brought out some valuable points regarding Bourne's ability to absorb small detail and reproduce them in ways that were convincingly accurate and not overstated. These he applies within the contents of the larger image that assures the viewer of a real feature. Such are his inclusions of a minute detail, that dates can be inferred for progress in building as can details about the design and construction of the line. His genre sketches, preserved in the Elton Collection, were made from life and were absorbed into the tinted lithographs. They allow the historian to animate the Sublime heavy industry on the Euston Extension.

On a larger scale Bourne's images are supported by engineering drawings of the same subject and can be compared with other contemporary artists. Although not intentionally technical, their comparison with other more technically intended drawings confirms our knowledge of constructional procedures: such as at Primrose Hill Tunnel and the building of the cut and cover tunnels at Parkway and Hampstead Road. The fact that Bourne's wash drawings are dated adds further trust.

Few wash drawings from the Euston Extension were selected for conversion into tinted lithographs for Bourne's *Drawings*. This makes the point that Bourne's personal preferences varied from Britton's motives and understanding of what was commercially viable. Although Bourne's *Drawings* are seen today as a railway genre, it was only under Britton's influence that such a landscape genre was developed.

2.14 Chapter Conclusion

This chapter provides a detailed analysis of the relationship between construction of the Euston Extension and Bourne's recording of this activity. His work, both

¹⁸⁶ In fact, it remained in use for a few more months - 'Friday: July 12, 1844. 'On and after Monday next the use of the rope will be wholly discontinued, and all the trains taken from Euston by the locomotive engines. '(Signed) H. P. Bruyeres.' Quoted in *Life of Robert Stephenson*, by John Cordy Jeaffreson. With descriptive chapters on some of his most important professional works by William Pole (Longmans, London 1866), Vol. 1 p. 208.

published and unpublished, provide us today with a detailed record of the construction process. Bourne's work also can be compared with those produced by his contemporaries to contrast styles and artistic priorities.

The novelty of the railway then edging its way towards the City attracted a mixed-bag of artists, ranging from Scharf's sketches to the Picturesque watercolours of Schnebbelie. Bourne's wash drawings accurately captured the atmosphere of the massive undertaking involved in creating the railway. He also had an eye for detail. That skill helps us identify engineering innovations, such as the use of iron girders and the development of permanent way. Matters such as the extent and accuracy of depictions of technical detail were approached in different ways by different artists.

Indeed, Bourne's attention to detail and certain elements of his depiction of impact did not immediately fit into Britton's political agenda. Adaption was required. In this chapter, I demonstrate some of that adjustment and accommodation towards Britton's priorities. As a result, I argue, it is essential to combine our archaeological and aesthetic interests in Bourne with a clear understand of Britton's motivations and investments in the publishing project that was *Drawings*. It is not simply a folio of tinted lithographs. It is a work of advocacy trying to depict the railway as a new natural element of the British landscape.

Chapter 3: Aesthetics and Layout in Bourne's Wash Drawings and Tinted Lithographs

3.1 Introduction

In Chapter 2, I presented the railway as its builders ploughed their way through the landscape, and I used Bourne's illustrations, and those of others, to uncover underlying specifics in the engineering. Although well suited for this purpose, many of Bourne's wash drawings were not suitable for Britton's political purpose. As a result, they were omitted or altered for *Drawings*.

While Chapter 2 was more concerned with the extraction of technical content, the main thrust of Chapter 3 concerns aesthetics: the manner of creating 'effective and interesting pictures'. The specific focus is on the 'period taste' towards landscape and how it evolved ultimately to accept 'the unpromising subject of a railway'.

Bourne's *Drawings* offered far more to its audience than mere curiosities or railway memorabilia. Instead, it presented a distinct genre of artwork. In this chapter, I argue railways fit in, as a type of landscape architecture, as a continuance of eighteenth-century scenery theories. By absorbing inherited aesthetic movements, Bourne produced images which portrayed the railway as a mixture of Picturesque and the Sublime, depending on the nature of the subject or purpose. In this chapter, I compare Bourne's work with other artistic approaches made of the railway, arguing for contrast in purpose and aesthetic.

In this chapter, I also describe the logistics by which material was gathered by Bourne and later adjusted to suit the political aims pursued by Britton. In the process of adapting his work for Britton, Bourne made aesthetic innovations and added new media to railway illustration. For example, by adapting James Duffield Harding's developments in tinted lithography publication.

Success was not guaranteed for Bourne. A great deal of money was at stake. To test the market, Bourne published his railway illustrations first through four issues of a

small number of prints each, then combined and expanded his work into a prestigious volume of over thirty tinted lithographs, combined with an essay from Britton. The publication logistics for this strategy is reconstructed in the tables of Appendix 1. Appendix 1 also contains a full record of the wash drawings and tinted lithographs.

3.2 Lithography Struggling for Status

In Chapter 1, I argued tinted lithography became an accepted medium and found a growing regard following Harding's (1836) *Sketches at Home and Abroad*. This appeared at just the time that Bourne set foot on the railway excavations in Camden. Soon after Bourne's (1839) *Drawings*, tinted lithography became more established. A strong example was Robert Hay's *Illustration of Cairo*, published in 1840. Bourne provided the lithographic work. The technique had to win approval of the art establishment. In most respects this was in the hands of the Royal Academy of Arts. Not only did this body dictate artistic taste but also the medium preferred. Whatever Bourne's talent and abilities, his profession as an engraver would have precluded him from becoming an Academician. Though engravers were admitted as Associates from 1769, they could not stand for election as full Academicians until the genre was fully accepted in 1853. The status of lithographers was even more doubtful as lithography was not invented until after the founding of the Royal Academy.

The struggle for the admission of engravers as full Academicians was long-fought. John Landseer ARA (the father of Sir Edwin Landseer) was one who was constantly knocking at the door of the Royal Academy. In 1807 he published a series of lectures given by him at the Royal Institution.¹⁸⁷ Knowing many Academicians practised lithography, one can assume that as an artistic discipline it crept in by the backdoor. Examples included Academicians such as Henry Fuseli and Benjamin West (one-time RA president), and on the continent, Francesco Goya, Théodore Géricault,

¹⁸⁷ *John Landseer ARA, Lectures On The Art Of Engraving, Delivered At The Royal Institution Of Great Britain, By John Landseer, Engraver To The King, And F.S.A.* (London, 1807). Celia Fox has brought this story up to date in Celia Fox, 'The engraver's battle for professional recognition in early nineteenth-century London', in *London Journal*, 2 (1976).

Eugène Delacroix and Frederick Schinkel.¹⁸⁸ In Bourne's time, lithography was slowly becoming acceptable. The ease with which it could be transferred from the original drawings was a great advantage giving verisimilitude to any subject produced *en plein air*.

3.3 Integration of Railways into Landscape

Topographically, engineering of the railway was directed towards creating as level a course as possible. As locomotives became more powerful the ruling gradient could be modified, but engineering of the London and Birmingham Railway demanded moderate gradients. These required radical changes to the landscape.

In reality, these engineering changes were simply the next in a long line of transformations of land and use for British rural geographies. The continuing flux giving the appearance of a 'disguised countryside'.¹⁸⁹ Put alternatively, the landscape was a succession of 'organic' layers which can be unfolded layer by layer like an 'historical palimpsest'.¹⁹⁰

In the imagination of British landed gentry, however, rural geographies often were treated as the opposite: stable, permanent, pristine, and untouched. Bourne's brief became one of integration. As the newest layer, the radical changes brought by railways needed to be blended into the pre-existing, durable, pristine landscape.

Regarding the 'canon of art', landscape art and history painting have long competed to rank as the pinnacle of genre. Landscape was recognised as a genre in Reynolds's (1778) *Discourses*.

There seems no branch of the Art that admits of every embellishment so much as Landscape; a scene in the hands of one man forms but a mere map or topographical view, while rendered by

¹⁸⁸ *The Romance of the Stone: Lithography, 1796-1825* (New York Public Library 16th September-11th January 1997).

¹⁸⁹ Gillian Tindall, *The Fields Beneath* (Eland Books, 1977).

¹⁹⁰ 'William Boyd: rereading The Making of the English Landscape by WG Hoskins' (*Guardian* 11 May 2013).

*a poetic pencil it assumes an elevated rank, and moves the mind
with its beauty or sublimity.*¹⁹¹

In Reynolds's *Thirteenth Discourse* he elaborates on 'poetic rendition' by stating that the artist likes 'to dress the [landscape] according to the principles of their own art.'. This clearly implies that the same subject might be treated differently depending on the artist, purpose and medium used and their relationship. It also begs the question whether the accuracy of detail which a railway demands, detracts from art or art obscures accuracy.

This in mind, I shall illustrate my argument about Bourne's work to assimilate railways into landscape through the use of a single structure and a variety of approaches and purposes: from engineering drawings to art *per se* and prints. For this, the iron bridges by which the railway crossed the Grand Junction Canal at Nash Mills and Pitstone (Figs 3.1 to 3.11) provides the case study.

3.4 Aesthetic Comparison: Iron Bridges over the Grand Junction Canal

At Nash Mills and Pitstone skew bridges were built in such a way as to provide straight courses for the railway while maintaining wide access for the canal (Figs. 3.1 and 3.9). The use of lattice ironwork was yet another innovation of Charles Fox which, in this case, allowed for duplication elsewhere.

I discussed the origin and fate of relevant drawings from Robert Stephenson's Drawing Office in Chapter 1. No doubt Brees (Fig. 3.4) had access to those drawings, and therefore was able to show one of the bridges under construction with scaffolding in place. This can be followed through on Bourne's wash drawing (Fig. 3.5) with remnants of scaffolding still apparent, echoing Brees. There is a touch of truth in the gap left by the balustrade where it would join up with the abutments on completion (see Fig. 3.2 for detail). Furthermore, the shadows cast by the scaffolding again add greatly to the verisimilitude.

The lithograph (Fig. 3.6) based on the wash drawing, although doctored to show the completed bridge, is a faithful copy. Judging from the comparable sizes, the

¹⁹¹ Sir Joshua Reynolds, *Seven Discourses delivered in the Royal Academy* (London 1778), p. 68.

drawing was transferred directly onto stone in Bourne's established method. However, a few figures have been added to give a more Picturesque effect. These do not detract from the engineering accuracy. However, it can be debated which leaves the greatest artistic impression. Possibly the archaeologist would find Fig. 3.5 the most accurate, but when the others are added one has a composite, perhaps 'complete' picture.

Schnebbelie's watercolour (Fig. 3.7) is much in the style of Bury (Fig. 3.8) in its view, and one wonders if one or the other made copies. However, the use of watercolour is rather more pleasing, adding to its 'Picturesque' quality observable in the sky that suggests the influence of Constable.¹⁹² Such theatrical appendages as sky and the inclusion of a 'supporting cast' are typical Picturesque additions.

Bury's aquatint (Fig. 3.8), published at around the same time as Bourne's wash drawing, is by comparison naïve or even primitive. It is manipulated for effect, such as that of a train crossing the bridge. However, the inclusion in the foreground of country-folk and masonry left over from building work has a ring of truth in the spirit of Scharf and Ackermann and was probably intended to heighten the Picturesque effect. The inclusion of a large-wheeled cart may have had a similar purpose to that shown in Figs. 2.80 and 2.81 for carrying the iron members to their final location.

The engineering drawing for Pitstone (Fig. 3.9) contains the characteristics of Bourne's work but in reverse (Fig. 3.10). It seems likely that this was intended to be used in conjunction with the engineering drawings for both bridges. Bourne's wash drawing is more of a pleasing Picturesque sketch, but it contains all the detail required for the tinted lithograph (Fig. 3.11), drawn on stone to the same size. Performed in October 1837 among six wash drawings produced at the end of the campaign, it has the appearance of haste as with *Blasting rocks, Linsdale October 1837* (see Appendix 1 Table 3).

Although Bourne, and the other artists, appreciated the artistic qualities of bridges, there were mixed views on the appearance of iron bridges in themselves. Lauder (1842), writing a few years after Bourne, was a critic. In limited terms, he recognised

¹⁹² Mark Evans, *Constable's Skies: Paintings and Sketches by John Constable* (Victoria and Albert Museum, 2018).

that some considered those ‘which have the greatest number of parts, and these parts thin and fragile looking. If intricacy of construction be considered by some as an ingredient that constitutes beauty’. (Lauder sounds as if he had our two bridges in mind.¹⁹³) However, he considered the solidity of the Roman arch had superiority over the lightness of the iron-framed bridge. In a sense it is the very ‘intricacy of construction that constitutes beauty’.¹⁹⁴ In this disagreement one begins to see the lightness of Picturesque against the heavy masculinity of the Sublime.

3.5 Towards a Railway Genre

The rapid expansion of railways was accompanied by a thirst for railway illustrations (see Chapter 1). As I have intimated Bourne’s tinted lithographs were aimed at a specific audience, one that could afford bound volumes costing over £4. It was thus that the ‘strong meat’ produced by Bourne *con amore* of the Euston extension were not selected for transfer into tinted lithographs. These were probably rejected by Britton whose long experience of the taste of the target group felt that they would not fulfil its expectations.

One purpose of this chapter is therefore to explore why such alternative aesthetics became acceptable alongside the better-established genre of landscape painting *per se*. Inevitably aesthetic views on the landscape and its portrayal were not necessarily constant but, for the sake of application here, were related to the epoch, nationality and environment in which observed and therefore subject to changing circumstances. It can therefore be argued that elements of a previous period filter through as a part of the platform for the growth of the next ‘aesthetic’ whilst still maintaining their English background. In simple terms ‘taste’ for social, political and economic reasons evolves rather than being statically inflexible. It is for these reasons that railway art, in terms of Bourne’s portrayal had evolved through a

¹⁹³ Lauder chimes with today’s view which considers them ‘outstanding cast-iron arch bridges sadly replaced during electrification in the 1960s,’ see National Heritage Protection Plan 4B3 RPS group Historic Railways and Structures-10 Cast Iron Bridges.

¹⁹⁴ Thomas Dick Lauder, Sir Uvedale Price, *On the Picturesque: with an essay on the origin of taste, and much original matter* (Edinburgh 1842), p.377. See also Paul Dobraszczyk, *Iron, Ornament and Architecture in Victorian Britain: Myth and Modernity, Excess and Enchantment* (Ashgate 2014) on the philosophy of iron decoration in railways.

number of landscape phases to arrive at being suitable for portraying the particularly English invention of the railway in an English landscape tradition.

3.5.1 *Origins of English Landscaping*¹⁹⁵

As early as 1712, the desirability of a 'cultivated' landscape was being questioned by Joseph Addison.

*There is something more bold and masterly in the rough careless strokes of nature than in the nice touches and embellishments of art [formality]. The beauties of the most stately garden or palace lie in a narrow compass, the imagination immediately runs them over, and requires something else to gratify her; but in the wide fields of nature the sight wanders up and down without confinement, and is fed with an infinite variety of images without any certain stint or number.*¹⁹⁶

To Addison, it was then the appeal of variety found in the 'Irregularity in my Plantations, which [were allowed to] run into as great a Wildness as their Natures will permit'. This sense of freedom and irregularity was picked up by William Hogarth in his *Analysis of Beauty* published in 1753.¹⁹⁷ In this the 'Line of Beauty' with its variety of curves was an important ingredient in his art theories and reappears, as we shall see, in the Picturesque.

Pope followed Addison with his *genius loci* concerning the preservation of the integrity of a location which echoes Addison's view on the freedom 'as ... Nature will permit.'¹⁹⁸

*To build, to plant, whatever you intend,
To rear the Column, or the Arch to bend,*

¹⁹⁵ For general comments see Malcolm Andrews, *The Search for the Picturesque* (Stanford University Press, 1989), 'The Evolution of Picturesque Taste', p. 39-66.

¹⁹⁶ *The Spectator* N° 414 (June 25, 1712) and 477 September 6. 1712.

¹⁹⁷ William Hogarth, *Analysis of Beauty* (London 1751).

¹⁹⁸ Alexander Pope, *An epistle to the Right Honourable Richard, Earl of Burlington* (London 1831) first published 1732.

*To swell the Terras, or to sink the Grot;
In all, let Nature never be foreot.
Consult the Genius of the Place in all,*

Of course, as far as we know, Addison's and Pope's observations were theoretical and not necessarily dictates for land management. For instance, the interests of agriculture required otherwise, and these lay in the hands of the landed gentry whose agricultural reforms ran parallel to other landscape discussions.

3.5.2 Bringing Order to Landscape

The answer to more efficient land management was met by Enclosure Acts in which some 70 million acres of agricultural land were rationalised. Under such measures open fields disappeared and boundaries installed defining ownership: such organisation brought with it unwelcome social change among the country folk with the result that there arose the need for presenting a better image. This was met by landowners commissioning paintings which disguised the truths of the agricultural workers' conditions. Such was George Stubbs's picture 'Reapers' (Fig. 3.12) which romanticised the enclosed land as one of cooperation between agricultural workers, overlooked by their mounted employer reaping the harvest. Its pendant (Haymakers) shows a hay-cart with men and women loading as if celebrating the ancient festival of Harvest Home.

The covert and subtle evidence presented by Stubbs are indicative of how pictures can be used to manipulate fact such as here by masquerading as pastoral or even rustic. This might be seen as the premise for the adoption of Bourne's approach for the depiction of what was 'the unpromising subject of a railway'.¹⁹⁹ In this way it could be viewed both as celebration and nationalism.

However, the compulsory powers given by Enclosure Acts set a precedent for an increasing number of other Acts of 'improvement'. Such scene setters for railways were linear and included turnpikes and canals which were by their limited disruption seen as being adjuncts to country life and popularised by such as James Pollard's

¹⁹⁹ *Gentleman's Magazine* 1838, p. 419.

coaching pictures, mentioned in Chapter 1 (Fig. 1.13). In many respects the early horse-drawn railways were similar to other linear transport systems and welcomed as aiding landowners. In fact, it was often they who were the promoters.

3.5.3 Landscape 'Improvements'

The first public railway was built under an Act as the Surrey Iron Railway of 1801. Authorised at the time of the build-up to the French Wars it can be seen as a nationalistic project in much the same way as agricultural improvements: but in this way making an honest statement of intrusion into the landscape. In Fig. 3.13 one therefore sees a different approach to the justification seen in Stubbs. This loudly proclaims the imposition of the railway: that is the benefits of railways in which engineering is shown as being advantageous to the general population through the distribution of coal as a symbol of national wellbeing at a time of continental war.

This opportunity for the successful reorganisation of agriculture by the landed gentry suggested alternative 'improvements' which were non-agricultural but still required wholesale reorganisation of the landscape. Made as they were from such experiences as those gained on the Grand Tour: lakes and hillocks were created, classical features in imitation of temples erected and grottos dug as classical references. Thus a new breed of landscape architects such as William Kent (1685-1748), Lancelot Brown (1715-83) and Humphry Repton (1752-1818) were established. In some respects one can see the re-formed landscape with the addition of buildings as a kind of dress rehearsal for railways.

However, it was not only the re-creation of the Ancient world that motivated these changes but the paintings by such as Claude Lorrain (1600-82) (Fig. 3.15). It was through these that the act of landscaping and landscape painting were symbiotic.

At Stowe these were also combined in patriotic terms 'By Commerce, Albion and by Arms refin'd/. Sought for the Charms of Art and Nature join'd'.²⁰⁰ It was here that William Kent (1685-1748) combined classical features with a patriotic gesture of a Temple to British Worthies (Fig. 3.14).

²⁰⁰ *Stowe: a description of the magnificent house and gardens of the Right Honourable Richard Grenville Temple, Earl Temple, Viscount and Baron Cobham* (London 1773).

From 1774 the influence of Claude became more widespread following the publication of his *Liber Veritatis* with its 200 mezzotints by Richard Ealom (Fig. 3.15) and published by Boydell.²⁰¹ Although these could provide a 'pattern book' of examples which could be applied or modified to those with the collective taste of those who had made the Grand Tour it was also an inspiration to landscape art.

There was then a particular Englishness that grew up around the snobbery of the classics combined with continental travel. However, towards the end of the century this was to change as Continental travel was put on hold and the fashion for the English Landscape Garden on the wane. However, such reorganisation, including the movement of whole villages, had application for what was to follow with the building of railways.

3.5.4 Turner's Landscapes - Interregnum

Although there was a decline in the popularity of the creation of vast landscape in the classical tradition, that for Claude was carried forward by the publication of Turner's *Liber Studiorum*. Begun in 1806 and published as a *potpourri* of etchings and mezzotints between 1807 and 1809 it was a typical example of Turner's career built on producing topographical views for print publication.²⁰² It was this production of multiple illustrations that brought in the coterie with whom Bourne and Britton were associated. One was John Pye, under whom Bourne had trained, who engraved Turner's *Pope's Villa*, (Fig. 3.16) for John Britton's 'The Fine Arts of the English School' (Figs. 3.17).²⁰³ There were also loose connections with Charles Heath who

²⁰¹ [Earlson] *Liber Veritatis; or A Collection of Prints after the original designs of Claude le Lorrain; in the collection of His Grace the Duke of Devonshire. Executed by Richard Earlom in the Manner and Taste of the Drawings 1777.*

²⁰² Sam Smiles, 'Picturing Places' (British Library). 'Turner's topographical watercolours'.

²⁰³ John Britton, *The Fine arts of the English school, illustrated by a series of engravings from paintings, sculpture and architecture of eminent English artists* (London, 1812), pp. 19 and 20. John Britton from JMW Turner, November 1811, in John Gage (ed.), *Collected Correspondence of J.M.W. Turner* (Oxford: Clarendon Press, 1980), p. 50. Also, *Notes and memoranda respecting the Liber studiorum of J.M.W. Turner, R.A.*, written and collected by the late John Pye. Edited, with additional observations, and an illustrative etching, by John Lewis Roget (London 1879). *A catalogue of the collection of prints from the Liber studiorum of Joseph Mallord William Turner / formed by*

published Turner's *Picturesque Views of in England and Wales* available from 1827 which went on as watercolours until full publication in one volume in 1838 in which engravings of the industrial Sublime were included (Figs. 3.18 and 3.19): noticeably the *Picturesque Views* chimed with the publication of the London and Birmingham Railway.²⁰⁴ In this one can suggest some common element that drove them in the same direction. Of course, they had association in common and it would have been hard to escape what was going on in one's own profession. Such was the influence of the Picturesque and the Sublime.

In Figs. 3.16 and 3.17 we see much that lies behind Bourne's wash drawings and tinted lithographs which follow the decline of the English Landscape Garden. This was markedly expressed by John Britton in 1801.

One of the proprietors of Stourhead, indeed, thought it good taste to make the grounds as artificial as possible, and to crowd them with temples, obelisks, and bridges. He absurdly adopted the fashions of Italy and France; either forgetting that our climate was dissimilar to that of a more southern hemisphere, or disregarded its effects. He therefore threw a Chinese bridge across the water; raised a temple of Apollo on one spot, a temple called the Pantheon, in another; whilst a third, dedicated to Flora, was placed on the bank of the lake in a different situation: and besides which there were grottos, caves, &c. Thus embellished and thus finished, we can easily fancy what would be the appearance and effect of such combinations.

Instead of rural simplicity, and the chastened wildness which are now studied in 'landscape gardening,' everything reminded the spectator, of art, of Italian skies, and of foreign associations. Though some of these objects are still retained at Stourhead, yet many have been removed; and instead of expelling nature from the place, or

the late Francis Bullard, of Boston, Massachusetts, and bequeathed by him to the Museum of Fine Arts in Boston (Boston 1916).

²⁰⁴ J. M. W. (Joseph Mallord William) Turner, (1838). *Picturesque views in England and Wales*. (London: Longman, Orme, Brown, Green, and Longmans. Published 1827-38).

*confining her in the letters of formality, she is allowed to flaunt through the groves and parterres. Art, however, is retained to accompany her in the most frequented paths, and to regulate her movements, and restrain her within the boundaries of propriety and pleasantness.*²⁰⁵

The labouring of his dislike of the 'continental' flavour came at a time when the French Wars were underway. However, Britton's real issue was with landscape design, and it is clear that he favoured that which was 'rural simplicity, and the chastened wildness' which tended towards those of Addison and Pope. However, it was the combination of the 'now studied landscape gardening' and dislike of 'absurdly adopted fashions of Italy and France' that was driving landscape art in the direction of the Picturesque which also had a bearing on the Sublime as an addendum difficult to avoid where Bourne's railway was concerned. In this we must take Britton seriously as the driving force behind the artistic agenda for the London and Birmingham Railway as well as the driving force behind the political discussion.

3.5.5 Contrasting Picturesque and Sublime

Both the Picturesque and the Sublime had their origins in the eighteenth-century writings of Edmund Burke (1729-97).²⁰⁶ His theories can be summarised as a continuum with the Sublime at one end with the beautiful at the other. The Picturesque would lie somewhere in between depending on the strength of the degree to one or the other - Sublime or Beautiful. For example, one might see Figs. 3.16 and 3.17 as being inclined more to the Beautiful than Figs. 3.18 and 3.19 which has a quality nearer the Sublime. As applied to our railway Fig. 3.20 by Schnebbelie, Figs. 3.21 and 3.22 by Bourne and of the same subject have Picturesque qualities to varying degrees. The introduction to a recent exhibition at the Royal Academy provides hints of this variety and more - 'the Beautiful, the Sublime and the Picturesque informed a radical transformation of landscape painting...into truthful

²⁰⁵ Britton, *The Beauties of Wiltshire* 1801) p. 289.

²⁰⁶ Burke, 1757, 'On the SUBLIME'.

records of specific locations imbued with emotional, moral and religious resonance.²⁰⁷

It was through such tactics that Bourne was able to make the railway suit a variety of moods and approaches that produced 'effective and interesting pictures'. However, why did such alternatives present themselves? The reasons can be tied to that of 'period taste'. For instance, continental travel had been put on hold and a home-grown landscape art substituted whose content was that of the Picturesque found in the British landscape. Equally present was patriotic fervour manifested through industry and agriculture in which the former allied itself with the 'Sublime' whilst agriculture was taken care of through enclosure and the Board of Agriculture (1793 to 1822) in the capable hands of Arthur Young (1741-1820).

It was then through the Picturesque that the kernel of rebellion against the manipulated landscape lay. In this one might assume that the engineering of the railway was the antithesis. However, unlike the upheaval caused by the Kent, Brown and Repton landscapes the intrusion of the railway was a matter of degree-that is as already stated a railway which blended into an established landscape or put alternatively, a landscape with railways rather than a railway landscape.

This was not too far removed from the objectives of the pioneers of the Picturesque. Starting with William Gilpin (1724-1804) he was joined by Uvedale Price (1747-1829) and Richard Payne Knight (1751-1824).²⁰⁸ Knight blasted off with his didactic poem in which he called Capability Brown a 'meagre genius of the bare and bald' and invited his followers

*Thy spade and mattock here at length lay down,
And follow to the tomb thy favourite Brown:*

²⁰⁷ 'Constable, Gainsborough, Turner ... (Royal Academy).

²⁰⁸ William Gilpin, *Observations on the River Wye and several parts of South Wales, &c.: relative chiefly to Picturesque beauty, made in the summer of the year 1770* (1782). Uvedale Price, *An Essay on the Picturesque as Compared with the Sublime and Beautiful* (London 1794). Richard Payne Knight, *The Landscape: a didactic poem in three books: addressed to Uvedale Price* (London 1795).

*Thy favourite Brown, whose innovating hand
First dealt thy curses o'er this fertile land;*²⁰⁹

Knight also found commonality with Addison's sentiment that 'I take in none that do not naturally rejoice in the Soil' by the retention of trees 'which nature's hand has sown'.²¹⁰ Whilst appealing for Britton's 'rural simplicity' he also asked for a 'chastened wildness' through avoiding the boredom inherent in a landscape 'wrapt all o'er in everlasting green/ Makes one dull, vapid, smooth, unvaried scene'.²¹¹ It is in the plea for a modified wildness and avoidance of the dull and lack of variety that made the railway a suitable subject for the Picturesque. It was almost as if Bourne was moved to take advice and liven up Fig. 3.23 and 3.24 by adding cattle and a coach approaching the bridge in a second state published a month later (Fig. 3.25). One could suggest that Figs. 3.23 (3.24) were in Burkian terms 'beautiful' but in Fig. 3.25 'Picturesque'.

By the 1790s Gilpin extended his theories by stating that 'A piece of Palladian architecture may be elegant in the last degree [and] the whole may be highly pleasing ... if we introduce it in a picture, it immediately becomes a formal object, and ceases to please'. He follows this with his famous quote:

*Should we wish to give it Picturesque beauty, we must use the
mallet, instead of the chisel: we must beat down one half of it,
deface the other, and throw the mutilated members around in heaps.
In short, from a smooth building we must turn it into a rough ruin.*²¹²

Appropriately Bourne images fitting these remarks can be found in Figs. 2.10 and 2.51 and those rejected from the Euston Extension (see Appendix 1 Table 3 Part 3).

Regarding the application to a picture itself, Gilpin states:

²⁰⁹ Knight, 1794 lines 200 - 303

²¹⁰ Knight, 1794 lines 37-40.

²¹¹ Knight, 1794, line 285.

²¹² William Gilpin, *Three essays: on Picturesque beauty, on Picturesque travel, and on sketching landscape: to which is added a poem, on landscape painting* (London, 1794), 2nd edition, p. 7.

Again, why does an elegant piece of garden-ground make no figure on canvas? The shape is pleasing; the combination of the objects, harmonious and the winding of the walk in the very line of beauty.^[213] All this is true; but the smoothness of the whole, tho' right, and as it should be in nature, offends in a picture. Turn the lawn into a piece of broken ground: plant rugged oaks instead of flowering shrubs: break the edges of the walk: give it the rudeness of a road : mark it with wheel-tracks and scatter around a few stones, and brushwood; in a word, instead of making the whole smooth, make it rough ; and you make it also Picturesque.²¹⁴

Whilst not applying this advice directly one finds its spirit in Fig. 3.26 in which we have the broken ground, the ruggedness in the temporary bridge, wheel tracks in the form of rails, scattered stones and the whole is rough.

In this we find Bourne again drawn to similar subject matter as that favoured by him on the Euston Extension in which labourers are perched precariously on revetments (Figs. 2.54). Although too small to see the working group in the middle distance of Fig. 3.26 must similarly have required detailed drawings.

Like Gilpin, Price was concerned about the strict regularity of classicalism. He argued that 'no matter how elegant a piece of Palladian architecture [it is in reality] a formal object and excites only a cold admiration of the architect's ability; but, when introduced in a picture, becomes a highly interesting object, and universally pleases.'²¹⁵ In other words, if the setting is more rugged, then it takes on the Picturesque qualities or as Price continues 'Nay farther, we do not scruple to affect, that roughness forms the most essential point of difference between the beautiful, and the Picturesque'. In the building of the Euston Portico (Figs. 2.103 and 2.104) we see such qualities which were obviously attractive to Bourne.

²¹³ William Hogarth's 'line of Beauty' .

²¹⁴ Gilpin 1794, p. 8.

²¹⁵ Price 1794, pp. 396-97.

At Blisworth Cutting, we veer towards the Sublime as we move around geology which at that time was receiving a fair amount of interest around the ideas of William Buckland, who used to teach geology to his Oxford students from the train.²¹⁶ However, the interest arose as the result of engineering problems. These were based on a thick bed of clay which lay beneath a layer of rock. It was this water-holding clay which caused the problem which required the building of revetments which Simm's geological section (Figs. 3.27) show.

This also brought about fossil finds which were in part instrumental in furthering the study of geology.²¹⁷ In 1840 the British Association agreed to make grants towards collecting data exposed by cuttings on the numerous railroads in various parts of the United Kingdom.²¹⁸ In this, specific mention was made of finds in the Blisworth Cutting.²¹⁹ Bourne seems to have shown particular interest in geology there. For instance, Fig. 3.28 shows a section which would appear to have had little use other than to show the rock strata.

Again in Figs. 3.29 with 3.30 Bourne is more interested in the cutting which he later worked up into a lithograph with a narrative. This appears to be related to an impending rock fall which shows this propped up (Fig. 3.30). By making use of this Bourne's lithograph based on it introduces a train which has safely negotiated the hazard with a 'policeman' in attendance (Fig. 3.30).

Figs. 3.31 are another example of adjustments: this turns from a predominantly Sublime content into a family event. The preparatory wash drawing (Fig. 3.31) with its Bourne-type appeal shows a crane set among the general detritus of excavating a cutting. This he turns into the published lithograph (Fig. 3.32) in which the mood has completely changed to that of a group out for a stroll observing the wonders of

²¹⁶ William Buckland, *Geology and Mineralogy considered with reference to Natural Theology* (Bridgewater Treatise 1836).

²¹⁷ Charles Lyell, *Principles of Geology* first published 2 volumes 1830 to 1833 (John Murray London).

²¹⁸ The *Proceedings of the Geological Society of London.*, (v.1.1834-1845] 1840, p. 473 also p. 460.

²¹⁹ Michael Freeman, 'Tracks to a new world: railway excavation and the extension of geological knowledge in mid-nineteenth century Britain,' *British Journal for the History of Science*, 34 (1) 51-65 (2001). Freeman 1999, pp.53-55.

railway engineering and the benefits that the railway will bring. Furthermore, the treatment between wash drawing and lithograph is that of heaviness to light touch.

3.5.6 Sublime

In these geological scenes there is what approaches an invitation to enter the underground. Whilst in Chapter 2. I explored the ‘mechanics’ of tunnelling, in this chapter it is examined as aesthetic. The appeal is to enter into the realms of the Sublime.

Bourne fed this invitation to enter the underground through tunnel portals. Such was their appeal that our select coterie joined in Bourne’s wash drawing and lithograph (Figs. 3.33 and 3.34) with Bury (Fig. 3.35) and Schnebbelie (Fig. 3.36) in making a ‘picnic’ in the view of Watford Tunnel. Bourne’s view of the tunnel portal made in June 1837 lacks the classical pediment, but tripods are in place. Whilst practically ready to begin work they symbolically represent a pediment. Schnebbelie’s watercolour likewise lacks a pediment but by the time of Bury’s aquatint it is in place. However, the Sublime had a long history but was newly explored in the early eighteenth century by Addison in the ‘Pleasures of the Imagination’.²²⁰ By the mid-century the appeal of the subterranean was broached by John Dalton (1709–1763) in a descriptive poem addressed to ‘two ladies, at their return from viewing the mines’. As they break to the surface they are greeted with:

*WELCOME to light, advent'rous pair!
Thrice welcome to the balmy air
From sulphurous damp in caverns deep,
Where subterraneous thunders sleep,
Which is followed by the question:
But why explore that world of night
Conceald till then from female sight?*

²²⁰ *The Spectator: June 23 to July 3, 1712.*

Such grace and beauty why confine.

*One moment to a dreary mine?*²²¹

A few years later Edmund Burke (1729-97) offers an answer.²²² After defining the Sublime as analogous to terror he states that,

When danger or pain press too nearly, they are incapable of giving any delight, and are simply terrible; but at certain distances, and with certain modifications, they may be, and they are delightful,

In this one can sense that by 'certain distances ... certain modifications' one is removed from the Sublime experience. Such is the case with a number of Bourne's wash drawings in which we can observe the sublimity safely as 'a fiction ... that can be consumed from the comfort of an armchair'.²²³ It is in this way that our artists gathered around the tunnel mouths to brood but avoid the actual experience: in this the pediment was just window dressing to give a sense of classical security.

The precedent for Bourne's tunnel drawings possibly come from John Martin's mezzotints of Milton's *Paradise Lost*, published between 1824 and 1827 (Fig. 3.37) and therefore well within Bourne's time span.²²⁴ A factor of interest are Martin's town planning activities which chime with his Sublime interests (Fig. 3.38) at a time of cholera outbreaks. The spirit of Martin's work must have influenced Bury in his *Tunnel on the Liverpool and Manchester Railway* (Fig. 3.39) of 1831 and passed on to Bourne directly through Ackermann and Bury (Fig. 3.40).

Before moving to Kilsby Tunnel where Bourne produced some of his best-known works I tie-in the experience of passing through Primrose Hill Tunnel to classical hints as found in Fig. 3.37.

²²¹ John Dalton, (William Brownrigg) *A descriptive poem, addressed to two ladies, at their return from viewing the mines near Whitehaven* (London 1755).

²²² Burke 1757) 'SECT. VII'.

²²³ Linda Nead, *Victorian Babylon*, (New Haven and London, Yale University Press, 2005), p.57.

²²⁴ John Martin, *The Paradise Lost of Milton, with illustrations designed and engraved by John Martin* (London 1827).

*If, however, the traveller should prefer keeping his seat and closing the windows, which is certainly the most advisable plan, he will find himself suddenly, and without a moment's warning, plunged into worse than Cimmerian darkness, and hurried along through clouds of smoke and vapour; amid flying sparks, jarring atoms, rushing winds, and every sign of elemental strife; whilst stunning sounds, and a rattling, clashing din, form a hubbub than which what Satan heard in his flight through the realms of Chaos and Old Night could scarcely be more terrific. But let not the most timid traveller imagine that there is any real danger; for, although appearances are rather alarming, and the consideration that fifty feet of earth are suspended above him, is somewhat startling; yet if he will close his eyes for the space of a minute, at the end of that period he will find himself, like many thousands who have daily preceded him, safely restored to the pure air and the light of day.*²²⁵

In this lies the kernel of Burke's thesis on the Sublime: that is the anticipation of awe and how it can be recollected in safety. Such are Bourne's views of tunnels and the challenge of that dystopian landscapes which could 'grace the drawing-room table' from where it could be picked up to be safely 'consumed from the comfort of an armchair'.²²⁶

The high point of these is reached in the interiors of the Great Shafts at Kilsby Tunnel. In Fig. 3.40 an assemblage of workers, horses and a kibble confirm this as a centre of activity in July 1837. The shaft of light thrown on to the scene greatly enhances the scene as one which is 'truly Sublime'. In this we experience it as if having descended by a 'kibble' used to import materials. The inviting light beams down illuminating the navvies and the floor shows puddles. A major problem with the

²²⁵ James Drake. *Drake's road book of the London and Birmingham and Grand Junction Railways: being a complete guide to the entire line of railway from London to Liverpool and Manchester...: to which is appended the visitor's guide to Birmingham, Liverpool, and Manchester* (London: Hayward and Moore..., [1839], p.14.

²²⁶ *The Gentleman's Magazine* (September 1839), p. 291.

building of Kilsby Tunnel was the influx of water. This nearly led to cancellation of the tunnelling.

The so-called ventilating shaft (not illustrated here but see Table 3 Part 1 XXX) was served by a steam-powered winding engine (Figs. 3.41 and 3.42). In both the detail shown is remarkably accurate. Although the description that follows reads as if an archaeological report the wash drawings and lithographs are atmospheric as well as accurate and summarise Bourne's actual observations of a reciprocating steam engine at work.

The drive for this was through a single-acting atmospheric engine (also known as a Newcomen Engine) located in a vertical position in the wooden-clad building-steam was supplied from a haystack boiler just seen to the right which discharged gases into the chimney stack.²²⁷ The working stroke was downwards whilst the upward stroke was achieved by balance working through twin headgear-shown to advantage in Fig. 3.42. In other words, a rotative motion was maintained by one rope descending into the shaft via the sheave on the headgear (both Figs) whilst the other ascended on the other side by winding onto the drum-thus alternatively paying out and winding to and from the drum. The drum is seen with the connecting rod running up to the rocking beam which itself joined the other end of the vertical piston in the wooden-clad house.

Much more can be drawn out of the wash drawing but more so in the accuracy of the lithograph which includes a previously-drawn pulley (Fig. 3.43) and a wheel jack (Fig.3.44). One can add that in Fig. 3.45 the Newcomen Engine is hidden by being below the brickwork as the shaft head which grows upwards in stages. In fact, examination of Fig. 3.40 gives an idea of its growing height in comparison with the steam engine which remains at the same level. Considering that these were produced among seven drawings at Kilsby in around one week this is a remarkable study of machinery.

As with Fig. 3.41 accuracy and atmosphere are symbiotic in Figs. 3.46 and 3.47. The haze and general depression add greatly to the verisimilitude. As with Fig. 3.41 this

²²⁷ This was described in the subscription invitation of December 1838 as 'Engine and Head Gear in the Shaft to Kilsby Tunnel' (*The Architectural Magazine and Journal* 1838), pp. 609-611.

is a detailed study but in this case that of the pumping mechanism so essential for the completion of the tunnel. The pumps are in the foreground and the eye is drawn to the distant tall building which contains a beam engine which is connected to the pumps by wooden flat rods which move backwards and forwards and set on cast-iron rockers. This action works two T-bobs which act alternatively transferring the action at right-angles and so downwards by pump-rods to a sump where water is collected. Close by lies a windlass for drawing up the rods for maintenance purposes.

Despite the undesirability of the weight of an engine close to a shaft it seems possible that the sparse survivals shown in the foreground represent earlier attempts at pumping. On the left lies a squared surround divided into two compartments, in one of which lies a gearwheel. The other may have contained a flywheel which would have lain on a common shaft with that of the gearwheel. A crank on the gearwheel would have joined a connecting rod emerging from one end of a beam engine. There is clear evidence of a wrought-iron boiler for raising steam. Whilst they add interest to the foreground, they are actual detail.

Together the Kilsby Tunnel experience provides a narrative in which a tunnel shaft looks up to the surface where a steam engine links back to the underground. On the surface a beam-pumping engine in the distance sends off a reciprocating action which pumps out the water which threatens the whole engineering project. These three are then symbolic of engineering achievement.

Having reached the aesthetic extremes of the Sublime it seems as if Bourne was trying to recover the pastoral nature of the ever-changing landscape: or, if one likes, removing the palimpsest of the Sublime whilst giving a departing wave to the tunnel portal through the last of the working shafts (Fig. 3.48 and the lithograph 3.49) as a strolling couple wander down the track towards the Picturesque beyond.

3.5.7 Gothic as a Corollary to Sublime

Although somewhat obscure - and discussed in more detail in connection with the Sublime - Britton's introduction of geology heralds that which was to impact on Charles Darwin's *Origin of the Species* in 1859. However, in this section we can

recall that Britton's ecclesiological interests tended towards the Gothic; hence, as we saw in Chapter 1, he was championed by the Ecclesiologists.²²⁸

The date of the founding of the Gothic-minded 'Ecclesiologist' in 1839 chimes with Bourne's Figures 3.50 and 3.51 of Rugby Railway Bridge which was one of the later illustrations commissioned: probably because of Britton's particular interest in Gothic architecture found in his Cathedral series which were completed in 1835.²²⁹

Furthermore, around the time it was described as follows:

*It consists of a flat gothic arch of cast iron, with ornamented spandrels abutting upon octangular towers of brick, with stone dressings, beyond which on either side are three smaller arches of brick, with buttresses between them, and the whole is surmounted with a parapet wall standing upon a bold stone moulding, which is carried through the whole length of the bridge. It is a beautiful specimen of workmanship; but the effect would probably have been much heightened if pinnacles had been placed on the tops of the buttresses, thereby breaking the long line of parapet wall at that part which, in some degree, at present offends the eye.*²³⁰

The use of iron (Fig. 3.53) allowed for a skew bridge (Fig. 3.52) to be used and the 'flat gothic arch of cast iron' in the latter. At the time of its building the interest in the style of bridge is borne out by the following:

the extra cost to the Company would not have been great, especially as it is reported that the Trustees of Rugby School, -- which stands not far distant, - contributed £1000 towards its erection, in order to preserve the style of architecture of their own foundation.

²²⁸ *The Cambridge Camden Society* founded May 1839 for 'the study of Gothic Architecture and of Ecclesiastical Antiques'.

²²⁹ John Britton, *Cathedral Antiquities of England* (14 vols, 1814-1835, London).

²³⁰ Thomas Roscoe, *The London and Birmingham Railway with the home and country scenes on each side of the line* (London 1839), pp. 311-12.

At the time, Dr. Thomas Arnold was Headmaster (1828-41) and known to have been opposed to Ecclesiology which throws some doubt on the style of the bridge being based on Gothic with its Tractarian connections. However, an alternative influence on its style might have been Sir Walter Scott's 'Abbotsford'. However, whatever the case it seems that the Tudoresque/Gothic caught on for railways and was adopted by Brunel for the front of the terminus of the Great Western Railway at Temple Meads Bristol in 1839-41. The interior of the Old Station was published in Bourne's Great Western Railway which shows the 'flattened' Gothic arches of the side arcades in a similar fashion to that of Bourne's Rugby Bridge.

3.6 Fashion for Iron

With the increase in the production of cast iron, its uses spread especially with the growth in railways. As we have seen Charles Fox was an advocate of the use of iron and a leading light in the erection of the iron-framed building for the 1851 exhibition.

One of his *fortes* was the construction of skew bridges, on which he read a paper at the Royal Institution in 1837. Apart from those at Nash Mills, Pitstone and Regent's Canal, Fox also designed that at Denbigh Hall, where the railway terminated for a time. The Stephenson drawings show a graceful design (Figs. 3.55 and 3.56). To note, the drawings cannot be entirely rationalised with Bourne's wash drawing (Fig. 3.54); nevertheless, the stone piers appear as accurate.

Of course, there were others, such as that shown in Schnebbelie's watercolour *Viaduct from Wembley Common to Harrow* (Figs. 3.57), which appear to have been of simple beam construction (Fig. 3.58) in comparison with those discussed in earlier at Wriothersley Street (Fig. 1.29), Park Street (Fig. 2.45 and Hampstead Road (Fig. 2.77).

3.6.1 Viaducts

We have already mentioned Lauder's views on the use of iron as used at Nash Mills and Pitstone.²³¹ This leads to a discussion on the aesthetics of the arch as viewed in viaducts. The viaduct is considered as being generally a high multi-arched structure

²³¹ Lauder, 1842, p. 377.

often crossing a valley and more than just a series of arches. As such it might be considered by some as a major imposition on the landscape. Based on Lauder's preference for the substantial nature of the 'Roman' arch it is therefore not surprising that Bourne produced six wash drawings of the more striking features five of which were translated into lithographs.

Although primarily built as an engineering solution to cross valleys, for the artist it was possibly seen as an imitation of Roman aqueducts (Fig. 3.59). In aesthetic terms these were viewed as an enhancement to the Roman landscape and taken up by Bourne to produce one of his more delightful lithographs based on a quickly produced wash drawing (Figs. 3.60 and 3.61). It is thus that Bury's view of the Sankey Viaduct was one of the six coloured views showing its acceptance as a topographical feature (Fig. 3.42).

In the following I have selected examples which display a number of approaches and sources. In Fig. 3.20 we saw Schnebbelie's Picturesque treatment in a rural setting enhanced by cattle and a group enjoying the scene as well as a fisherman. This romanticised view is not disturbed by a train crossing the viaduct.

Stephenson's engineering drawing of 'Bridge over the Turnpike Road at Watford' (Fig. 3.63) is a very distinctive structure which broadly appears as comprised of three arches divided by a substantial masonry block from a further two. Although chosen by both Bury (Fig. 3.64) and Schnebbelie (Fig. 3.65) Bourne went elsewhere at Watford. Interestingly both chose an oblique view. However, both also miss the uniqueness of this structure as revealed in the Stephenson plan which shows a complicated arrangement of large twin arches for the turnpike road and a slanting pedestrian underpass. The other two are blind but act as relieving arches for taking the weight of the railway.

Of course, the height of viaducts was often governed by the need to cover flood plains as with that at Brandon over the Avon (Figs. 3.66 and the lithograph 3.67). This nine-arched viaduct was deliberately featured by Bourne amidst the river with rushes growing in the foreground. From an engineering point of view it included an invert built between the three central arches where the river ran-possibly to withstand water pressure (Fig. 3.68).

The Stowe viaduct is an example of a modified view made on the eve of publication of the complete volume. First drawn by Bourne in July 1837 (Fig. 3.69) when being built with elaborate centring, it was modified in May 1839 for a lithograph shared with Rugby Bridge (Fig. 3.49.) at which time the title was changed.

Figs. 3.73 shows the Wolverton Viaduct under construction. The centring has been removed but scaffolding remains in place and possibly what appears to be a travelling gantry. In the wash drawing it is clear the viaduct is not yet connected to the embankment then being constructed as shown in Fig. 3.74 and Stephenson drawing at Fig. 3.75.

3.6.2 Embankments and Cuttings

Embankments and cuttings as an aesthetic provides a mixture of responses which are in part make one wonder at the immensity of the undertaking. This is enhanced by the human effort and danger involved and the reading of the process. There is then an element of the Sublime.

As we have seen the Wolverton Viaduct was built to cross the River Ouse and required an approach by a high embankment to reach it (Figs. 3.76) it therefore required a fair amount of spoil which was brought by locomotive from Denbigh Hall cutting 3 miles away.²³² Skempton gives an account of the problems that arose as a result. This can be detected in Bourne's illustrations - accepted as sound evidence by Skempton. For instance, one can see an approaching train bringing spoil from Denbigh Hall.

Fig. 3.76 confirms Skempton's evidence that a large slip developed in the bank which was bridged by a temporary wooden bridge to enable end-tipping to continue. The bank was formed by end-tipping waggons as seen in Fig. 3.77 which ran on temporary railway track. The spoil can just be seen toppling down the slope, possibly caused by running the waggon up against a baulk of timber which caused its sudden arrest and rapid discharge. Eventually the required level and distance was reached to link with the viaduct.

²³² Skempton 1996, pp. 33-49, pp. 41-42.

Where there was a lack of spoil which could be brought from excavations elsewhere—that is using the ‘cut and fill’ method—embankments were built by adjacent burrowing as in Figs. 3.78. In this one can see the spoil being dug out at the sides and being hauled up in guided barrows pulled up by horses. At the top the material was deposited in waggons for distribution where needed along the embankment. This side-cutting required land in excess of the actual area used for the railway and was therefore expensive.²³³ In the lithograph (Fig. 3.79) of the proceedings much of the practice of ‘robbing’ soil is lost in the desire to harmonise the image but the wash drawing provides acceptable evidence.

Following the embankment at Boxmoor, Bourne moved on to the two-mile cutting at Tring where he drew the reverse procedure to that at Boxmoor. In this one can observe the beginnings of making a cutting. One can sense Bourne’s delight in the subject matter, but out of three wash drawings made the result was only one lithograph (Fig. 3.83). This is a combination of Figs. 3.81 and 3.82. Fig. 3.80 shows the general preparatory work in making a ‘heading’ or the preliminary depth that already has been achieved with the centring in place for a three-arched bridge and planks placed for the barrow runs as seen in Fig. 2. 44 by Scharf.

The outline of the process can be explained from Fig. 3.81 in which a loaded barrow was guided by a labourer up a plank assisted by a horse from above. The rope that linked them ran over a pulley fixed to a bench-like arrangement: alongside this lay a contractor’s wagon. In Fig. 3.82 the formation is more advanced with a number of ‘runs’ in place and the sides clearly on an angle of repose. However, the activity shown in Fig. 3.82 is missing but drawn into the complete lithograph (Fig. 3.83) in which the process is being conducted on both sides.

3.6.3 *Architecture*

An overriding factor was the choice for the architecture used for the engineering. As we have seen this was produced in Stephenson’s Drawing Office and made available on site. With stations this is less clear as Bourne only included those at the

²³³ Skempton 1996, p. 34.

termini. Possibly they were seen as the preserve of architects, such as Philip Hardwick, rather than engineers.

From an engineering viewpoint the railway was perceived as one continuous example of architectural engineering defined by railway track as it ran like a Panathenaic procession from Philip Hardwick's Doric propylaea at Euston (Fig. 2.101) to his Ionic temple at Birmingham forming a 'Great National Line of Railway'.²³⁴ Thus the masculinity of Doric was complemented by the feminine Ionic (Figs. 3.84 and 3.85) as seen in the wash drawing and lithograph of the Birmingham terminus entrance and Fig. 3.86 the elevation of the train-shed side as also seen in Fig. 3.87. Fortunately, there is evidence for an intermediate station. That at Watford was drawn by Schnebbelie from two directions. Fig. 3.89 looks east with the station on the right and Fig. 3.90 looks west with the station on the left.

3.7 Logistics of Publication

In this section I am concerned with how the above discussion of genre was put into practice. In doing this I begin with an analysis of the logistics of publication in which I examine the order in which Bourne conducted his three campaigns in assembling his wash drawings. Starting in August 1836 these were completed by May 1839 (see Appendix 1 Table 1). By June 1838 the main campaign was completed (Appendix Table 3 Part 1) here began the selection of wash drawings for translation into tinted lithographs and serialised in four issues. These do not follow sequentially the route from Euston to Birmingham but appear to have been selected at random to provide a mixture of views (see Appendix Table 2 Part 2 for conjectural publication programme). Despite a considerable number of wash drawings those that were discarded (Appendix Table 3 Part 3) left a shortfall which called for a further limited campaign (Appendix Table 3 Part 2).

Towards the time of the final issue, John Britton composed his promised 'Description' which became the introduction to a combined bound volume. Whilst this shows that most lithographs were complete there was still a need for a further three beyond the initial list (Table 2 (Part 1) and Bourne was dispatched in April and May

²³⁴ *Gentleman's Magazine Literary Advertiser* 164 June 1838.

towards Birmingham to provide them. This included those still needed to make up those initially planned (illustrated in Table 3 Part 2).²³⁵ This surely suggests Britton's deeper involvement in the order of publication. Furthermore, all the plates themselves are without captions, which indicates that the order for the four parts was a matter of later choice.

3.8 Bourne's Campaigns

It is through the campaigns that we can follow the balance between Bourne's contribution and Britton's objectives. In Chapter 2 we examined Bourne's preparatory wash drawings made of the near mile-long Euston Extension. I argued they were produced rapidly with ten wash drawings created between 11th August and October 5th 1836. These show unexpected detail for subjects executed with such speed. Despite this, the subject matter was generally found unacceptable for publication (see Table 3 Part 3). Of the first eight produced, the only two accepted became Plates V and VI) (Figs. 2.86 and 2.52).

At the end of his initial campaign around Camden, Bourne briefly crossed the canal in mid-October where he made a wash drawing of the Birmingham Railway Depot. This became an overture to the events that followed.

For a few months, as far as the railway was concerned, Bourne lay low: possibly he was smarting at the poor reception received for his Euston Extension wash drawings. However, in April 1837 he was spurred into action to embark on his year-long campaign during which he gathered together most of his portfolio. It is this event which ties in with the beginning of Britton's influence in achieving his motives.

The logistics of this were governed by engineering progress, which itself was dependent both on weather and the ability of contractors to carry out their obligations. In fact, a number of them failed financially and the railway company was

²³⁵ *Rugby Railway Bridge April 1839, Near Coventry. River Some, May 1839, and possibly Blythe Viaduct, Hampton in Arden.*

forced to take over eight of the thirty contracts (see Fig. 1.8).²³⁶ In the main, then, his movements were haphazard (see Table 1). They appear dependant on information gained of progress along the line. Bourne sometimes had to return to a site to follow up progress. Such was the case with Primrose Hill Tunnel (April and October 1837) and Euston (May and October, January and April 1838). However, major attractions, such as Kilsby Tunnel, kept him occupied on site from 8th to 26th July.

It was to his advantage that the original contracts had all been let between May 1835 and November 1835 (see Fig. 1.8), with construction work well underway when Bourne started his peregrinations. One can assume that Bourne had access to the sites through contact with the on-site engineers. In fact, the fifteen principal works all feature in Bourne's portfolio for which individual engineers would have been responsible.²³⁷ This may have had some impact on the detail of his drawings, which often show some inherited factors attributable to the Stephenson drawings that would have been available on-site, but also through contact with individual draughtsmen - such as Charles Cheffins, who was to play a part in Bourne's later career.²³⁸ One can vaguely see some knowledge gleaned by Bourne of engineering practice in the four vignettes used on the title page.²³⁹

Due to difficulties in completing the Kilsby Tunnel, the railway temporarily terminated at Denbigh Hall. Road coaches were used to transport passengers between there and Rugby from April 1838 to June 1838. However, Bourne was at Denbigh Hall in June 1837 from where he made excursions to Wolverton and, in July to Blisworth Cutting and Kilsby Tunnel, where he was enthralled by the engineering and was allowed to make two drawings of the interior.

²³⁶ Michael M. Chrimes, 'Robert Stephenson and planning the construction of the London and Birmingham Railway', *Proceedings of the First International Congress on Construction History, Madrid, 20th-24th January 2003*, ed. S. Huerta, Madrid: I. Juan de Herrera, SEdHC, ETSAM, A. E. Benvenuto, COAM, F. Dragados, (2003), pp. 593-609.

²³⁷ Chrimes, 2003, (Table 3) p. 596.

²³⁸ Of the three copies made, one was for the use of the committee, one for the engineer-in-chief, and one for the assistant-engineer superintending the district in which the work was situated.

²³⁹ Four vignettes cleaning, building, levelling and opening (1990-7251) (68 mm. diameter).

On 19 June 1837 Bourne observed the building of the skew bridge at Boxmoor, a year before the opening of the line there. Its oblique construction, designed by George Buck, was something of a celebrity and warranted a book on the subject, as already mentioned.²⁴⁰ In the same month Bourne was absorbed in making a number of sketches of the Tring Cutting which remained unopened until January 1838.

Towards the end of July there was a falling off in wash drawings with none accomplished in August but by September Bourne was moving back towards Euston picking up a few sites along the way including a return visit to Primrose Hill Tunnel in October where the portal was now complete. At Euston, the portico was now underway which Bourne recorded, but by January it had progressed little more and Bourne had to wait until completion in April to produce what became the first drawing in the combined volume.

After the year-long campaign Bourne had his main portfolio to hand consisting of nearly forty seven wash drawings compiled over that period which needed weeding out for transfer onto lithographic stone. Possibly the tailing off in production from July was time spent in sorting out suitable material, filling in gaps in his portfolio or making a start on transferring wash drawings onto stone. Of the total made in the year-long campaign twenty-seven were selected but actual publication did not start until September 1838.

Although a mixed bag, the wash drawings are in themselves a unique record made before completion of many of the structures and are therefore valuable archaeological evidence of a railway under construction on the eve of the railway mania. As well as being works of art in themselves, the dated descriptions add enormously to their value.

In Bourne's campaigns, which jump backwards and forwards, one enters a kind of synoptic experience arising from these descriptions as one is invited to enjoy and remember the topographical journey as each drawing punctuates the terrain made up of bridges, cuttings and tunnels.

²⁴⁰ Buck, 1839.

3.9 Decisions on Which Images to Publish

By June 1838 Bourne had accumulated a total of fifty-eight wash drawings (see Appendix 1 Table 3 Part 1 with Part 3 (discards)). An advertisement appearing in the *Gentleman's Magazine* stated the intention to publish thirty-two of them.²⁴¹ Clearly from this advert, tinted lithographs would be the medium: in the manner of James Duffield Harding's *Sketches at Home and Abroad* published in 1836. Harding and Hullmandel (Figs. 1.17, 1.18 and 1.19) dabbled with railway illustration much earlier. Indeed, Hullmandel was to be closely associated with Bourne in printing of many of the *Drawings*. Apart from Harding, work by of David Roberts and Clarkson Frederick Stanfield also were included in the advertisement. All were topographical lithographers and well-known for their travels. Roberts, in particular, developed Orientalism, as I will argue in Chapter 4. In some respects, although not directly so, they were part of a coterie using the same lithographic printers: in this case, Louis Haghe and Charles Hullmandel himself, who can be traced back to Senefelder.

The proposed subject headings were advertised in *The Architectural Magazine*.²⁴² *The Drawings* - a title which itself echoes that of Harding's *Sketches* - would be published in four parts, each of eight drawings, starting on 1 July at a cost of £1. 1s (£1.05) each part: the last of which would include a brief topographical and descriptive account by Britton.

Appendix Table 2 (Part 1) gives both the list from *The Architectural Magazine* with the completed list of tinted lithographs as ultimately published. Although numbered up to thirty-seven, this gave a total imprint of thirty-five including the frontispiece (Roman numbers ii to xxxii less i), and iii being a woodcut). Furthermore, the placement of ten lithographs on five pages brought the pagination near to the promised thirty-two pages as advertised, including maps. Although Elton (in Klingender) does not specifically say so, it is possibly that the doubling up of images may have been an economy in the print run, as he was using a heavy paper by which the 'lights' were obtained.²⁴³ The publication programme followed that

²⁴¹ *Gentleman's Magazine Literary Advertiser*, p. 164.

²⁴² *Architectural Magazine* 1838-1839, p. 609.

²⁴³ Klingender, 1968, p. 136.

specified in *The Architectural Magazine*, but then it began to drift in a different direction. For instance, *The Gentleman's Magazine* for September 1838 indicates eight (in fact, seven) were on course and a further seven were planned by December (Appendix Table 2 Part 2).

It is clear that despite a large portfolio of fifty-seven wash drawings - including those of the Euston Extension - cherry picking reduced these down to twenty-eight for publication (Appendix Table 3 Part 1).²⁴⁴ Part 2 contains a further six bespoke drawings and lithographs. The twenty-nine discards are shown in Appendix Table 3 Part 3. The combination of the three parts of Table 3 (part 1-28), (part 2-6) and (part 3-29) therefore accrue to a total of sixty-three wash drawings.

From such a comprehensive portfolio of sixty-three made at Bourne's choice, why were so many rejected? A glance through Appendix Table 3 Part 3 gives some indication: these include the eight from the Euston Extension previously mentioned, there are also duplicates for Tring Cutting, and Kilsby Tunnel. Others, such as Primrose Hill Tunnel, were replaced by a more sanitised version, and the two for the Euston Portico under construction were not deemed fit for the grand intention of a propylaea until it was finished.

The reasons for the accumulation of so many can be easily laid at Bourne's door. Not surprisingly he wanted plenty of choice and being a rapid interpreter this did not present a difficulty. However, with Britton as the *gris eminence* in many ways one does suspect that it was he who had a hand in the matter. Although Britton's co-authorship is prominently featured in the publicity, Britton's involvement at the publicity stage in June 1838 appears rather casual. As the writer of the *Description* he only got round to doing this in April 1839. By this time, most of the lithographs had been published.²⁴⁵ However, following the culling of so many in the post-June 1838 period, a shortfall of six occurred. Three additions were commissioned in September 1838 to conform to *The Architectural Magazine* list. Two were newly commissioned

²⁴⁴ It is not always clear on the intended number. 'The present work will comprise a series of thirty-three, or more, finished sketches' *Architectural Magazine* p, 609.

²⁴⁵ Britton to Creed (British Railways Board HL R/281/3).

in April and May 1839.²⁴⁶ One was undated. With the latter two coming so close to Britton's intention to write the *Description* in April 1839 suggests that this was done on his instructions. It suggests he was now the driving force behind publication of the full volume of lithographs. There is also evidence that he acted in marketing *Drawings* as stated in the copy bought for the Royal Academy in 1840.²⁴⁷

Although, as I shall soon show, Bourne's choice of medium had been initially inspired by Harding's (1836) *Home and Abroad*, the contents for the full volume appear to have been chosen by Britton, who would have required a structured order for the Plates to match his text. For this, the four issues needed to be rearranged back into something near that advertised in *The Architectural Magazine* in the previous year (See Appendix Table 2 part 1 in italics). Assuming it was under Britton's directions, there was an increase in the number of lithographs from thirty-two to thirty-five. To keep the number of pages to around thirty-two there was doubling up in three more cases. This had already been adopted in the second issue in December 1838 with the interiors of Kilsby Tunnel.

Although the first issue of eight was promised for July 1838 it was not until September that the full complement was available (Appendix Table 2 Parts 2 and 3) at which time a cover was printed for eight drawings (Fig. 1.28). The following Table gives a sample of the haphazard way in which the publication of the series of four was arranged which did not follow either the final published order in the combined volume or that initially proposed around June 1838.

However, as we shall see, it was only when the complete volume was published that a plate order based more closely on that listed in *The Architectural Magazine* was adopted (see Table 3.1).²⁴⁸ It is significant that the lithographs were unnumbered.

²⁴⁶ *Rugby Railway Bridge April 1839* (1990-7245) and *Near Coventry. River Sowe, May 1839*. (1990-7249).

²⁴⁷ 'RA Council Minutes,' IX, 92.

²⁴⁸ II = No. ii, IV = No. iii, V = No. iv, VI = No. vi, VII = No. vii, VIII = No. viii, IX, X, XI = No. ix, XII = No. x, XIII = No. xi, XIV = No. xii, XV = No. xiii, XVI November + December = No. xv, XVII = No. xiv, XVIII = No. xvi, XIX = No. xvii, XX, XXI = No. xviii, XXII, XXIII = No. xx, XXIV = No. xxi, XXV = No. xxii, XXVI = No. xxiii, XXVII = No. xxiv, XXVIII = No. xxvii, XXIX = No. xxviii, XXX = No. xxv. XXXI = No. xxvi,

Apart from the desire to keep within the thirty-two pages, there was also the matter of lithographic printers - in this case either Charles Hullmandel (who printed twelve) or Day and Haghe (who printed twenty). Of course, the doubling up of lithographs onto single pages eased the load (see Table 3.2). However, for the final issue this procedure was used for four lithographs on two plates as described below. In this one perceives a slight panic to translate the April and May wash drawings into printed lithographs for July 1839.²⁴⁹ There was also the matter of the making of the handsome frontispiece with its four roundels to include the covered train shed at Euston into lithographs by September when the whole volume was published.²⁵⁰

XXXII = No. xxxix, XXXIII, XXXIV = No. xxx, XXXV = No. xxxi, XXXVI, XXXVII = Nos. xxxii and xxxiii.

²⁴⁹ Klingender (Elton 1968), p. 136.

²⁵⁰ See Fig. 2.99 *IV. Arrival and Departure Shed, Euston Station, London, 1839*) including the four roundels in Appendix 1 Table 3 (Part 1).

Table 3.1 Comparison between planned and final order in September 1839

Architectural Magazine	Bourne/Britton 1839	Issue and date
viii	X	First (July 1838)
xx	XXIII	First (July 1838)
xxx	XXXIV	First (July 1838)
ii	II	First (September 1838)
xi	XIV	First (September 1838)
iv	V	First (September 1838)
vii	VII	First (September 1838)
xiv	XVII	First September)
x	XII	Second (December 1838)
xxvii	XXVIII	Second (December 1838)
xxv and xxvii	XXX and XXXI	Second (December 1838)
vi	VI	Second (December 1838)
xv	XVI	Second (December 1838)
xvi	XVIII	Second (1838)
NOT CLEAR	NOT CLEAR	Third Issue (1839)
xxii and xxiii	XXV and XXVII	Fourth (1839)
xxxii	XXXIII and XXXV	Fourth (1839)
Not listed in June 1838	XX	Fourth (1839)
Not listed in June 1838	XXII	Fourth (1839)
Not listed in June 1838	XXXVI	Fourth (1839)
Not listed in June 1838	XXXVII	Fourth (1839)

Table 3.2 Comparative sizes of wash drawings and lithographs when published as doubles

Title	Wash drawing size	Lithograph size
Frontispiece	140 x 200mm	109 x 204mm
Primrose Hill Tunnel	234 x 335mm	169 x 259mm
Locomotive Engine House	239 x 326mm)	169 x 259mm
Great Ventilating Shaft, Kilsby Tunnel	236 x 336mm	236 x 336mm
Working shaft, Kilsby Tunnel	199 x 205mm	211 x 192mm
Blisworth Cutting	244 x 340mm	244 x 366mm
Weedon viaduct	224 x 332mm	173 x 259mm
Rugby Railway Bridge	230 x 310mm	178 x 274mm
Sherbourne Viaduct	219 x 324mm	192 x 274mm
Pitstone, Bridge over Grand Jct. Canal	181 x 264mm	179 x 266mm
Linslade Rocks	227 x 337mm	180 x 267mm

There were also delays along the way. For example, producing a satisfactory lithograph of the Oblique Bridge at Boxmoor proved difficult - a November lithograph had been produced from a wash drawing and printed by Day & Haghe (Figs. 3.24) The subject matter was of some interest in itself, as already mentioned. However, to make the lithograph of more general interest, it needed some embellishment. Cattle were added for a December printing by Hullmandel (Fig. 3.25) (Appendix Table 3 Part 1). The alternative December printing was an obvious improvement, but these were alternated in the final bound editions.²⁵¹

We can now begin to see how confusion can arise between the original publication order. Intended as advertised in June 1838 as four issues of eight lithographs with a total of thirty-two it was modified into thirty-five lithographs. The final make-up was then one of thirty-one pages with thirty-five lithographs including the frontispiece. This broke down into four issues incorporating nineteen full-size with ten half-size pages. As we shall see the final issue was of six pages which incorporated eight lithographs leaving twenty-three pages to incorporate the previously published twenty-six lithographs (see Appendix Table 2 Part 2 for conjectural publication programme; Table 3.2 for sizing).

This raises the matter of the form in which the individual plates were offered for sale. There is some evidence to suggest that as published these were offered unbound in wrappers-September and December 1838 with two issues in July 1839.²⁵² Whether the variation raised problems of cost per issue has already been mentioned: but in spite of the reduction in the number of pages from eight to six in the final issue, as well as some variation to accommodate twenty-six lithographs on the twenty-three pages, the final bound volume remained as was intended for four issues of eight pages at £4-14-6d (4½ guineas).

²⁵¹ Royal Academy Collection 06/3132, National Art Library compared with John van Laun Collection copy.

²⁵² 'A Series of Lithographic Drawings on the London and Birmingham Railway, by John C. Bourne; with Topographical and descriptive Accounts of the Origin, Progress, and general Execution of that great national Work, by John Britton, F.S.A., Author of the 'Architectural and Cathedral Antiquities of England,' 'Dictionary of Architecture,' &c. Inscribed, by permission, to the Engineer and Director of the Company. Part I. Folio. London, 1838.

In Chapter 1 I argued tinted lithographs were generally the same size as the wash drawings on which they are based. However, this raises the question of two lithographs on the same page: was there an intention to have smaller-sized lithographs from the outset? In most cases it seems from the above table that the wash drawings -- that is those drawn *en plein air* -- would in most cases need to be reduced to fit two to a page but not necessarily so. Examples of twinning occur in the final issue of eight which can be sourced from a sale notice.

*Lot 72: John Cooke Bourne (British, 1814-1896) Drawings of the London and Birmingham Railways The folio consisting of eight lithographs on six sheets, 1839, on wove, printed C.Hullmandel, London, published by J.C.Bourne & Ackermann & co, London.*²⁵³

Eight lithographs on six sheets can be accounted for on the basis of two sheets being made up of two to each. These are likely to be those drawn and published after June 1838 (Table 3, Part 2). The only pairs that fit are *Plate XXXIII. Railway Bridge Rugby with XXXV. Sherbourne Viaduct, near Coventry and XXV. Blisworth Cutting, with a viaduct in the background with XXVII. Weedon viaduct.* As for the remaining four sheets one can suggest with some certainty for three: XXXVII. Entrance to Birmingham Station, XXXVI. Viaduct over the River Blyth and XXVI. Blisworth Cutting.

In conclusion, the question of provenance and a publication programme has explanatory significance. Firstly, it further establishes Britton's part in the publication of the combined volume as a prestigious topographical work. As well as from his covert statement in *The Architectural Magazine*, this is confirmed by the late reorganization of the four issues into numbered plates to comply with Britton's accompanying *Description*.

Although it is clear Britton's intention was to create a topographical volume in the tradition of his other publications, he did not entirely have his own way. In Chapter 1 I argued there was more than a coincidental connection between Bourne and Harding. It seems Harding's *Sketches* remained in Bourne's mind since their publication in

²⁵³ Bonhams Sale on 21 September 2011.

1836 at which time Bourne was making a start on his Euston Extension drawings. It is tempting to suggest that far from being just 'subjects of professional study' Bourne was already drawn to the idea of tinted lithographs.

Martin Twyman argues Harding's 'original drawings were made over a period from September 1824 to October 1835, but many date from 1834 when J. D. Harding made an extensive continental tour. It is not known when the drawings were put on stone, but presumably sometime after October 1835. They were printed by Hullmandel and published by Charles Tilt in an edition of 1000 copies, after which the drawings were then effaced from the stones.' Of interest here is that the lithographic stone could produce such a large number.

But there were similarities between Bourne's *Drawings* and Harding's *Sketches*. For instance, the format size for both was imperial folio size (15' x 22'). The *Sketches* contained in total to fifty-one original plates of single tint lithographs (including the title page) (a few more than Bourne's *Drawings*). All were drawn on the stone by the author and Bourne followed the same practice a few years later having already started his wash drawings soon after Harding appearing in print. The attraction to Bourne is clear: Harding's use of tint-stones to create further tonal values was ideal for a railway subject matter. As we saw in Chapter 1, using an extra stone in which the 'lights' in imitation of Chinese white were achieved by scraping out hollows which under pressure in printing left a slightly raised white patch.²⁵⁴ This is not just coincidence-the use of the word 'Drawings' echoes Harding's 'Sketches'. Another Harding factor is that of his Hetton lithograph (Fig. 1.19) which may have put railways in Bourne's mind. Such facts place Harding well in line as being one of the major inspirations for Bourne's railway lithographs.

I have made the presumption that there were large numbers of individual lithographs circulating originated from broken volumes. It is more likely possible that many were derived from the four issues of loose lithographs many of which were individual coloured for display. It thus questions my own dismay at the colouring of Bourne's tinted lithographs, which I had thought was a modern addition, was possible one carried out contemporaneously.

²⁵⁴ Twyman 1965, p.48 and Plate 6.

3.10 Britton's Influence on Bourne's Aesthetics

As I've argued throughout, one key influence on Bourne's *Drawings* was Britton's political agenda to assimilate railways into the Picturesque landscape. This encouraged Bourne towards the incipient railway genre in much the same way as Britton used other accomplished artists to promote other topographical accounts.²⁵⁵ In this reading, Bourne becomes something of an accomplice.

I have argued Britton played an important role in compiling the publication list. The selection of materials for publication certainly has a bearing on the general aesthetic impression. One might assume that the advertised list of June 1838 was formed from the wash drawings already accumulated. I have argued the rejection of most of those compiled of the Euston Extension should be ascribed to Britton's budding interest in sanitizing the railway. Furthermore, although publication of lithographs of Blisworth Cutting and Birmingham Station were included in the June 1838 list, the wash drawings were not drawn until September 1838. This slightly infers that the list was drawn up by other than Bourne; if so, this was almost certainly Britton.

Perhaps the most telling example of Britton's influence is the six bespoke tinted lithographs commissioned between September 1838 and May 1839 to make up the shortfall to the original publishing plan. As two of the six were those of Blisworth, the other four are an example of direct targeting to fit a particular purpose.²⁵⁶

However, Britton's influence only accounts for some of Bourne's aesthetic impact. Supplying the brief is hardly the same as the production of images which focus more on the composition of individual images. How much influence did Britton have on aesthetics within those?

The choice of medium was already decided by Bourne, having been proved by Harding in 1836. It also suited Bourne's rapid style of recording *en plein air* through which he was able to translate the drawings directly onto stone.

²⁵⁵ *The Architectural Antiquities of Great Britain* (1807-26).

²⁵⁶ See: Appendix 1. Table 3 (Part 2) wash drawings produced after June 1838 with their tinted lithographs all published in 1839.

Bourne was also subject to the influence of other artists with their varying aims, aesthetic backgrounds, and use of media governing their approaches. As I showed earlier in this chapter, their aims ranged from factual recording to the fanciful, with varying moods to grasp the brooding nature of tunnels to open spaces. Some, such as those by Bury, whilst not being particularly accurate, were intended to show the railway in spirit as memorabilia of events, in the style of the Liverpool and Manchester Railway. Another matter was how to treat collective subjects: such was Euston Station and the Camden Depot. For this, artists selected different aspects, views, or media to suit their own peculiar purposes.

In Turner's *Liber Studiorum* and Britton's *Free Trade* motives one cannot escape from the idea of a British nationalism. The fact that landscape art was viewed by the Royal Academy as a native tradition 'considered by many to be one of the most distinctive British contributions to world art'. Combined with the opening of the Liverpool and Manchester Railway - a point in history when 'nothing that came after was ever quite the same as anything gone before' - this might be seen as a combined nationalism around art and the railway. From Britton's perspective, I suspect the same sentiment lies covertly in Bourne's *Drawings*.

Objection around 'foreignness' was apparent at the turn of the century, when Britain was at war with France. Blockade made continental travel difficult, and art became introspective in the search for new genre. One can speculate that it was out of this grew that the Picturesque thrived as seen in Britton's contribution through the series *The Beauties of England and Wales* which significantly first appeared in 1801 continuing through the war years until peace in 1815.

Britton was a Fellow of the Society of Antiquaries, and he appears, in his archaeological activities, to have followed the methods of William Stukeley (1687-1765) the first Secretary of the Antiquaries. The Antiquaries were essentially wrapped up in the archaeology of Britain and Britton recorded ancient Britain in the style of Stukeley. Britton's recording shows he was a competent artist as seen in Fig. 3.91, which was used for the title page of *Cornwall* (Fig. 3.92). It is from such a background that one can observe Britton nationalistically minded through *Free Trade* and his adoption of Bourne as the tool for using the railway to the same purpose.

3.11 Chapter Conclusion

In this chapter, I examined the layout and aesthetic considerations of Bourne's *Drawings*, with a particular focus on the production and selection of the main images for this volume. I argue Bourne played a key role developing a new railway genre of landscape imagery. This evolved from eighteenth-century aesthetic theories such as the Picturesque and the industrial Sublime. It found ways to assimilate the radical transformations to topography created by the new railway. Bourne's aesthetic choices were different from those made by his contemporaries when depicting the progress of railways. These differences have important implications for the types of information we might extract from the visual record left behind.

Bourne's aesthetic decisions were filtered further during the production and selection processes associated with the design to saleable materials. First, in the choice of single images for his initial portfolios. Second, for the composition of the *Drawings*. I argue the influence of Britton was present throughout both sets of decision-making. Whilst Britton was the innovator and wrote the commentary it is to Bourne that the credit went for his tinted lithographs. The publication logistics for this can be found in the Appendices which also contain a full record of the wash drawings and tinted lithographs.

In the next chapter, I investigate the reception of Bourne's *Drawings*. Rather than focusing on the work's immediate impact, I take the long view and consider both short and long term themes associated with the reception of his work.

Chapter 4: Survival and Renaissance of Bourne's *Drawings*

4.1 Introduction

For want of a better definition this chapter is concerned with the long view of Bourne's *Drawings*. It follows three different elements of the historical story presented thus far.

First, it follows Bourne. It follows him through what is best described as a sequel, then through a period of relatively low impact. It follows him to Kiev to investigate his experiments with photography as a tool for capturing engineering detail. I provide this narrative because I suspect there is a connection between his interest in photography and his development of earlier techniques to transfer material in stone lithography.

Second, only briefly, this chapter follows the reception of *Drawings*. The published work is a large folio. It was expensive. This was a key feature of its design in 1839. However, it later contributed to *Drawings* move into prestigious libraries rather than service as a companion to railway users and aficionados.

Third, this chapter examines the post-World War Two revival of Bourne's work, specifically in the context of the consolidation of industrial archaeology as both movement and discipline. This celebrated artists such as Bourne for their skill in capturing engineering. It also sought to transform such art into artefacts useful for extracting specific information about the industrial past. Leaders in this subject, such as Arthur Elton, championed Bourne and played a key role in reviving interest in the artist and his corpus of work.

4.2 Luxury versus Portability Determining Use

By the end of the 1830s there was a steady flow of 'guides' and 'companions' for railway passengers. These varied in quality, approach, and cost. Bourne's *Drawings* sat at the far end of quality and cost while still hoping to 'grace the drawing-room

table ... as well as [be] pleasing to practical men'. Whatever value *Drawings* may have had as a guide to the railway experience, its cost and bulk meant 'imprisonment' in a library or drawing room.

There was then the potential for a more portable, but still quality topographical guide. Such an opportunity was almost immediately seized upon by the prolific topographer Thomas Roscoe (1791-1871).²⁵⁷ Roscoe's *London and Birmingham Railway: with the home and country scenes ...* was published by Charles Tilt.²⁵⁸ Curiously, Tilt also was joint publisher with Bourne and Ackermann in the *Drawings*, and he was to go on to be the principal publisher of Bourne's (1846) *Great Western Railway*.²⁵⁹ Roscoe made good use of Peter Lecount, a railway engineer with experience of the London and Birmingham Railway. The expertise displayed by Lecount must have been considerable as he appears later to be somewhat peeved going on to publish his own account.²⁶⁰ He was also responsible for the entry on railways in the *Encyclopaedia Britannica* (1842) as well as a separate treatise on railways in 1839.²⁶¹

This popular form of engineering satisfied a growing number of laymen with amateur interests. This interest also was met by others, such as the Osbornes who devoted over thirty pages to describe the evolution of the railway, including permanent way

²⁵⁷ *Wanderings in South Wales*, with Louisa Anne Twamley the naturalist, 1837. Also, *Book of the Grand Junction Railway*, 1839 (the last two were issued together as the *Illustrated History of the London and North-Western Railway*). *Legends of Venice*, 1841. *Belgium in a Picturesque Tour*, 1841. *A Summer Tour in the Isle of Wight*, 1843.

²⁵⁸ Thomas Roscoe, *The London and Birmingham railway, with the home and country scenes on each side of the line* (Charles Tilt, London 1839).

²⁵⁹ The influence of Tilt on railway publication has been neglected. At the same time as the publication of Roscoe he was also involved in that of J. W. Carmichael, *Views on the Newcastle and Carlisle Railway* / from original drawings by J. W. Carmichael; with descriptions by J. Blackmore, engineer to the Company. (Newcastle: Currie and Bowman, 1839).

²⁶⁰ Peter Lecount, *The History of the Railway Connecting London and Birmingham: Containing Its Progress from the Commencement. To which are Added, a Popular Description of the Locomotive Engine; and a Sketch of the Geological Features of the Line*, (Simpkin, Marshall, and Company, 1839).

²⁶¹ Lecount, 'Railways' / *Encyclopedia Britannica* 1839.

from the wooden railways on Tyneside (Fig. 4.1).²⁶² Such engineering interest was to bear fruit magnificently with the Great Exhibition of 1851.

A corollary to railway guides was the timetable, George Bradshaw's timetables perhaps the most enduring. These were first published in 1839 (Fig. 4.2), before railway time became standardised on the Great Western Railway. To overcome this complication of variable time the London and Birmingham Railway produced a table showing the time variation (Fig. 4.3) along the line.

However, it was topographical description that briefly had priority for guides. In fact, 'companions' was a more fitting style for travel, as they were meant to be leafed over during a journey. The linear format adopted by Britton possibly was derived from the pattern set by *Paterson's Roads*, first published in 1785 but ran through a succession of editions until the late 1820s (Fig. 4.4).²⁶³

Possibly the 'each side of the line' sequencing in Roscoe (Fig. 4.6) was drawn directly from Britton's 'A Tabular View/of the/London and Birmingham Railway' (Fig. 4.5 upper part). This combined table showed 'the principal works on the line, with reference to drawings illustrative of many of them; the names of all the stations (principal and intermediate) with their distances from each terminal, and towns, villages, scenes, and objects adjacent to, or connected with, the railway'. Such language was used by many other 'companions'.²⁶⁴

Apart from those already mentioned, there were a host of other publications which followed soon after that of the London and Birmingham Railway in 1839. Tilt's direct contact with Bourne's publishing process gave him access to the material which could be transposed into Roscoe rapidly, possibly as early as 1839. Using steel

²⁶² Edward Cornelius and William Osborne, , *Osborne's London and Birmingham Railway guide*. Illustrated (Birmingham and London 1840) under 'History of the Rise and Progress of Railways'.

²⁶³ Daniel Paterson, *Paterson's British Itinerary Being A new and accurate Delineation And Description of the Direct and Principal Cross Roads Of Great Britain* (Carington Bowles, London 1785).

²⁶⁴ Arthur Freeling, *The London and Birmingham Railway companion: containing a complete description of every thing worthy of attention on the line...: also fare and time tables: with a map* (London, by Whittaker and Co.,[1838]. Arthur Freeling, *The Grand junction railway companion to Liverpool, Manchester, and Birmingham* (Liverpool, H. Lacey,1837).

engravings rather than stone lithography, many followed Bourne's aesthetic approach. Some show downright plagiarism, such as in Fig. 4.7. (see Fig. 4.8). Although it appears that Roscoe used Bourne's tinted lithographs as his source he may also have had access to Bourne's unpublished wash drawings.²⁶⁵ Some of Roscoe's imagery also introduces a more Picturesque quality, perhaps to offer more tourist appeal (compare Figs. 4.10 with Fig. 4. 11).²⁶⁶ Others direct copies from Bourne wash drawings which were unpublished (compare Fig. 4.9 with Fig. 3.54). Another direct copy of a Bourne lithograph was Fig. 4.12 based on Fig. 3.85.

There were other topographers, such as the prolific George Measom, who used Bourne's illustrations as a basis for their own guides. One was for the London and North Western Railway, published by W. H. Smith who had opened there first outlet and placed it at Euston in 1848 soon after the amalgamation (Fig. 4.13 after Fig. 3.74). There was then a seemingly universal plagiarism. Some of these later uses were acknowledged, such as by noting 'portions extracted (by permission of the proprietors) from Roscoe's larger work on this railway'.²⁶⁷

Through the century such 'stealing' of illustrations continued. The influential Frederick Smeeton Williams (1829-1886), for instance, raided Bourne for illustrations included in his prolific outpourings for *Our Iron Roads*, which ran into seven editions between 1852 to 1885. Bourne's tinted lithographs were redrawn, and therefore printed in reverse (Figs. 4.14 [Fig. 3.83], 4.15 [Fig. 3.76], 4.16 [Fig. 3.5] and 4.17 [Fig.3.51]). It was through works such as Williams's that Bourne's illustrations of the London and Birmingham Railway remained in the public eye for most of the nineteenth century.

Shortly after *Drawings*, Bourne was engaged in other projects using tinted lithography. He provided tinted lithographs for Robert Hay's (1840) *Illustrations of Cairo*. Considered one of the highlights of publishing of the era it used tinted lithography by Louis Haghe the joint printer of the *Drawings*. Charles Tilt with David

²⁶⁵ Roscoe 1839.

²⁶⁶ By George Dodgson, William Radclyffe, Edward Radclyffe, and others.

²⁶⁷ R. Groombridge, *Handbook for Travellers along the London and Birmingham Railway* (London 1839).

Bogue were the publishers and the plates were printed by Day and Haghe and Hullmandel.

The 'orientalism' that this contained was well established in France both as a justification for colonialism but also for its eroticism. Whilst Hay cannot be seen as introducing orientalism into British art it did much to establish it as a genre. For instance, it encouraged David Roberts to launch his monumental *The Holy Land, Syria, Idumea, Arabia, Egypt & Nubia*, published between 1842 and 1849.

4.3 History and Description of the Great Western Railway

Bourne's *The History and Description of the Great Western Railway* was published in March 1846, coinciding with the height of railway mania.²⁶⁸ It was printed by Charles Frederick Cheffins (1807-1860), whom Bourne would have known from his railway map published in 1835 (Fig. 4.19).²⁶⁹ Previously Britton had written a prospectus for this volume, but thereafter had nothing further to do with it.²⁷⁰ With Charles Tilt once again as publisher, the combination of these two railways seemed to make a pendant pair: London and Birmingham showing the building of a railway; Great Western showing railway operation.

Evidence for the association between Bourne and Cheffins comes from a common medium and method of production. This is confirmed by an original Great Western wash drawing in which the pin holes survive at the corners (Fig. 4.20), showing that the register was maintained between wash drawing and tinted lithograph as in the case of London and Birmingham Railway. Furthermore, the statement on the

²⁶⁸ *The History and Description of the Great Western Railway; including its Geology and the Antiquities of the District through which it passes, accompanied by a Plan and Section of the Railway, a Geological Map, and by numerous Views of its principal Viaducts, Tunnels, Stations, and of the Scenery and Antiquities in its Vicinity, from Drawings taken expressly for this work, and executed in lithography by John C. Bourne* (London: David Bogue, 1846).

²⁶⁹ *London & Birmingham railway: plan of the line and adjacent country*. London: C. F. Cheffins, 1835. Also, *London and Birmingham railway: Map of the Railway from London to Box-Moor, and the adjacent Country* London: Charles F. Cheffins, 1 August 1837; 1838 edition with Thomas W. Streeter. Also, *Cheffins's Official Map of the Railway from London to Birmingham, Manchester and Liverpool*. Wrightson & Webb. 1839.

²⁷⁰ Jones (Britton, 1850) p. 159 and Stephen Daniels, "'No Continuing City': John Constable, John Britton and Views of Urban History" (*Tate papers No. 33*, 2020).

lithograph (Fig. 4.21) notes the images were both drawn and lithographed by Bourne: 'From nature & on stone by *J.C. Bourne*'. A further wash drawing of the interior of Box Tunnel²⁷¹ confirms the same.

Turner's success with 'Rain, Steam and Speed,' exhibited in 1844 (Fig. 4.18), likely reawakened for Bourne the possibility of tinted lithographs of the Great Western as a sequel to *Drawings* for the London and Birmingham Railway.²⁷² Further, Turner's influence can be hazarded in the contents of Bourne's *Great Western*. Although Turner's treatment is loose, there is considerable accuracy in the Bourne tradition, as well as classical innuendo. The locomotive shown crossing Maidenhead Viaduct is a broad-gauge flyer of the Firefly class. The class came into service between March 1840 and December 1842 and remained in service into the 1860s and 70s, so one cannot be sure of the date for Turner's painting. However, its commemorative angle appears to relate to an early run over the viaduct bringing it into the Bourne era.

It is clear Turner knew his locomotives as seen by the copper haystack boiler on the locomotive. It is possibly the locomotive that was named 'Charon' - based on the inclusion of a boat on the north side of the viaduct might be a reference to the ferryman Charon, a typically classical inclusion by Turner.

Furthermore, common ground between the Turner and Bourne can be seen in the treatment of subject matter in which Bourne has moved towards the inclusion of locomotives for the Great Western series. Whilst there is still the support of civil engineering, Turner draws one into the drama of railway travel: such are the open railway carriages drawn along by a locomotive. As already implied the purpose of Bourne's second work was to convey an impression of the structures not seen from the train but, as the title page makes clear the invitation to do so comes from a broad-gauge flyer emerging from a tunnel portal (Fig. 4.22).

²⁷¹ (Elton 1975, Fig 88) presumably now in the Elton Collection Ironbridge.

²⁷² Growth in British railways was highly dependent on the development of the wrought-iron industry which led to the export of railway technology across the world. In this way it too became absorbed into the respectability of the Grand Manner which had evolved through imperial history painting to that of the industrial Sublime. This had been anticipated by Turner at the turn of the century as witnessed by his Welsh Sketchbook. See Gerald Wilkinson, *Turner: Early Sketchbooks 1789-1802* (London: Barrie and Jenkins, 1972, pp. 76 and 77) and David Hill, *Turner and Leeds: Image of Industry* (Leeds, 2008).

Bourne's *Great Western* with Turner's oil painting marks the high point of the Railway Mania as subjects fitting the 'Grand Manner'. Although there were no further opportunities forthcoming for him to use tinted lithography there were others that did. In 1848 Arthur Fitzwilliam Tait's (1819-1905) published *Views of the London and North Western Railway* through Bradshaw & Blackrock of Manchester. This was soon after the amalgamations including the London and Birmingham Railway. Tait had previously published 'Views of the Manchester and Leeds Railway' in 1845. 'Drawn from Nature, and on Stone' as they were they appear as a halfway house between the London and Birmingham Railway and the Great Western and very much in the Bourne style (Fig. 4.23).

There is a watercolour of the Ankar Viaduct on the Birmingham and Derby Railway produced around 1848 which is attributed to Bourne but it seems likely that it is by Tait too who may have planned to continue the series (Fig. 4.24).

4.4 Towards a History of Engineering

There is almost total omission of locomotives in Bourne's first publication. However, the Great Western lithographs frequently includes them showing them in action, at rest or being manufactured. The reason is that much had happened in the intervening years with locomotives becoming the railway focus.

This is partly reflected in the near completion of the trunk lines and a decline in featuring civil engineering as the main topic. The London and Birmingham Railway was absorbed into the London & North Western Railway in 1846 by which time the Midland Railway was in operation and the Great Northern by now authorised. Although more lines were to come the competing railways turned to reducing travelling time by improvements in mechanical engineering. It was thus that the stability of civil engineering turned to the romance of locomotives. This can be observed in the Great Exhibition of 1851 when railways were represented by a 'Crampton' locomotive: with its large driving wheels it was seen as the manifestation of speed under the banner of progress.²⁷³ It was such pride in engineering

²⁷³ Photograph of a steam locomotive inscribed 'Stephenson & Co Engineers, Newcastle. South Eastern Railway London to Paris, Folkestone & Boulogne & Dover & Calais. Crampton Patentee'. Department of Civil Engineering, Environmental and Geometric Engineering. Also

achievement that evolved into engineering history in which Bourne was to play a minor part but one that took him into a new medium.

This comes through Bennet Woodcroft (1803-1879) who in 1847 was appointed Professor of Descriptive Machinery at UCL marking a rise in the status of mechanical engineering and chiming with the foundation of the Institute of Mechanical Engineers by George Stephenson. Woodcroft has been called an 'industrial archaeologist'-a style that would not appear until at least 100 years later-but it aptly sums up his attitude to machinery as having historic and intrinsic value and laid a platform for the rediscover of Bourne in the next century.²⁷⁴

This naturally evolved from his role as custodian and academic. Following his appointment to UCL he embarked on his publication 'A sketch of the origins and progress of steam navigation from authentic documents'.²⁷⁵ Soon after the publication of the Great Western Railway, Bourne was enlisted to produce six drawings for Woodcroft which the adaptable Cheffins lithographed. As these are of a technical nature it is clear Bourne could turn his hand to interpreting Bernoulli Barlow's engineering drawings (Fig. 4.25) through his own distinctive style. In Fig. 4.26 one can see Barlow's skill as a compiler of Patents on behalf of Woodcroft.²⁷⁶ This was to equip Bourne adequately for the task he followed in Kiev alongside his associate Cheffins in which Bourne adapted his rapidly produced wash drawing talents to the medium of photography.

4.4.1 Bennet Woodcroft and the Patent Office Museum

Considering Woodcroft's appointment to University of London and his passion for the history of machinery it is not surprising that patent procedure absorbed him. As a

marked by John Francis's *A history of the English railway, its social relations and revelations. 1820-1845* (London, 1851).

²⁷⁴ National Portrait Gallery (NPG. 5416).

²⁷⁵ Bennet Woodcroft, *A Sketch of the Origin and Progress of Steam Navigation from Authentic Documents* (London, 1848).

²⁷⁶ Henry Bernoulli Barlow, *A comparative account and delineation of railway engine & carriage wheels* (John Weale 1848).

result, of a reorganisation of the British Patent Office in 1852 he became Superintendent of Specifications.²⁷⁷ Following from the Great Exhibition, the proceeds were in part allocated to the South Kensington Museums to which Woodcroft was invited to make a selection of historic machinery which was put onto display as the 'Patent Office Museum' when the museum opened in 1857.

Woodcroft continued to collect notable items such as the oldest surviving railway locomotive 'Puffing Billy' and Stephenson's 'Rocket'.²⁷⁸ In these one sees a Nationalistic purpose towards proselyting Britain as the Workshop of the World. It also laid the foundation for the Science Museum as a follow on from the Great Exhibition. Ultimately this was to lead on to the post-war rediscovery of Britain's industrial past with its spin-off as industrial archaeology which I discuss later.

However the part played by Samuel Smiles (1812-1904) should not be dismissed in establishing the history of technology as a discipline. Without his evangelism Bourne might have remained as an artistic curiosity but Smiles prepared the ground for his recovery as an adjunct to the post WWII enthusiasm for the disappearing railway infrastructure. Smiles's *Lives of the Engineers*, although written with a moral turn in mind, were also essentially histories of working-class engineering heroes with whom the post-war artisan could identify. Such were George and Robert Stephenson who were the first examples to be published which coincided with the opening of the 'Patent Office Museum' in 1857 and therefore dovetailed with Woodcroft's mission.

From his writings on self-help²⁷⁹ one gathers those Victorian values which provided 'combined stories of human struggle and self-determination with those of technical achievement and entrepreneurial endeavour'.²⁸⁰ Once again one can perceive a

²⁷⁷ Patent Law Amendment Act (1852).

²⁷⁸ John Liffen, 'The Patent Office Museum and the beginnings of railway locomotive preservation', *Early Railways 2, Papers from the second international early railway conference* (M J T Lewis editor) (*Newcomen Society* 2003), pp. 202-220. Also, Bennet Woodcroft, *Patents for Inventions. Abridgement of Specifications relating to Railways. AD1770-1863*. (London: Eyre and Spottiswoode, 1868). R M. S. Hall, 'Woodcroft's Heritage: The Collections at the Science Reference Library', *The British Library Journal Vol. 6, No. 1, SPRING 1980*, pp. 65-76.

²⁷⁹ Samuel Smiles, *Self-help with illustrations of character and conduct* (John Murray, London, 1859).

²⁸⁰ Henry Petroski, 'Lives of the Engineers', *American Scientist*, Vol. 92, 2004, The Scientific Research Society. Reproduction Sigma Xi, p. 410-414

Nationalistic trend in its description as a 'pantheon of significant engineers and the canon of landmark engineering projects in British history had been formed'. From this one can grasp that the Stephensons were in Smolean terms, suitable candidates for inclusion in this British pantheon in which opportunity was available to all.²⁸¹ This 'Britishness' is also marked by the establishment of the National Portrait Gallery in 1856: it is significant that both Stephensons are included in it, and George Scharf's son, Sir George Scharf (1820-95), was the first Director.

4.4.2 Establishment and Role of The Science Museum

After Woodcroft's death in 1879 the Patent Office Museum collection was transferred to the South Kensington Museum in 1883. Thus it became an integral part of the Science Museum when separated from the South Kensington Museum. It has rightly been stated that without Woodcroft it is doubtful if some of the most important artefacts of the first industrial revolution would have ever been preserved,

Considered as a national asset the 'Rocket' remained at the Science Museum for 150 years but under pressure from the north of England, where it was considered as 'Our Elgin marbles', it was 'returned' to the north to be placed on long-term loan to a branch of the Science Museum at the National Railway Museum in York.²⁸² In this one sees a regional 'nationalism' through reverence being placed on it by association rather than engineering achievement or aesthetics which made it an icon to the birth of the steam railway. It also went hand in glove as an apotheosis in the form of a monument to the Stephensons. Such reverence for an object gives it the status of a totem representing the industrial revolution in Britain as a world leader: from this reverence academic study of individual items followed.²⁸³

²⁸¹ Samuel Smiles, *Lives of the Engineers, with an Account of their Principal Works; Comprising also a History of Inland Communication in Britain* (John Murray 1861). Samuel Smiles, *The life of George Stephenson, railway engineer* (London: J. Murray, 1857).

²⁸² Angela Connelly and Michael Hebbert, 'Liverpool's Lost Railway Heritage' (*MARC Discussion Paper. Manchester Architecture Research Centre, University of Manchester* 2011)

²⁸³ Michael Bailey and John Glithero, *The Engineering and History of 'Rocket': A Survey Report* (Science Museum 2000).

The part played by Woodcroft in establishing a history of technology is therefore highly important. From this grew an affection for such railway memorabilia and its significance which can today be seen as not just nostalgia but the machine aesthetic attached to it. In this way the museology around it grew to have equal status with other more obvious aesthetic collections. However much of the documentary sources were placed in the National Archives as discussed in Chapter 1 but the Bourne wash drawings considered separately and assigned to the National Railway Museum (an offshoot of the Science Museum) thus acknowledging them as substitutes for the 'artefact' beyond being simply archival.

Herein lies the importance of Bourne's *Drawings* and the ultimate assignment of the wash drawings to what had become a museum of objects. This argument-that a work of art can become an artefactual substitute when put on display-was observable in the Welsh Arts Council's exhibition of 1978 'Art of the Engineer' in which engineering was given a step up as being an art genre to be considered equally alongside artefacts.²⁸⁴

The Science Museum was then pivotal in focusing attention on Britain's role in the nineteenth century as an industrial world leader. In the mid-twentieth century the railway achievements of that period came under threat prompting conservation movements leading to the establishment of such industrial museums as Ironbridge and Beamish with the former becoming a World Heritage Site. In these, artefactual interest was extended to educational value in which supporting documentary material including such as illustrations were added-to this photography can be included. However in this we are concerned with Bourne's role.

4.5 Bourne's Extension into Photography

Woodcroft's appointment to University of London was preceded by the senior engineering discipline of the 'Civils'. Since its foundation in 1826 University of London had offered Civil engineering as a 'system of academical education' to

²⁸⁴ (Andrew Knight), *Art of the Engineer: Two hundred years in the development of drawings for the design of transport on land, sea, and air* (A Welsh Arts Council Touring Exhibition, 1978) published in 1981 (Ken Baynes and Francis Pugh) James Clarke (Cambridge).

‘young men intended for the scientific profession of Civil Engineer’.²⁸⁵ Charles Blacker Vignoles (1793-1875) held the post of Professor of Civil Engineering for a limited period (1841-43) having previously been a successful railway engineer with such as the Liverpool and Manchester Railways, where he was a rival to George Stephenson. The opportunities arising with the Railway Mania tempted him to return to railway construction including other engineering activities, including the building of a chain bridge over the River Dneiper at Kiev between 1846 and 1853. In this Bourne and Cheffins were jointly employed with Bourne acting as resident artist.

The distinction between the two engineering mainstays - Civil and Mechanical - were less defined at the time so that engineers frequently moved between the two. Such versatility is apparent between Bourne and Cheffins: the latter both cartographer and printer produced maps and plans of the London and Birmingham Railway for Robert Stephenson whilst working at the Eyre Arms Hotel (Fig. 1.7).²⁸⁶ He was also the printer of Bourne’s *Great Western Railway* and the lithographer of Woodcroft’s steamboats. He was therefore in a good position to produce the master map for the published ‘London and Birmingham Railway’ as well as possibly supplying Bourne with the detail for his lithographs from Stephenson’s drawing office. He was also well placed to feed Brees and Simms with plans and sections which were published as seen in Chapter 2.

One can see a *smorgasbord* of contributions which kept an undercurrent of Bourne’s lithography alive. Such then is the case with his lithographic background which led him to photography.

4.5.1 Photography

The connection between Bourne’s method of recording through wash drawings and their transfer onto lithographic stone as applied in his two railway publications suggests a possible dress rehearsal for what follows.

²⁸⁵ UCL CEGE history PDF.

²⁸⁶ ‘Memories of Charles Frederick Cheffins’ in: *Proceedings of ICE. Institution of Civil Engineers (Great Britain). Vol XXI. (1861/2). pp. 578-80.*

It seems that soon after their joint work for Woodcroft, Cheffins and Bourne were involved with Vignoles who was on the brink of building the chain bridge across the River Dnieper.²⁸⁷ In December 1846 Vignoles contacted Cheffins to prepare drawings (Fig. 4.27) and a watercolour. The commission for the latter was passed by Cheffins to his colleague Bourne in which the proposed crossing was to be shown (Figs. 4.28 and 4.29). By January 1847 Vignoles had 'received Geometrical and perspective Drawings of the Kiev Bridge magnificently finished and mounted in the manner required and enclosed in a splendid Box.'²⁸⁸

Bourne's watercolour appears to have impressed Vignoles so that when, in February 1848, the building team assembled at Kiev, it included Bourne as resident artist who was responsible for producing record drawings and photographs (calotypes) as required. According to Vignoles' journal, at the close of each season a set of these photographs was placed in an album for the Tsar.

By February 1849 it seems that Bourne was making calotypes of the work and by April using the same to record damage to the temporary bridges caused by ice floes. However, at the initial stages he appears to have used mixed media sketches (Figs. 4.30 and 4.31).

In August 1852 Roger Fenton was brought from London to make stereoscopic views and by September both Bourne and Fenton were taking photographs under the supervision of Vignoles on a regular basis as construction of the bridge progressed. Initially these were made by Fenton (Figs. 4.32 and 4.33) but by 1853 Bourne carried on alone (Figs 4.34-4.37) when Fenton returned to London. The best of Bourne's were mounted to show the Tzar the progress in the construction.

²⁸⁷ Here one might question the appeal of Russia. In 1848 Bourne provided the lithographs for Edward Pett Thomson's, *Life in Russia* which coincided with his appointment as resident artist a few months earlier.

²⁸⁸ John Vignoles. 2012: 'The construction of the Kiev Suspension Bridge 1846-1853'. -*Proceedings of the Institution of Civil Engineers-Engineering History and Heritage*, v. 165, n. 1 (February 2012). Quoted in John Vignoles from C.B.Vignoles's Journal 3 January 1847. British Library <https://doi.org/10.1680/ehah.2012.165.1.21>.

Roger Fenton is best-known for his photographs of the Crimean War, made a few years later.²⁸⁹ He had been converted to photography in 1851 following a visit to the Great Exhibition. Following this visit he went on to Paris to learn the waxed paper calotype process which was an improvement on Henry William Henry Fox Talbot's (1800-1877) method. Fenton later said:

'The impulse given by the Great Exhibition had so increased the number of photographers, and the art itself had, by the competition and' comparison which that exhibition induced, been so improved, that it was evident it was about to enter into a new phase of its history.'²⁹⁰

Whilst in Kiev it appears that Fenton's contribution was mainly that of producing stereotypes (dual photos at slightly different angles giving a 3-D effect) and due to Vignoles's own enthusiasm for photography. At the first meeting of the Photographic Society in 1853, of which he was a founder member with Fenton as secretary, Vignoles stated that:

*the great services which the new Art would be likely to render to engineers and others having to superintend important works which they could only occasionally visit, or having to make intelligible to foreign employers speaking a different language, with whom they could interchange ideas only imperfectly in conversation, the details of blocks and ropes, and complicated constructions. He instanced the pictures taken of the works now going on at Kieff for the suspension bridge he was erecting for the Emperor of Russia, over the Dnieper, on which photographic views had been taken weekly during the whole time of its construction, and especially of the method of raising the chain from the first tightening of the ropes to the final elevation of the whole to its proper position, which have been shown with the greatest accuracy and detail.*²⁹¹

²⁸⁹ John Hannavy, 'John Cooke Bourne. Charles Blacker Vignoles and the Dneiper Suspension was Bridge at Kyiv,' *History of Photography* Vol. 28, No 4. pp. 334-47 (Winter 2004).

²⁹⁰ *The Journal of the Photographic Society of London ...* volume 1 (1853-54), p. 3.

²⁹¹ *Photographic Society*. No 1. March 3, 1853, p. 5.

Fox Talbot and Vignoles were Fellows of the Royal Society, and the latter would have been well-informed of photographic developments.

Although Bourne was using calotypes as early as 1849, it was not until 1853 that he was more committed to photography (Figs. 4.32-4.37) until the completion of the bridge. It therefore seems that one can conclude that Bourne received some instruction from Roger Fenton in the production of stereoscopic photography as a more efficient means of making a periodic record of the bridge's construction as well as having appeal to the layman. In 1854/5 Bourne exhibited nineteen pictures at the Photographic Society of which nine were of the bridge.²⁹²

There is a possible link between Bourne's use of the *camera lucida* for his London and Birmingham wash drawings which might suggest that as early as the mid-1830s he was using some unrevealed method of making rapid records which could be 'fixed' in a more permanent way. Examination between a number of his wash drawings with the tinted lithographs based on them show exact comparison (see Fig. 4.38) even where there has been considerable adjustment between them. Bourne would have known of Fox Talbot's experiments which were beginning to bear fruit in 1835 a little before Bourne made his first drawings of the railway. Fox Talbot too used a *camera lucida* and later moved on to the *camera obscura*²⁹³ - thus an embryonic 'art of photogenic drawing' was borne in 1839 as the 'calotype' to chime with Bourne's publication of the *Drawings* as well as the alternative 'daguerreotype' of Louis Daguerre (1787-1851).

There is a further connection between Bourne and Fenton. To overcome the lengthy process required for producing images Fenton had purchased a former wine merchant's van as a mobile darkroom for his Crimean coverage. This lengthy process was addressed by Bourne in 1855 (Patent 674) who appears to have come up with a partial solution which he presented as a paper to the Society in 1856

²⁹² Roger Taylor, 'Photographic Exhibitions in Britain 1839-1865,' *National Gallery of Canada*, (Ottawa 2002. Also, research database <http://peib.dmu.ac.uk/index.php>.

²⁹³ https://www.metmuseum.org/toah/hd/tlbt/hd_tlbt.htm.

(Fig.4.39). Interestingly this was followed in the *Proceedings* by Roger Fenton's account of his Crimean experiences in 1854.²⁹⁴

It is often stated that Philippe Delamotte's photographic record of the entire reconstruction of the Crystal Palace at Sydenham between 1853 and 1855 was the first use of photography in this way. However it is likely that the precedent for Delamotte's record was set by events at Kiev. No doubt it was the publicity given to Delamotte's record as a means of training Royal Engineers that led to its use in such projects as the extensions to the South Kensington Museum (1856) that won the day.²⁹⁵

As I have suggested photographs of railways could then be used for aesthetic purposes as a record in its own right or to supplement some other purpose such as geology. Bourne's lithographs at Blisworth Cutting show a tendency towards this (Fig. 4.40)²⁹⁶.

One might guess that Bourne and Fenton indirectly instigated the use of photography as an aid for William Powell Frith's iconic high-Victorian painting 'The Railway Station' of 1862. 'Mr. Samuel Fry [is] [1835-1890 the Brighton photographer engaged in taking a series of negatives 25 x 18 inches and 10 x 8 inches of the interior of Great Western Station, engine, carriage, &c., for Mr Frith, as aids to the production of his great painting Life at a Railway Station. Such is the value of the photograph in aiding the artist's work, that he wonders now how he ever did without them!'. This was later engraved and marketed in a similar fashion to Ackermann's promotion of Bourne.²⁹⁷

²⁹⁴ *Journal 1855/56*, pp. 284-291. Also Baldwin, Gordon, Malcolm Daniel, and Sarah Greenough, with contributions by Richard Pare, Pam Roberts, and Roger Taylor, *All the Mighty World: The Photographs of Roger Fenton, 1852-1860* (Yale, 2004).

²⁹⁵ Eduardo Romero Oliveira, 'Photographic views of railroads: recording public works in nineteenth-century Brazil', (*História, Ciências, Saúde-Manguinhos*), Vol. 1.25 no.3 Rio de Janeiro July/Sept. 2018), p. 7.

²⁹⁶ See Fig. 3.29 for discussion on geology.

²⁹⁷ Nancy Rose Marshall, 'On William Powell Frith's *Railway Station*, April 1862.' *BRANCH: Britain, Representation and Nineteenth-Century History*. Ed. Dino Franco Felluga. Extension of *Romanticism and Victorianism on the Net*. Web. [accessed 25.05.2021].

4.5.2 *Postscript to Railway Photography*

At the end of the nineteenth century, in direct imitation of Bourne's Euston Extension, S.W.A. Newsom' employed photography for the purpose of recording the building of a section of the Great Central Railway.²⁹⁸ In this work of a Leicester photographer one sees the influence of Bourne in concentrating on structures rather than the mechanical, but it also gave him an opportunity to feature social aspects of those involved. Like Bourne, Newsom's pictures of navvies (Fig. 4.41) take up the theme of flaneur-type drawings and the treatment of engineering which are Bourne-like (Fig. 4.42).

Both appreciated a dystopia caused by railway construction. In the case of the Great Central a direct line from the north into London cut through a myriad of confusing lines. An extension to the continent was planned as part of Sir Edward William Watkin's dream. In a way this late nineteenth-century ambition at the tail end of railway construction was similar to that at the beginning-one recorded by the up-to-date tinted lithography with the latter photography.

4.6 Bourne and Advertising for the Railway

The opening of the first 'modern' passenger railway was an epochal moment that divided 'the past from the future so that nothing that came after was ever quite the same as anything gone before.'²⁹⁹ Although the railway was becoming engrained in the British psyche, the railway system was still mainly limited to trunk lines that cooperated in providing links to major towns and cities. By 1845, these were linked through branch lines so even remote areas were influenced by railway activity. Personal and business communications had improved with the introduction of the Penny Post in 1840, and the Royal Mail began to be carried by the railway around the time of the opening of the London and Birmingham Railway.

Whereas the developing railway system offered advantages, it developed a confusion of choices with regard to routes. To some extent this was solved by

²⁹⁸ L. T. C. Rolt, *The Making of a Railway-the building of the Great Central Railway* (Hugh Evelyn 1971).

²⁹⁹ Elton, 1963 (Gwyn and Cossons (2017)).

Bradshaw's timetables (Fig. 4.2), but the attempts to win over patronage prompted advertising.

Bourne's and Britton's mission in the 1830s was to win over approval for the railway as an accompaniment to Free Trade. In this Britton's concern was advertising the 'product'. The same goal continued as the era advanced through the writings of such as Frederick Williams.

*This endeavour to sketch the rise and progress of the Railway System; to describe the various processes in the erection of the noble and wonderful structures which the formation of our Iron Roads has called into existence; to explain the arrangements which are necessary for their successful management; and to point out those social influences which have arisen from their establishment.*³⁰⁰

However, as the railway system grew, it moved towards the 'brand' of individual competing railway companies. Such competition encouraged Britton to ask for the support of the railway company to permit the posting of individual lithographs at stations along the line.³⁰¹

Advertising by the London Midland and Scottish Railway followed a conservative style of referencing by harking back to Bourne's frontispiece of the Euston Portico.

The Euston Portico became emblematic for the company, and it was used widely in its advertising. A simple example was its use on their 70-page commemorative book to mark the railway's centenary (Fig. 4.43).³⁰² Another advertising use for the portico was the commemorative bronze medal issued on the opening of the railway in 1838 (Fig. 4.44) with the same format used for the centenary in 1938. The portico then

³⁰⁰ Williams 1852, lv.

³⁰¹ Ironbridge Gorge Museum Trust correspondence pers com. Letter to Captain Moorsom asking for publicity along the line (National Archives BRB HL R/281/1) [RAIL/281/1?] (11 July 1838).

³⁰² G. Royde Smith, *Old Euston an Account of the Beginning of the London & Birmingham Railway and the Building of Euston Station* (Published by Country Life Ltd. for the London Midland and Scottish Railway), 1938.

continued as an icon for the railway. In part inspired by Philip Hardwick's prestigious Diploma Piece for admission as a Royal Academician (Fig. 4.45) but more widely known through Bourne's lithograph.

Although the advertising of the reformed London and Birmingham Railway followed a traditional tack, by the 1930s the influence of the 'Roaring Twenties' was having influence. Much of this lay in the *Exposition internationale des arts décoratifs et industriels modernes* held in Paris in 1925 and the beginnings of Art Deco. As a corollary to this W. H. Auden joined in with querying the 'romantic prejudices against the railway, praising the locomotive as the modern muse in verse inspired by the very materiality of trains, as well as by Cubism, Futurism, and jazz music'.³⁰³ It was thus that the London, Midland and Scottish Railway grasped Futurism as an appropriate movement for promoting 'streamlined' locomotives. In this A. M. Cassandre (1901-68), who was at the forefront of poster design, set an innovative approach in 1928 with his lithograph (Fig. 4.46): which one might be seen as comparable in its purpose to that of Bourne ninety years previously.

As an accompaniment to this the 1936 documentary 'Night Mail' stands out as an advertising gift to the London Midland and Scottish: in this Auden's poem is accompanied by Benjamin Britten highlighting both the clanging of piston rods with the sound of the joints of the railway track gnomically which turn the tables against those with 'romantic prejudices against the railway'. This film was dedicated to the 'Workers of the Travelling Post Office' together with 'Workers of the LMS Railway'.³⁰⁴ The influence for these statements possibly derives from the 1929 Soviet film 'Turksib' which documented the building of the Turkestan-Siberian Railway. This championing of the 'workers' acts as an overture to the post-war identity of an artisan class with a pride in its traditional skills as well as a partisanship for a named railway company.

³⁰³ Aurelien Saby, 'W. H. Auden and the Poetics of Transport', *Etudes anglaises* 2016/4 (Vol. 69) pp. 443 to 462- abstract.

³⁰⁴ The Postal Museum, *1838-1992 POST 18*.

4.7 Industrial Archaeology

The climate in the years that followed the end of the Second World War stimulated a number of changes in attitude to the industrial past. A post-industrial Britain produced a breakdown of class barriers which gave impetus towards the emancipated artisan finding self-respect in the appreciation of his history and culture.³⁰⁵ As a result, there was a regret among some against the wholesale modernisation of our industries which was taking place to meet output and pay off war debts. As former skills were supplanted there arose a growing swell of those who wished to preserve and record, and this grew into a movement.³⁰⁶ In this, working-class culture, and those familiar with the workplace and its associated heritage, proved to be a fountainhead of untapped knowledge.

At first this enthusiasm revolved around canals and railways which Nationalisation threatened and as a result, the Inland Waterways Association was formed in 1946 which was partly inspired by Tom Rolt's book 'Narrow Boat'.³⁰⁷ In 1950 Charles Hadfield's 'British Canals' sparked off a regional series of canal and railway histories.³⁰⁸ From 1960 these were jointly published by Charles Hadfield and David St. John Thomas from their own publishing house at Newton Abbott which chimed with the passing of the Public Libraries and Museums Act in 1964. This stimulated demand for a wide range of titles in which individual industries were included with case histories and manufacturing processes. These fed into the cultural awareness now manifested by the 1944 Education Act. A corollary of targeted publication was that of the republication of historic sources such as Bourne's railway lithographs in 1969 and 1970.

On the railway front, this spirit had become formalised in the foundation of the Railway & Canal Historical Society in 1954, which took a more academic view

³⁰⁵ E. P., Thompson, *The Making of the English Working Class* (Victor Gollancz Ltd, London, 1963).
Richard Hoggart, *The Uses of Literacy: Aspects of Working-Class Life* (Penguin 1957).

³⁰⁶ Kenneth Hudson, *Industrial Archaeology-An Introduction* (Baker 1966). Neil Cossons, *The BP Book of Industrial Archaeology* (David & Charles, Newton Abbott, 1993).

³⁰⁷ L. T. C. Rolt, *Narrow Boat* (London Eyre & Spottiswoode, 1944).

³⁰⁸ Charles Hadfield, *British Canals: An Illustrated History* (David & Charles Newton Abbott 1950).

towards the history of transportation. But other groups formed around more partisan interests in individual railway companies. Following nationalisation, preservation societies formed whose enthusiasms resurrected such as the Ffestiniog Railway in the 1950s. It was thus that enthusiasm and academic interest followed similar goals stimulated by an element of nostalgia.³⁰⁹

Inevitably the formula for preservation established by Woodcroft focused around artefacts so that when the National Railway Museum was established in 1975 it resulted in an imbalance towards locomotives and rolling stock. It is thus that the history of railways has been highjacked from civil to mechanical engineering in order to satisfy popular demand. Regarding the National Railway Museum and the London and Birmingham Railway the only obvious large-scale exhibits are the cast-iron gates from the Euston entrance (Fig. 2.107) which can be picked out in Bourne's illustration of the Euston Portico. Whilst Bourne's wash drawings are thankfully preserved at the NRM they are not on display, but such paper objects need a different approach to conservation.

Studies of Britain's industrial past were boosted with the organisation of historically-minded engineers and engineering-minded historians. In 1920 the Newcomen Society for the Study of the History of Science and Technology was founded 'to promote, encourage and co-ordinate the study of the history of engineering'.³¹⁰ In this, one observes a direct continuation of Woodcroft with his dedication to an historical and technical role. Although the direct study of the history of engineering was acceptable, it was its practical application that also mattered 'by 'striv[ing] after things yet to be done'.

However, in the period under discussion, the history of engineering was a separate discipline which hovered on the edge of what has been discussed above but was to feed into a particularly British phenomenon which evolved from a number of 'enthusiasms'. To some extent these received a blessing from the Workers' Education Association to be followed by Extra-mural Classes which sponsored what

³⁰⁹ Brian Taylor, 'Amateurs, Professionals and the Knowledge of Archaeology', *The British Journal of Sociology*, Vol. 46, No. 3 (Sep. 1995), pp. 499-508.

³¹⁰ 'actorum memores simul affectamus agenda'.

were loosely-termed courses around 'local history'. The participants were often those with the very skills and experiences that were being lost. As has already been implied the formality of the 'class' situation opened the door to many without formal qualifications bringing to the table much which was of benefit to their tutors ³¹¹

Although without direct reference to a collective title around these 'enthusiasm' Sir Mortimer Wheeler's statement that the archaeologist is not 'digging up *things*, he is digging up *people*; however much he may analyse and tabulate and desiccate in the laboratory, the ultimate appeal across the ages ...is from mind to intelligent mind, from man to sentient man'.³¹² From this it is safe to assume that this mixed bag of enthusiasms stated above can be titled an 'archaeology'.

Wheeler's inclusion of 'sentience' suggests a vital quality of a subject which requires those unteachable abilities of empathy with the subject matter gained through experience. Our 'mixed bag' is in many respects, beyond that of the traditional archaeologist, leaning more towards art.³¹³ In this one observes a sense of nostalgia and the romance of Bourne as a railway substitute.

To overcome this confusion, in 1955 Michael Rix coined the name of 'industrial archaeology' in *The Amateur Historian*.³¹⁴ Although perhaps an unfortunate title, which has been subject to other titles such as 'post-medieval archaeology' or the 'history of the industrial revolution' the title has stuck as being all-embracing into which railway archaeology and history can be accommodated. However, it was unfortunately picked up by the *Economist* who called it "a hobby for harmless lunatics." The title has become acceptable and gone on to receive academic credence.³¹⁵

³¹¹ John van Laun et al, 'Hill Pits, Blaenavon' *Industrial Archaeology Review* 3 (1979), pp. 258-75.

³¹² Mortimer Wheeler, *Archaeology from the earth* (Oxford University 1954), pp. 2 and 3.

³¹³ 'You are not wood, you are not stones, but men' quoted by Sir Mortimer Wheeler of Mark Anthony in the market place (*Archaeology from the Earth* (1954), p.3.

³¹⁴ Michael Rix, 'Industrial Archaeology' (*The Amateur History*, Vol. 2, No. 8, October-November 1955), pp. 225-229.

³¹⁵ Marked by the appointment of M. J. T. Lewis in the late 1960s as a Senior Lecturer in industrial archaeology at the University of Hull.

In attempts to overcome the *Economist's* gibe, the embryonic industrial archaeology turned from its subjective appeal-one might say that is one of affection-to one which created a discipline with methodologies focusing in the main around preservation, either by record or materially-the former having much in common with archaeology *per se*. To avoid this subjectivity, industrial archaeology has been clinically described as 'the systematic study of material evidence associated with the industrial past'.³¹⁶ Alternatively one might turn to the subject as one containing social realism by being 'the study of men and women at work, and their equipment and way of life' with the latter a leaning towards the aesthetic.³¹⁷

The latter definition does not easily lend itself to the stultifying intensity, which disciplines, by definition, demand. Furthermore, the romantic nature, which is not welcomed by those who would put Industrial Archaeology into a straight-jacket of methodologies, has considerable value when used intuitively. Beneath intuition there often lies experience and it is here applicable in all its guises to Bourne's London and Birmingham Railway both as evaluating the archaeological record as in Chapter 2 and aesthetically as in Chapter 3.

4.8 Revival of Bourne's Drawings

The rise of industrial archaeology in the 1950s is the general context for the revival of Bourne's *Drawings* and a renewed appreciation for the railway genre. The specific path of recovery involved several elements, including the rise of Victorian Studies as a subject and the efforts of several scholars, crucially including E. G. Hoskins, Arthur Elton, and Francis Klingender.

³¹⁶ Peter Neavenson and Marylyn Palmer, *Industrial Archaeology: Principles and Practice* (Routledge, 1998), Chapter 1.

³¹⁷ Welsh Industrial Heritage: a review based upon the proceedings of a joint Cadw/CBA conference held in Cardiff, 5 December 1986 (C Stephen Briggs (Ed.). CBA Research Report No 79) (1992).

4.8.1 Rise of Victorian Studies and W. G. Hoskins

In 1956 the American journal *Victorian Studies* was first published.³¹⁸ This was devoted to the study of English culture of the period. Whilst concentrating more on literature, social and political history, and the histories of education, philosophy, fine arts, economics, law, and science it is also interdisciplinary in its articles and included the Victorian railway.³¹⁹ In many ways this is reflective of a broadening of academic interests around the arts such as vernacular architecture which took its place alongside the polite and also admitted such as railway architecture which, in any case was a natural bedfellow to Victorian studies. On this side of the Atlantic, academic courses in Victorian studies grew and, with its corollary the Victorian railway.³²⁰

Although Victorian Studies can focus on topographical change, it was W. G. Hoskins's (1909-92) pioneering book *The Making of the English Landscape*, published in 1955 that had the greatest impact on local history studies with a topographical bias.³²¹ As I have already noted Hoskins's new discipline can be seen as describing the countryside as a series of successive layers or an 'historical palimpsest'.³²² In this one might state that the railway impressed itself onto a basically agrarian landscape but was nevertheless a part of it. However, it also extended to the urban landscape which was taken up by Hoskins, in his chapter on the 'Roads, Canals and Railways', in which he devotes a page to Dickens's description of the disruption caused by the building of the London and Birmingham Railway at Camden Town.³²³

³¹⁸ Indiana University Press from 1956.

³¹⁹ Such as 'Review: Writing on Victorian Railways: An Essay in Nostalgia', *Victorian Studies* Vol. 13, No. 1 (Sep., 1969), pp. 90-96.

³²⁰ Freeman, 1999), Robbins, 1965), pp. 215-40.

³²¹ W. G. Hoskins, *The Making of the English Landscape* (Hodder and Stoughton, 1955) followed by many reprints and editions.

³²² William Boyd: *rereading The Making of the English Landscape by WG Hoskins* (Guardian 11 May 2013).

³²³ Dickens 1848, p. 46.

In 1955 Hoskins saw a dismal world that replaced 'the immemorial landscape of the English countryside'. This 'immemorial landscape' was likewise seen by Auden, a devotee of Hoskins, as 'Tramlines and slagheaps, pieces of machinery, /That was, and still is, my ideal scenery'.³²⁴ Both were reminiscing about a scenery of 'memory' with Auden's 'ideal scenery' observed in a detached way when passing by train. This is much the way that we might look back on the steam railway: rather than remembering the specks of coal in one's eyes so memorably portrayed in 'Brief Encounter'. Likewise, Hoskins perhaps had in mind a post-war topography in which his landscape had given way 'to the villainous requirements of the new age'.³²⁵ Both Auden and Hoskins were then driven by a sense of nostalgia which I suggest Bourne invokes.

It seems strange that Arthur Elton and Francis Klingender, a Marxist, should be collaborators in a single project. In 1945 Arthur Elton had already offered a retrospective view of *British Railways* as part of the series 'British People in Pictures'. This the Editor noted as containing images which 'form a remarkably interesting commentary on a little-known side of social history' including Bourne's lithographs.³²⁶ Whilst Hoskins and Auden gave a topographical view that of Elton tended towards the social.

Despite some reference to Bourne in the advertising of the centenary, until Elton's reintroduction it seems that Bourne had receded from the public eye. One can then reasonably state that Elton's *British Railways* acted as the prelude to a revival of Bourne.

The point at which Elton became a Bourne revivalist is of interest and the making of the 'Night Mail' may have had influence. At this time, he was employed by John Grierson, the Director of the GPO Film unit. Elton had joined the Empire Marketing Board in 1931 under John Grierson as one of the 'young men, who with their contempt for easy big prizes and soft living, their taut social conscience, their rather

³²⁴ W. H. Auden, *Letter to Lord Byron in Letters from Iceland* (Faber and Faber, London 1937).

³²⁵ Hoskins 1955 pp. 231-2.

³²⁶ Arthur Elton, 'British Railways' (*Britain in Pictures*-Editor W J Turner) (Collins. London 1945).

Marxist sense of the contemporary scene seemed to me [Priestley] at least a generation ahead of the dramatic film people.³²⁷

Although not directly involved with the making of the 'Night Mail', Elton's liberal-reformer political sympathies would have identified with the dedication to the 'Workers' on both the travelling Post Office' and those of the LMS Railway. Some contact with Humphrey Jennings the film maker would appear to have had some influence on Elton through his involvement with the Exhibition entitled 'The Impact of Machines'.³²⁸ Such documentaries by Elton as *Aero Engine* (1934)-a study in the relationship between craftsmanship and manufacturing technique in the aircraft industry, helped to lay the germ that led on to Elton's enthusiasm for the memorabilia of industry and in particular Bourne whom he saw as 'perhaps the greatest industrial topographer Britain has ever had'.³²⁹ By 1956 such commercial interest was marked by a dedicated sale which included Bourne lithographs.³³⁰

This bringing together of Victorian studies and Hoskins's 'historical palimpsest' was anticipated by Francis Klingender who had appreciated the relationship between the subject matter as an historic topographical record. By 1947 this had matured into his publication of *Art and the Industrial Revolution*.³³¹ Of course, Hoskins's 'historical palimpsest' was related to the changing landscape whilst Klingender grasped a collection of historic moments. However, both were aware of the topographical change: Klingender resurrecting it through contemporary images whilst Hoskins described it through narrative.

In his 1947 edition, Klingender devoted only limited space to John Cooke Bourne's tinted lithographs. However, he had grasped the spirit of Bourne which gave expression to the protest that followed the destruction of the Euston Portico.

³²⁷ Quoted in BFI Streamline GPO Film Unit 1933-40/ Sir Arthur Elton (1906-1973).

³²⁸ George Coombs, 'The communicating Village: Humphrey Jennings and Surrealism' (Doctor of Philosophy, Liverpool John Moore University 2014), p.76-7.

³²⁹ Klingender (Elton 1968) pp. xii and xiii.

³³⁰ Sabin (1956)

³³¹ Klingender (1947).

In 1965 Elton published an article in *Country Life Annual* heralding John Cooke Bourne as the ‘Piranesi of Steam’.³³² Elton went on to publish a revision of Klingender in which he expanded Bourne to a mini-chapter.³³³ It is this which may have motivated David and Charles to republish Bourne’s *Great Western Railway* (1969) and the *Drawings of the London and Birmingham Railway* (1970).

4.8.2 Preservation and Dismay

The climate for a revival of Bourne parallels that for conservation and preservation of industrial heritage. The establishment of the Department of Industry within the National Museum of Wales in 1959 chimes significantly with the founding of the Victorian Society.³³⁴ South Wales offers a splendid example of working-class enthusiasm for industrial archaeology in which retired artisans bring first-hand knowledge and experience of mining, iron and steel manufacture, and the complexities of railway organisation, including the rivalries between the GWR and LNWR.³³⁵ Welsh enterprise was followed by the prestigious Ironbridge Gorge Museum Trust, which became home for much Bourne material inherited from Sir Arthur Elton.

Hoskins’s work created a climate for research into vernacular architecture. This awoke, along with the Victorian Society, a sympathetic view of railway architecture. With the later founding of SAVE (1979) and the writings of John Betjeman (1972),³³⁶ railway infrastructure manifestly was brought out from national obscurity. Bourne’s work was carried on such waves. His image of the Doric Portico was something of a

³³² Arthur Elton, ‘The Piranesi of the Age of Steam (John Cooke Bourne)’ *Country Life Annual*, 1965, pp.38-40. One can assume that Elton’s use of ‘steam’ must be taken in a generic sense as meaning the railway before Nationalisation.

³³³ Klingender (Elton 1968), pp.124-126, 207-209.

³³⁴ William Filmer-Sankey, *The Victorian* (1958).

³³⁵ van Laun, et al, 1978-79, pp. 258- 75.

³³⁶ Christian Barman, *Introduction to Railway Architecture* (Art and Technics) (London 1950). John Betjeman and John Gay (photographer), *London’s Historic Railway Stations* (John Murray, 1972), pp. 124-6. Marcus Binney and David Pearce eds, *Railway Architecture* (SAVE) (Bloomsbury London, 1979), pp. 140-159.

totem for successors to the London and Birmingham Railway. Architectural classicalists might argue that its value rested in its Greek Revival style.³³⁷ However, this argument cannot be sustained as the High Gothic St Pancras Station has received equal status.³³⁸ One must conclude that it was rather railway associations that mattered rather than style.

As if by way of a power game between preservationists and progressives, the Establishment supported the demolition of the Euston Propylaeum in 1961. This ignited a widespread wave of dismay³³⁹ which led on to the founding of the Railway Heritage Trust in 1985 for the preservation and upkeep of associated listed buildings and structures. The vandalism at Euston became an icon and manifesto for the preservation of railway infrastructure in general.³⁴⁰ In this it helped to bring Bourne back into the limelight in much the same way that the portico was used by the successive railway companies as a symbol for stability and safe travel; whilst other styles had different meanings which Bourne was not afraid to use where appropriate. Such was his portrayal of the Gothic Revival bridge at Rugby near the English Public School. Nevertheless, it could be related to Britton's choice of subject.

In such topics one might make some statement regarding the Battle of the Styles: Classical and Gothic. This was routed in a general debate regarding ecclesiology at the time of publication. As stated in Chapter 1, Britton's devotion towards the publication of Gothic cathedrals was not a religious mission but topographical and aesthetic. However, George Gilbert Scott's choice of High Gothic for St Pancras Station was that of an ecclesiologist allowed based on a consolation prize having

³³⁷ J Mordant Crook, *The Greek Revival. Neo-Classical Attitudes in British Architecture 1760-1870* (John Murray, 1972).

³³⁸ Simon Bradley, *St Pancras Station* (Wonders of the World 2011).

³³⁹ William Cook and Stephen Bayley, 'Should Euston Arch be raised from the dead?' (*The Spectator* 23 May 2015). The founding of the Railway Heritage Trust in 1985 stems from this (Jim Cornell, 'Conserving Railway Heritage,' *The Building Conservation Directory* (Cathedral 2003)).

³⁴⁰ Seen in John Betjemin, and John Gay, John (photographer), *London's Historic Railway Stations* (John Murray, 1972). The alternative view was expressed in British Railways (London Midland Region), *The New Euston Station 1968* (4th October 1968).

been forced beforehand to build the Foreign Office in a Classical style.³⁴¹ One can conclude that the choice of architectural style portrayed by the Bourne/Britton collaboration was one of aesthetic suitability but also governed by geographical suitability such as the incorporation of local stone or styles.

Research and writing continues on Bourne's work. Professional bodies, such as the Institute of Chartered Engineers joined in with *The Civil Engineering of Canals and Railways before 1850* in 1998. A. W. Skempton's paper on 'Cuttings and Embankments on Early Railways' makes wide use of Bourne's London and Birmingham lithographs as evidence. Skempton makes an analysis of a selection of Bourne's tinted lithographs in much the same way that I explore his drawings with other supporting material in Chapter 2: that is a mixture evolving from the archaeology of civil engineering. Another relevant publication is Chrimes paper on 'Robert Stephenson and planning the construction of the London and Birmingham Railway'.³⁴²

4.8.3 Elton Collection

Turning now to Elton's remarkable collection of industrial memorabilia. On his death in 1973, but after much hassle, these were deposited with the Ironbridge Gorge Museum Trust. Not only did this keep the full collection together, but it also affirmed their status as 'work of art'.³⁴³ No doubt the publication of both of Bourne's railway books formed a platform. It was in this spirit that following an initial exhibition held in 1980 featuring a large selection of Bourne's London and Birmingham material, it was hoped to extend this as a major feature around Bourne alone.³⁴⁴ In the early 1990s

³⁴¹ Bernard Porter, *The Battle of the Styles Society, Culture and the Design of a New Foreign Office, 1855-1861* (Bloomsbury London, 2011).

³⁴² Michael M. Chrimes, *The Civil Engineering of Canals and Railways before 1850* (Routledge 1998). Michael M. Chrimes 'Robert Stephenson and the planning the construction of the London and Birmingham Railway' (Proceedings of the First International Congress on Construction History. Madrid 20-24 January 2003). Also Skempton 1996, pp. 33-49.

³⁴³ Michael A. Vanns, *Witness to Change. A Record of the Industrial Revolution. The Elton Collection at the Ironbridge Gorge Museum* (Ian Allan. 2003).

³⁴⁴ Ironbridge Gorge Museum Trust, 'The Navvies Build, J. C. Bourne's railway drawings and other works from the Elton Collection, (Coalbrookdale, 1980) Such are the signatories to the

attempts were made to mount such an exhibition: from the correspondence it can be gleaned that the assemblage of Bourne material included his later watercolours.³⁴⁵ In spite of exhaustive lobbying, including some funding, this proposal came to nought until 2015, with an exhibition and part catalogue.³⁴⁶

This was preceded by my own seven-part series on the *Drawings of the London & Birmingham*.³⁴⁷ To establish my claim I made use of the previously unexploited wash drawings made by Bourne along the line. As already stated these are unique in being personally copied by Bourne onto the lithographic stone from which they were printed. The important point is that as a combined source, and by comparison between the two we can be reasonably assured of their archaeological content. Unlike Bourne's often more prized Great Western Railway, their completeness of being a full record-wash drawings and selected tinted lithographs-makes them a unique preserved record of an early railway under construction. This matter of their conservation has already been discussed in Chapter 1.

Undoubtedly the enthusiasm for Bourne owes much to the republication of both of his railway lithographic volumes which occurred a few years before Elton's death. Elton's own enthusiasm for Bourne is apparent immediately post-war and was soon to be joined by the rediscovery of the significance of Britain's industrial past. This reached a highpoint in 1968 with the establishment of Ironbridge which was followed by the republication of Bourne's works. This event was reinforced by Elton's collection with its Bourne memorabilia finding a home at Ironbridge.

Despite much enthusiastic acclaim this has partly faded. However, the entanglement of Elton, post-war discovery of industrial archaeology, demolition of iconic railway

Bourne's L & B Railway lithographs (AE185. 6/707). It should be noted that the importance of the history of engineering drawing had been previously realised in the *Art of the Engineer* 1978.

³⁴⁵ Correspondence David de Haan (Ironbridge Gorge Museum).

³⁴⁶ Matt Thompson *The Picturesque Railway-The Lithographs of John Cooke Bourne* (History West Midlands 2015).

³⁴⁷ John van Laun 'John Cooke Bourne (1814-1896) lithographer: Drawings of the London & Birmingham Railway (1836-1838),' *Journal of the Railway & Canal Historical Society*, Nos. 219 to 225, March 2014 et seq.

structures have revived favour for Bourne originals and reprints (Fig. 4.47). However, the future for the London and Birmingham Railway as built is not rosy leaving the *Drawings* as an archaeological substitute. As far as one can tell the archaeological assessment being made appears to be that made by 'digging up the past' rather than assessing documentary and standing structure evidence which leaves much evidence intact.

4.9 Chapter Conclusion

In this chapter, I examined the afterlife of Bourne's *Drawings* and their revival within the context of industrial archaeology. The relationship is intimate between Bourne's post-war revival and the rise in interest for Britain's history of civil and mechanical engineering. Champions of such, especially Arthur Elton, revived Bourne's work and promoted it far beyond an antiquarian interest. To a considerable extent, I follow Elton's tradition in my own interest balancing the history of art and the history of engineering. I share Elton's interest with attempting to extract knowledge about process from works of art. I also share his production-based focus on those works of art themselves.

In this chapter, I also offer some material related to Bourne's later biography and his other artistic endeavours, such as his use of photography in Kiev. I hypothesise his interest in photography was a spin-off from his method of transferring wash drawings directly onto stone for printing.

Conclusion

The focus of this thesis has been the uniqueness of John Cooke Bourne's drawings of the London and Birmingham Railway. Despite depicting what was seen to be an 'unpromising subject of a railway, with all its mechanical and commercial associations' its presentation in a large format and use of a novel media made it a prestigious book which matched other topographical publications which could 'grace the drawing-room table.' In modern terms it would therefore be seen as a coffee-table book. Whilst railway illustrations had proved popular in a small format, such a status-claiming publication on railways was a new venture.

Although this was a unique selling point its purpose was derived for other reasons which provides the title of this study. Railway topography and politics - as applied to Bourne's *Drawings* - were interdependent both through the commonality which can be found in the subject matter and the cooperation of the two principals – Britton and Bourne. The former was an experienced topographical commentator with a mission for Free Trade. Bourne was initially drawn to record the excavations at Camden *con amore* as the Euston Extension edged its way through the suburbs towards its terminus.

Through the evolving railway system Britton found a novel topographical approach which chimed with the Great Reform Act of 1832, In this Bourne was his collaborator. In a sense Britton was promoting a new genre around the railway which would be as acceptable as his large-scale studies around such topographical works as his *Cathedral Antiquities* published at the time³⁴⁸ Furthermore, he was likely to have been aware of Bourne's sketches of the Euston Extension through his map-making enterprise at Marylebone.³⁴⁹

³⁴⁸ John Britton, *Cathedral Antiquities: Historical And Descriptive Accounts, With 311 Illustrations, of the Following English Cathedrals. Viz, Canterbury, York, Salisbury, Norwich, Oxford, Winchester, Lichfield, Hereford, Wells, Exeter, Worcester, Peterborough, Gloucester, And Bristol* (London, 1836).

³⁴⁹ Britton *Topographical Survey* (1837).

The suitability of tinted lithography, as well as the large-scale format, is likely to have come from J. D. Harding's *Home and Abroad* which was published at just the time that Bourne was embarking on his railway drawings. However, Bourne was obviously influenced by his contact through Ackermann's *Complete Course in Lithography* (1819) and Charles Hullmandel's *The Art of Printing on Stone* (1824) both of whom were closely involved through publication and printing of the *Drawings*. Lithography was therefore comparatively well-known to the engraver-trained Bourne but Harding's quality publication in 1836 clinched the choice of medium which was endorsed by Britton.

Whilst Bourne's and Britton's collaboration was coloured by Britton's political ambitions it was common to both to make a commercial success of the project. In this Ackermanns were joint publishers and may have been influential in the choice of medium. The formula for the *Drawings* followed a selection based on the portfolio produced by June 1838 which followed a year-long campaign which was padded out by a few additions to fill discards.

It must be assumed that those up to June were composed at will by Bourne from which the section was weeded out by Britton and the shortfall filled at Britton's behest. It therefore seems likely that Bourne had a fixed stylist approach which might or might not fit the client's brief.

Even so once production was under way there were four periodic issues by subscription to test the market and provide capital for the next issue. Britton's description was composed nearer the time of the final issue when the lithographic content was by then known. It is these matters which undoubtedly suggest that the choice of content was largely down to Britton. However, it is with Bourne that the book is mainly associated and it has been suggested that it caused some pique on Britton's part that he had not been given more credit.

As one turns the pages of the *Drawings* one can see why Bourne received the credit that he still does and why so many copies have been broken for their contents or many coloured. Although this does not appear to have been Bourne's intention the reason they are often viewed as individual art works is due to the unique way of printing tinted lithographs – of course some must be due to being from the four parts

rather than broken volumes which surely suggests that they were individually prized. This prizing of individual prints must be credited to the two lithographic printers involved through their innovative techniques – Charles Hullmandel and Day and Haghe whose names stand out in nineteenth-century lithography.

As with other landscape genre the object was to convey verisimilitude. We saw that landscape art had in the late eighteenth century evolved from Edmund Burke's 'Philosophical Ideas' and Gilpin's Picturesque which provided an alternative to Continental travel at the time of the French Wars. However, 'truthfulness' was variable and governed by cultural differences and in this Bourne with Britton hit on an ideal with general appeal.

Nevertheless, where the London and Birmingham Railway was concerned, a number of media were used by others all of which have their own appeal. Such were the aquatints of the railway by Bury with their tendency towards a hangover from sporting and coaching prints, with which the public of the time were familiar and therefore found verisimilitude. However, there were other media employed: such were those by Scharf who was the first on the artistic scene and making annotated sketches of the permanent way in the style of his London life images. In this he acted as a halfway house to Stephenson's engineering drawings which were accurate but objective. In contrast there were the watercolours by Schnebbelie who produced charming images of the railway in a style reminiscent of Constable which gave atmosphere approaching a kind of emotional verisimilitude to the observer. However, in Bourne one has a pictorial accuracy which contain emotion with an affinity to the aesthetics of the times. Furthermore, although Bourne departed into the extremes of tunnel interiors such were acceptable as examples of mankind's' achievements - a selling point about this railway. However, in general Bourne tempers his railway illustrations by making them part of the landscape into which it blends as if one of the layers of a disguised landscape.

Bourne's attention to detail can be seen in a number of ways. Such are his drawing of the Primrose Hill Tunnel (Fig. 2.26) or the two studies at Tring Cutting (Figs. 3.81 and 3.82) made in preparation of the composite tinted lithograph (Fig. 3.83).

Other examples are his delightful studies of workmen (Fig. 2.53 to 2.57) which can be picked out in Fig. 2.54 which gives textbook examples of building a revetment: another is the detail in Fig. 2.19 which can be evaluated to explain the exact method of laying track. In a sense these are alternatives to Scharf's annotated drawings but Bourne's stand as works of art in their own right.

Apart from such textbook detail one can find this incorporated into a narrative as at Kilsby Tunnel which was the highpoint of engineering achievement on the railway and worthy of being a statement of success. In these one sees the winding engine in great detail (Fig. 3.41 with the lithograph 3.42) from which its workings can be evaluated. On the surface are the pump-rods which drained the underground workings one of the major problems with driving the tunnel. From here one is transported by a kibble to the bottom of a shaft which was under construction (Fig. 3.40).³⁵⁰ At the bottom the full atmosphere is portrayed with its haze. There are then in this narrative a mixture of moods which ultimately embrace the Sublime.

In the Sublime can be found elements of the Gothic - a late choice possibly that made by Britton with his cathedral interests (Figs. 3.50 et seq). However, Bourne's architectural choices side with the classical and possibly more influenced by the Greek Revival. This is borne out by his studies of the Euston Portico then being built (Figs. 2.104 and 2.105) to which Bourne returned over a six-month period until its completion. Also related are those that appear as geological studies (Figs. 3.26 and 3.28) at Blisworth Cutting a well-known spot for fossil collecting.

With such a smorgasbord of media choices it is not surprising that Britton the archaeologist, antiquary and topographer was drawn to Bourne's style. Although most of those wash drawings made by Bourne of the Euston Extension were rejected it is still likely that they were the initial attraction for Britton who saw the potential of these as tinted lithographs which Bourne was equally able to produce. One sees this talent in action with the change made of the *Oblique Bridge at, Box Moor*, (Figs. 3.24 and 3.25) which was modified by additions to the same print stone which remained 'same size'.

³⁵⁰ An iron bucket used in wells or mines for hoisting water, ore, or refuse to the surface. Often used by navvies to descend or ascend.

It is through such adaptability that Bourne became involved with the use of photography in Russia under Roger Fenton. In this it is tempting to speculate that Bourne may have devised a related method in the rapid recording for the *Drawings* and their transfer onto stone.

It was Bourne's experiments with photography that followed his vindication of the Railway Mania through his tinted lithographs of the Great Western Railway: in this he too used direct transfer of his preparatory wash drawings on to the print stones (Fig. 4.21). Although no direct correlation has been found, the laudatory title given to Turner's celebrated painting 'Rain, Steam, and Speed - The Great Western Railway' of a similar date suggests some causality. Bourne's Great Western Railway also points to a more mature style of railway genre which includes locomotives: this became more popular than the *Drawings* and so they remain. In this one must consider the difference in objectives in which the *Drawings* were political.

Although Bourne's tinted lithographs never disappeared into oblivion, his wash drawings of the London and Birmingham Railway were secreted at Wolverton Carriage and Wagon Works until revealed again post-WWII. By then, attitudes to railway memorabilia had changed towards that of appreciation and when dispersed they were ultimately assigned to the National Railway Museum.

Apart from their survival at Wolverton, which gives credence to the supposition that the publication of Bourne's *Drawings* had the support of the railway company, it also throws light on a change in attitude to the industrial past.

Whilst one can find a preservationist attitude to the artefacts of the railway which became the basis of the Science Museum, one can also see them as exemplars for the artisan class in a Smilean 'self-help' way. While this spilt over into affection for different railway companies culminating in the Big Four, industry was understandably viewed in the inter-war period differently. Up until WWI such industries had been part of British nationalist pride, but post-war recession brought industrial despair and rejection of the seeds of a Victorian age.

However, post Second World War reorganisation under a Labour Government brought a rationalisation of industries in which former skills were replaced by modernisation and the railway network revamped to meet different transport needs.

But this also brought some regret as former skills were replaced and the community-based workplace dismantled. The result was a growth in working class pride in the skilled occupations of the past in which recognition of the workplace placed as a cultural inheritance made it worthy of preservation. Academic study followed and industrial archaeology was accepted as a discipline.

This unique phenomenon was largely derived from Britain's place as the exporter of railways which brings us back to the *Drawings* which stand as a political and artefactual substitute for the dawn of the trunk railway which served the Workshop of the World.

A measure of this was the result of the demolition of the Philip Hardwick's Euston Portico which stood as the icon of the railway bringing with it attention to the *Drawings*. Furthermore, the recovery of the wash drawings from obscurity became an inter-departmental battle as to their assignment.

However, these factors stem from the enthusiasm of Arthur Elton and Francis Klingender – one the baronet and the other the Marxist - but both with an affinity for industrial history in which they collaborated. Elton was particularly dedicated to Bourne whom he had summed up as the 'Piranesi of Steam'.

This obvious reference to the aesthetic appeal of Bourne was reawakened as early as 1945 when Elton declared his interest in Bourne with *British Railways* which was followed by Klingender's *Art and the Industrial Revolution* in 1947. This Elton revised and extended with a sub-chapter on Bourne in 1968. By 1956 the commercial value of Bourne was well underway with the print specialist Frank Sabin producing a catalogue *Early Railways*.

With Elton and Klingender at the helm they were never far apart in their combined interests in industrial archaeology and its relationship to working class history. On Elton's death this was realised in the Elton Collection being passed to the Ironbridge Gorge Museum Trust with its strong representation of Bourne material and the exhibitions referred to followed in 1980. However, the strongest vindication was the republication of the *Drawings*.

Today one can look on the railway genre, as depicted by Bourne, as being equal to the 'grand manner' by being examples of Britain's historical achievements through

industry. Supported by such as Turner's Great Western Railway' it stands up to the eighteenth-century history painting that glorified British achievements. Furthermore, the use of lithography, whilst not acceptable in the 'canon' of art at the time, is so today.

This thesis also raises some questions for further study. For instance, several of Bourne's working processes may have some bearing on early photography. In addition, one is left wanting more discussion of the relationship between the commonality of Bourne's popularity in the period of the growth of railways and that of their demise. There is, however, a *caveat* around the present-day enthusiasm for industrial archaeology and its derivatives. This questions whether that enthusiasm will survive as environmental conservation becomes a priority from which the 'celebration' alluded to in this thesis returns to being an historical blight in parallel to the Depression of the 1930s. What we once celebrated seems to be becoming something we denigrate. This cycle, itself, that makes for an interesting historiographical study.

Bibliography

This bibliography includes all citations appearing in footnotes.

B1 Acts of Parliament

3 Gul IV Cap. xxxvi. [May 1833].

House of Commons (HC Deb 18 July 1978 vol 954 cc460-70b).

5 & 6 Gul. IV. Cap. lvi.

Patent Law Amendment Act (15 & 16 Victoria 1852).

B2 Exhibitions and Galleries

Architects for a New Age. Exhibition catalogue. London: Fine Art Society in association with Haslam & Whiteway, 2008)

British Transport Commission, *Transport treasures: booklet of exhibition 1956* (published 1962).

‘Constable, Gainsborough, Turner and the Making of Landscape ‘ (Royal Academy 8 December 2012-17 February 2013).

Ironbridge Gorge Museum Trust, *The Navvies Build, J. C. Bourne’s railway drawings and other works from the Elton Collection* (Coalbrookdale, 1980).

The Romance of the Stone: Lithography, 1796-1825 – September 16, 1996-January 11, 1997, (The New York Public Library Center for the Humanities)

Sabin, Frank T., *Early Railways, Catalogue of an Exhibition* (London 1956).

[Scharf] *George Scharf-- from Regency Street to Modern Metropolis* (Jerzy J Kierkuc-Bielinski - Soane Gallery and British Museum 2009).

B3 Primary Sources: Books

Ackermann. Rudolph. *The microcosm of London*. London : Published at R. Ackermann's Repository of Arts, 101 The Strand, 1808-10. [Ackermann] *Rudolph Ackermann's Microcosm of London* (London, 1808-10).

(Bourne) The History and Description of the Great Western Railway; including its Geology and the Antiquities of the District through which it passes, accompanied by a Plan and Section of the Railway, a Geological Map, and by numerous Views of its principal Viaducts, Tunnels, Stations, and of the Scenery and Antiquities in its Vicinity, from Drawings taken expressly for this work, and executed in lithography by John C. Bourne (London: David Bogue, 1846).

Barlow, Peter, *Second report addressed to the directors and proprietors of the London and Birmingham railway company* (London. B. Fellows 1835).

Barlow, Henry Bernoulli, *A comparative account and delineation of railway engine & carriage wheels* (John Weale 1848).

Brees, S. C. [Stanley Charles], *Railway Practice. A Collection of Working Plans and Practical details of Construction* (London 1838).

Britton, John, *The beauties of Wiltshire: displayed in statistical, historical, & descriptive sketches, illustrated by views of the principal seats &c, with anecdotes of the arts* (London, 1801).

Britton, John, *The Fine Arts of the English school, illustrated by a series of engravings from paintings, sculpture and architecture of eminent English artists* (London, 1812).

Britton, John, *The union of architecture, sculpture, and painting: exemplified by a series of illustrations, with descriptive accounts of the house and galleries of John Soane* (London, 1827).

Britton, John, *Architectural Antiquities of Great Britain* (9 vols, 1805-1814) and *Cathedral Antiquities of England* (14 vols, 1814-1835, London).

Britton, John, 'Topographical Survey of the Borough of St. Marylebone, as Incorporated & Defined by Act of Parliament 1832. J. Britton, 25 June 1834 (London. Published June 25, 1837)'.

Britton, John, *Cathedral Antiquities: Historical And Descriptive Accounts, With 311 Illustrations, of the Following English Cathedrals. Viz, Canterbury, York, Salisbury, Norwich, Oxford, Winchester, Lichfield, Hereford, Wells, Exeter, Worcester, Peterborough, Gloucester, And Bristol.* (London, 1836).

- Brownrigg, William. *John Dalton, A descriptive poem, addressed to two ladies, at their return from viewing the mines near Whitehaven* (London 1755).
- Buck, George Watson, *A Practical and Theoretical Essay on Oblique Bridges* (John Weale Architectural Library, 1839).
- Buckland, William, *Geology and Mineralogy considered with reference to Natural Theology* (Bridgewater Treatise 1836).
- [Bullard] *A catalogue of the collection of prints from the Liber Studiorum of Joseph Mallord William Turner /formed by the late Francis Bullard, of Boston, Massachusetts, and bequeathed by him to the Museum of Fine Arts in Boston* (Boston 1916).
- Burke, Edmund, *A Philosophical Enquiry into the origin of our ideas of the Sublime and beautiful* (London 1757).
- Bury, Thomas Talbot, *Coloured Views on the Liverpool and Manchester Railway, aquatints by S. G. Hughes and H. Pyall* (London, R. Ackermann, 1831).
- Bury, Thomas Talbot, *Six Coloured Views on the London and Birmingham Railway, from Drawings Made on the Line with the Sanction of the Company, Part I* (Ackermann & Co., 1837).
- Carmichael, J. W., *Views on the Newcastle and Carlisle Railway / from original drawings by J. W. Carmichael; with descriptions by J. Blackmore, engineer to the Company* (Newcastle: Currie and Bowman 1839).
- Cary's New Plan of London and Vicinity (source: *Published by the Authority of His Majesty's Post Master General* 1837).
- [Cheffins] *London & Birmingham railway: plan of the line and adjacent country* (London: C. F. Cheffins, 1835).
- [Cheffins] *London and Birmingham Railway: Map of the Railway from London to Box-Moor, and the adjacent Country* (London: Charles F. Cheffins, 1 August 1837; 1838 edition with Thomas W. Streeter).
- Cheffins's Official Map of the Railway from London to Birmingham, Manchester and Liverpool* (Wrightson & Webb. 1839).
- Dickens, Charles, *Dealings with the Firm of Dombey and Son: Wholesale, Retail and for Exportation* (Bradbury & Evans, London, 1848).
- [Drake], *James Drake's road book of the London and Birmingham and Grand Junction Railways: being a complete guide to the entire line of railway from London to Liverpool and Manchester...: to which is appended the visitor's*

- guide to Birmingham, Liverpool, and Manchester* (London, Hayward and Moore..., [1839].
- Dempsey, George Drysdale, *The practical railway engineer. Examples of the mechanical and engineering operations and structures combined in the making of a railway* (London, Weale, 1847)
- [Earldon] *Liber Veritatis; or A Collection of Prints after the original designs of Claude le Lorrain; in the collection of His Grace the Duke of Devonshire. Executed by Richard Earlom in the Manner and Taste of the Drawings 1777*
- Francis, John, *A history of the English railway, its social relations and revelations. 1820-1845* (London, 1851).
- Freeling, Arthur, *The Grand junction railway companion to Liverpool, Manchester, and Birmingham* (Liverpool, H. Lacey, 1837).
- Freeling, Arthur, *The London and Birmingham Railway companion: containing a complete description of everything worthy of attention on the line..: also fares and time tables: with a map* (London, by Whittaker and Co.....,[1838]).
- Gilpin, William, *Observations on the river Wye, and several parts of South Wales, &c., relative chiefly to Picturesque beauty: made in the summer of the year 1770* (London 1792).
- Gilpin, William, *Three essays: on Picturesque beauty, on Picturesque travel, and on sketching landscape: to which is added a poem, on landscape painting* (London, 1794), 2nd edition.
- Godwin, George, *An appeal to the public, on the subject of railways.* (London 1837)
- Groombridge, R., *Handbook for Travellers along the London and Birmingham Railway* (London 1839).
- Harding, James Duffield, *Sketches as Home and Abroad* (London, 1836).
- Harding, J. D., *Elementary Art* (London, 1838).
- Hodgkinson, Eaton, *Theoretical and experimental researches to ascertain the strength and best form of iron beams* (Manchester, 1832).
- Hogarth, William, *Analysis of Beauty* (London 1751).
- [Horwood] *Richard Horwood's PLAN of the Cities of LONDON and WESTMINSTER the Borough of SOUTHWARK, and PARTS adjoining Shewing every HOUSE* (1792-9).

Jeaffreson, John Cordy, *Life of Robert Stephenson with descriptive chapters on some of his most important professional works* (2d ed. London, 1866) volume 1.

[Jones] John Britton (T E Jones), *The auto-biography of John Britton, copiously illustrated* (London, 1850) (in one volume).

Knight, Richard Payne, *The Landscape: a didactic poem in three books: addressed to Uvedale Price* (London 1795).

(Landseer), John Landseer ARA, *Lectures On The Art Of Engraving, Delivered At The Royal Institution Of Great Britain, - By John Landseer, Engraver To The King, And F.S.A.* (London, 1807).

Lauder, Thomas Dick, *Sir Uvedale Price, On the Picturesque: with an essay On the origin of taste, and much original matter* (Edinburgh 1842).

Lecount, Peter, *A practical treatise on railways, explaining their construction and management... being the article 'Railways' in the seventh edition of the Encyclopedia Britannica, with additional details* (A. C. Black, Edinburgh, 1839).

Lecount, Peter, *The History of the Railway Connecting London and Birmingham: Containing Its Progress from the Commencement. To which are Added, a Popular Description of the Locomotive Engine; and a Sketch of the Geological Features of the Line* (Simpkin, Marshall, and Company, 1839).

Lyell, Charles, *Principles of Geology* first published 2 volumes 1830 to 1833 (John Murray, London).

Martin, John, *The Paradise Lost of Milton, with illustrations designed and engraved by John Martin* (London 1827)

Osborne, Edward Cornelius and William, *Osborne's London and Birmingham Railway guide*. Illustrated (Birmingham and London 1840).

Paterson, Daniel, *Paterson's British Itinerary Being A new and accurate Delineation And Description of the Direct and Principal Cross Roads Of Great Britain* (Carington Bowles (London, 1785).

[Phillips] Richard *Phillips's Modern London; being the history and present state of the British Metropolis* (London 1804).

Pope, Alexander, *An epistle to the Right Honourable Richard, Earl of Burlington* (London 1831) first published 1732.

- Price, Sir Uvedale, *An essay on the Picturesque, as compared with the Sublime and the beautiful: and, on the use of studying pictures, for the purpose of improving real landscape* (London, 1796).
- [Pye] *Notes and memoranda respecting the Liber studiorum of J.M.W. Turner, R.A., written and collected by the late John Pye. Edited, with additional observations, and an illustrative etching, by John Lewis Roget* (London 1879).
- Reynolds, Sir Joshua, *Seven Discourses delivered in the Royal Academy* (London 1778)
- Roscoe, Thomas, *The London and Birmingham railway, with the home and country scenes on each side of the line* (Charles Tilt, London 1839).
- Senefelder, Alois, *A complete course of lithography: containing clear and explicit instructions in all the different branches and manners of that art: accompanied by illustrative specimens of drawings. To which is prefixed a history of lithography, from its origin to the present time. By. With a preface by Frederic von Schlichtegroll. Translated from the original German, by A. S.* (London, R. Ackermann, 1819).
- Simms, Frederick Walter, *Public works of Great Britain...* (John Weale London 1838).
- Simms, Frederick Walter, *Practical tunnelling: explaining in detail....* (London 1844).
- Smiles, Samuel, *Lives of the Engineers, with an Account of their Principal Works; Comprising also a History of Inland Communication in Britain* (John Murray 1861).
- Smiles, Samuel, *The life of George Stephenson, railway engineer* (London: J. Murray, 1857).
- Smiles, Samuel, *Self-help with illustrations of character and conduct* (John Murray, London, 1859).
- Steuart, Sir Henry, *The Planter's Guide; Or, A Practical Essay On The Best Method Of Giving Immediate Effect To Wood* (John Murray, London (1828).
- Stevenson, David, 'Observations on the Liverpool and Manchester Railway' *Edinburgh New Philosophical Journal*, October 1834...April 1835, (Edinburgh 1835).
- Stowe: *a description of the magnificent house and gardens of the Right Honourable Richard Grenville Temple, Earl Temple, Viscount and Baron Cobham* (London 1773).

Stuart, James and Revett, Nicholas, *The Antiquities of Athens* many editions since 18th century.

Tredgold, Thomas, *Practical Essay On the Strength of Cast Iron, And Other Metals... Containing Practical Rules, Tables, And Examples; Founded On a Series of New Experiments, With an Extensive Table of the Properties of Materials. 3d ed., improved and enl.* (London 1831).

Turner, J. M. W., *Picturesque views in England and Wales* (London, 1827-38).

[Twamley] *Wanderings in South Wales, with Louisa Anne Twamley the naturalist* (1837).

Walker, James Scott, *An Accurate description of the Liverpool and Manchester Railway* (Liverpool, 1831).

Weale, John, *Quarterly papers on engineering. Edited and published by John Weale* (London 1844-49).

Whishaw, Francis, *The Railways of Great Britain and Ireland practically described and illustrated* (J. Wheale, London, 1842).

Williams, Frederick S, *Our iron roads: their history, construction and social influences* (London. 1852).

Wood, Nicholas, *A Practical Treatise on Rail-Roads, and Interior Communication in General; with Original Experiments, and Tables of the Comparative Value of Canals and Railroads. Illustrated by Engravings.* (London, 1825).

Woodcroft, Bennet, *A sketch of the origin and progress of steam navigation from authentic documents* (London 1848).

Woodcroft, Bennet, *Patents for Inventions. Abridgement of Specifications relating to Railways. AD1770-1863.* (London: Eyre and Spottiswoode, 1868).

[Wyld, James] J. W. W. *The London and Birmingham railway guide, and Birmingham and London railway companion: containing a minute description of the railroad, and every object worthy of notice; an antiquarian and topographical account of the towns, villages, noblemen and gentlemen's seats, within ten miles of the railroad.* (London: J. Wyld, 1838).

B4 Primary Sources: Other Printed Sources

Arnold's Magazine of the Fine Arts, and Journal of Literature and Science., new series: v. 3 (Nov. 1833-Apr. 1834) (London 1834).

[Cheffins] 'Memories of Charles Frederick Cheffins' in: *Proc. ICE. Institution of Civil Engineers (Great Britain). Volume 21. (1861/2).* pp. 578-80.

Civil Engineer and Architect's Journal, The (September 1839), p. 35.

R. B Dockray, *Minutes of the Proceedings of the Institute of Civil Engineers* 1849 pp.165 – 173.

Minutes of the Proceedings of the Institute of Civil Engineers, Volume 8 (1849) (R. B. Dockray), Volume 21 1861-62. 'Memoir' pp. 578-80, Volume 25, Issue 1866, 01 January 1866, pages 519-522.

Ecclesiologist 1857, p. 70.

Gentleman's Magazine June 1838, September 1839, p. 291 and 419.

Gentleman's Magazine Literary Advertiser, 164, June 1838.

[Geological Society] *The Proceedings of the Geological Society of London* (v.1.1834-1845] 1840, p. 473) also p.460.

Great Western Progress 1835 – 1935 (Great Western Railway Paddington 1935)
[Fig. 4.43]

Herapath's Railway Journal Volume 2. (1837), p. 191 [Loudon, J. C].

[Magazine] *The Architectural Magazine and Journal*, Volume V (London, 1838 -39), pp. 610 - 11.

Mechanics Magazine 7 November 1835 (639), pp. 98-99, 700 Jan 7 1837, 713 April 8 1837, 720 May 27 1837.

Morning Post 7 July 1829.

[Photographic] *Journal of the Photographic Society*. The No 1. March 3, 1853, pp. 3 and 5, 1855/56, pp. 284-291.

Peel Banquet, 'Speech of Sir R. Peel... at Glasgow, Jan. 13, 1837' (Constitutional Office. Argyle Street, Glasgow).

Royal Academy Council Minutes

Royde Smith, G., *Old Euston an Account of the Beginning of the London & Birmingham Railway and the Building of Euston Station*, (Country Life Ltd. for the London Midland and Scottish Railway 1938).

Staffordshire Advertiser (30 January 1836) (British Newspaper Archive).

Spectator, No. 414(June 25, 1712) and 477 September 6. 1712.

Stevenson, David, 'Observations on the Liverpool and Manchester Railway' (*New Philosophical Journal*, October 1834 _ Edinburgh April 1835), pp 323 - 4.

Tait, A. F., *Views of the Manchester and Leeds Railway* (Liverpool 1845)

Wordsworth, William, 'On the Projected Kendal and Windermere Railway': A Poem, 6 October 1844 in the *Morning Post*.

B5 Primary Sources: Published Reports

R. R. Angerstein (translated by Torsten and Peter Berg), *R. R. Angerstein's Illustrated Travel Diary, 1753-1755: Industry in England and Wales from a Swedish Perspective*, (Science Museum 2001).

BHO British History Online, ('Euston and Works LXXIV).

Bailey Michael and Glithero, John, *The Engineering and History of 'Rocket': A Survey Report* (Science Museum 2000).

[Briggs] *Welsh Industrial Heritage: a review Based upon the proceedings of a joint Cadw/CBA conference held in Cardiff, 5 December 1986* (C Stephen Briggs (Ed.). CBA Research Report No 79) (1992).

Chrimes, Michael M., 'Robert Stephenson and planning the construction of the London and Birmingham Railway', *Proceedings of the First International Congress on Construction History, Madrid, 20th-24th January 2003*, ed. S. Huerta, Madrid: I. Juan de Herrera, SEdHC, ETSAM, A. E. Benvenuto, COAM, F. Dragados (2003), pp. 593 - 609.

Connelly, Angela and Hebbert, Michael, 'Liverpool's Lost Railway Heritage' (*MARC Discussion Paper. Manchester Architecture Research Centre, University of Manchester 2011*).

Cook, William and Bayley, Stephen, 'Should Euston Arch be raised from the dead?' (*The Spectator* 23 May 2015).

Cornell, Jim, 'Conserving Railway Heritage' (*The Building Conservation Directory*) Cathedral 2003).

Gwyn, David and Cossons, Neil, EARLY RAILWAYS IN ENGLAND: Review and summary of recent research (*Historic England, Research Report Series no. 25-2017, 3.4*).

Historic Railways and Structures -10 Cast Iron Bridges. (National Heritage Protection Plan 4B3 RPS group).

Strickland, William, *Reports on Canals, Railways, Roads, and Other Subjects*, published by H. C. Carey and I. Lea of Philadelphia in 1826.

B6 Primary Sources: Additional Archive Materials

British Railways Board HL R/281/3

National Archives AN111/598, Historical relics: custody of drawings by J C Bourne commissioned by London and Birmingham Railway in 1837 showing construction of railway, 1971 May 1 - 1975 Nov 30, 24-7-2A.]

National Museum of the History of the Ukraine, Kiev National Museum of the History of the Ukraine, Kiev

National Railway Museum-pictorial collection (railway). 1990-7189 to 1990 – 7255.

Royal Academy Collection 06/3132, 18 January 1840. Council Minutes, IX, 92. Cf. RA Accounts, Quarterly Abstract of Bills, Xmas 1839 to Lady Day 1840: 'Paid J. Britton for Books E6.2.0.'

Royal Academy Collections. George Johann Scharf (1788 - 1860): People and Organisations.

Royal Collection RCIN 2800094 [Stephenson] Photograph by Claude-Marie Ferrier of a steam locomotive inscribed "Stephenson & Co Engineers, Newcastle. South Eastern Railway London to Paris, Folkestone & Boulogne & Dover & Calais. Crampton Patentee'.

Tring Local History; the 'Train Now Departing', *Notes and Extracts on the history of the London and Birmingham Railway* (<https://tringhistory.tringlocalhistorymuseum.org.uk/Railway/>
(<https://tringhistory.tringlocalhistorymuseum.org.uk/Railway/>)

B7 Secondary Sources

Altick, Richard, *London Review of Books* Volume 9, No. 19 (29 October 1987) 'Street Wise'.

Andrews, Malcolm, *The Search for the Picturesque* (Stanford University Press, 1989).

W. H. Auden, *Letter to Lord Byron in Letters from Iceland* (Faber and Faber, London 1937).

Bailey, Michael R., *Robert Stephenson - The Eminent Engineer* (Routledge 2003) (James Sutherland 'Iron Railway Bridges', pp. 304-308).

Baldwin, Gordon, Malcolm, Daniel, and Greenough, Sarah, [et al] *All the Mighty World: The Photographs of Roger Fenton, 1852-1860* (Yale, 2004).

- Barman, Christian, *Introduction to Railway Architecture (Art and Technics)* (London 1950).
- Benezit Dictionary of British Graphic Artists and Illustrators* (Oxford University Press 2012).
- Betjemin, John and Gay, John (photographer), *London's Historic Railway Stations* (John Murray, 1972).
- BFI Streamline GPO Film Unit 1933 -- 40/ Sir Arthur Elton (1906-1973).
- Binney, Marcus and Pearce, David, eds., *Railway Architecture (SAVE)* (Bloomsbury London, 1979).
- Birtchnell, Percy, *A Short History of Berkhamsted*. (The Bookstack Cleveland. ISBN 1-871372-00-3).
- Bourne's London & Birmingham Railway* (David & Charles, Newton Abbott 1970)
- Boyes, Grahame, Searle, Matthew and Steggles, Donald, *Ottley's Biography of British Railway History (Second Supplement)* (National Railway Museum York 1998).
- (Boyd) 'William Boyd: rereading The Making of the English Landscape by W.G. Hoskins' (Guardian 11 May 2013).
- Bradley, Simon, *St Pancras Station* (Wonders of the World, 2011).
- British Railways (London Midland Region), *The New Euston Station 1968* (4th October 1968).
- Buchanan, R. A., 'The Rise of Scientific Engineering in Britain', *The British Journal for the History of Science* (Vol. 18, No. 2 (Jul., 1985), pp. 218-233).
- Cain, Joe, 2013, *History of a London Street, Euston Grove*
<https://profioecain.net/euston-grove-london-wallis-guide-stranciers>).
- [Camden] London Borough of Camden, *We are Camden* (2013).
- Chrimes, Michael M., *The Civil Engineering of Canals and Railways before 1850*. (Routledge 1998).
- Coombs, George, 'The communicating Village: Humphrey Jennings and Surrealism' (Doctor of Philosophy, Liverpool John Moore University 2014).
- Cossons, Neil, *The BP Book of Industrial Archaeology* (David & Charles, Newton Abbott, 1993).

- Daniels, Stephen, *Picturing Places, 'Transforming Topography'* (British Library) <https://www.bl.uk/picturing-places/articles/transforming-topography>.
- Daniels, Stephen, 'Mapping the metropolis in an age of reform: John Britton's London topography, 1820-1840' (*Journal of Historical Geography*, 2017), pp. 61-82.
- Daniels, Stephen, "'No Continuing City': John Constable, John Britton and Views of Urban History" (*Tate papers No. 33*, 2020).
- Darley, Peter, *Camden Goods Station* (Stroud, 2013).
- Dobraszczyk, Paul, *Iron, Ornament and Architecture in Victorian Britain: Myth and Modernity, Excess and Enchantment* (Ashgate 2014).
- Dow, Andrew, *The Railway: British Track since 1804* (Pen & Sward, Barnsley, 2013).
- Elton, Arthur, 'British Railways' (*Britain in Pictures*) (Collins. London 1945).
- Elton, Arthur, 'The Piranesi of the Age of Steam (John Cooke Bourne)', *Country Life Annual*, 1965, pp.38-40).
- Evans, Mark, *Constable's Skies: Paintings and Sketches by John Constable* (Victoria and Albert Museum, 2018).
- Filmer-Sankey, William, 'History of the Victorian Society' *The Victorian* (1958).
- Ford, John, *Rudolph Ackermann & the Regency World* (East Hoathly, Suseex, 2018).
- Fox, Celina, 'The engraver's battle for professional recognition in early nineteenth-century London' in *London Journal*, 2 (1976).
- Freeman, Michael, *Railways and the Victorian Imagination* (Yale, New Haven and London, 1999).
- Freeman, Michael, 'Tracks to a new world: railway excavation and the extension of geological knowledge in mid-nineteenth century Britain' (*British Journal for the History of Science*, 34 (1) 51-65 (2001)).
- [Gantee] Boulton & Watt Collection M/I/6/12, in three parts: See Margaret Sheila Gantee, 'James Watt Junior's Tour of the Forest of Dean and South Wales,' University of Wales M A dissertation 1993.
- Hadfield, Charles, *British Canals: An Illustrated History* (David & Charles Newton Abbott 1950).
- Hall, R M.S., 'Woodcraft's Heritage: The Collections at the Science Reference Library', *The British Library Journal Vol. 6, No. 1, SPRING 1980*, pp. 65-76.

- Hannavy, John, 'John Cooke Boume. Charles Blacker Vignoles and the Dneiper Suspension Bridge at Kyiv' (*History of Photography Volume 28, No 4*). pp. 334-47 (Winter 2004).
- Hill, David, *Turner and Leeds: Image of Industry* (Leeds, 2008).
- Hoggart, Richard, *The Uses of Literacy: Aspects of Working-Class Life* (Penguin 1957).
- Hoskins, W. G., *The Making of the English Landscape* (Hodder and Stoughton, 1955).
- Hudson, Kenneth, *Industrial Archaeology -- An introduction* (Baker 1966).
- Jackson, Peter, *George Scharf's London: Sketches and Watercolours of a Changing City, 1820-50* (London, 1987).
- Klingender, Francis D., *Art and the Industrial Revolution* (Noel Carrington, London 1947).
- Klingender, Francis D. (edited and revised by Arthur Elton), *Art and the Industrial Revolution* (Chatham: Evans, Adams & Mackay, 1968).
- [Knight, Andrew], *Art of the Engineer: Two hundred years in the development of drawings for the design of transport on land, sea, and air* (A Welsh Arts Council Touring Exhibition, 1978) published in 1981 (Ken Baynes and Francis Pugh) James Clarke (Cambridge).
- Lambert, Mark, *The designation and display of British railway heritage in the post-war decades*. PhD thesis, University of Nottingham (2017).
- Lee, Charles E., *The Evolution of Railways* (London 1943).
- Lewis, M. J. T., *Early Wooden Railways* (Routledge & Keegan Paul, 1970).
- Liffen, John, 'The Patent Office Museum and the beginnings of railway locomotive preservation', *Early Railways 2 papers from the second international early railway conference*. (M J T Lewis editor) (Newcomen Society 2003), pp. 202-220.
- McCarthy, Mark, A Georgian suburb: revealing place and person in London's Camden Town (Masters thesis, University of London 2018)
- Marshall, Nancy Rose. 'On William Powell Frith's Railway Station, April 1862', *BRANCH: Britain, Representation and Nineteenth-Century History*. Ed. Dino Franco Felluga. Extension of Romanticism and Victorianism on the Net. Web. [accessed 25.05.2021].

- Mitchell, B. R., 'The Coming of the Railway and United Kingdom Economic Growth' (*The Journal of Economic History*, Vol. 24, No. 3 (Sep. 1964), pp. 315-36.
- Mordant Crook, J., *The Greek Revival. Neo-Classical Attitudes in British Architecture 1760-1870* (John Murray, 1972).
- Myrone, Felicity, 'British topography: 'Our real national art form'?' (*British Library*, 2020).
- Nead, Linda, *Victorian Babylon* (New Haven and London, Yale University Press, 2005).
- Neavenson, Peter and Palmer, Maryllyn, *Industrial Archaeology: Principles and Practice* (Routledge, 1998).
- O'Byrne, Alison, 'Introduction: London Scenes,' *The London Journal* (Vol. 37 No. 3, November 2012).
- Oeynhausien, C. Von and Dechen, H. Von (translated by E. A. Forward and edited by Charles E. Lee and K. R. Gilbert) *Railways in England 1826 and 1827* (Newcomen Society and Published by W. Heffer & Sons Ltd. Cambridge 1971).
- Oliveira, Eduardo Romero, 'Photographic views of railroads: recording public works in nineteenth-century Brazil' (*Historia, Ciencias, Saucle-Mancluinhos*), volume 1.25 no.3 Rio de Janeiro July/Sept. 2018), p. 7.
- Opie, I and Opie, P, *The Singing Game* (Oxford: Oxford University Press, 1985).
- Ottley, George, *A Biography of British Railway History* (HMSO 1983). , (Ottley) *Supplement* (HMSO 1988).
- Ottley, George *A Biography of British Railway History, Supplement* (HMSO 1988).
- (Ottley) Graham Boyes, Matthew Searle and Donald Steggles, *Ottley's Biography of British Railway History Second Supplement 12957 – 19605* (York I1998).
- Petroski, Henry, 'Lives of the Engineers', *American Scientist*, Volume 92, 2004, pp. 410-414.
- Porter, Bernard, *The Battle of the Styles Society, Culture and the Design of a New Foreign Office, 1855-1861* (Bloomsbury London, 2011).
- Pragnell, Hubert John, *Early British Railway Tunnels. The implications for planners, landowners and passengers between 1830 and 1870* (Doctor of Philosophy, University of York Railway Studies (October 2016).

Rees, Gareth, *Early Railway Prints: British Railways from 1825 to 1850* (Phaidon, 1980).

Rix, Michael, 'Industrial Archaeology' (*The Amateur Historian*, Volume 2, No. 8, October-November 1955), pp. 225-229.

Michael Robbins, *The Railway Age* (Penguin, 1962).

Rolt, L. T. C., *Narrow Boat* (London Eyre & Spottiswoode, 1944).

Rolt, L. T. C., *The Making of a Railway - the building of the Great Central Railway* (Hugh Evelyn 1971).

Saby, Aurelien, 'W. H. Auden and the Poetics of Transport', *Etudes anglaises* 2016/4 (Volume 69).

Sangster, Matthew (*Journal of Victorian Culture*, Volume 22, Issue 3, 1 September 2017), pp. 317-328.

Sillitoe, Alan, *Saturday Night and Sunday Morning* (W. H. Allen London, 1958).

Skempton, A. W., 'Embankments and Cuttings on the early Railways' (*Construction History Vol. 11*. 1996), pp. 33-49.

Smiles, Sam, 'Picturing Places' (British Library). 'Turner's topographical watercolours'.

Smith, George Barnett, *Charles Fox* (Dictionary of National Biography, 1885-1900 Volume 20).

[Smith] *Old Euston an Account of the Beginning of the London & Birmingham Railway and the Building of Euston Station, by (G. Royde Smith)* (Country Life Ltd. for the London Midland and Scottish Railway), 1938.

Svedenstierna, Eric T., *Svendenstierna's Tour of Great Britain 1802-3*, ed. E. L. Dellow and M. W. Flinn (Newton Abbot 1973).

Taylor, Brian, 'Amateurs, Professionals and the Knowledge of Archaeology' (*The British Journal of Sociology*, Vol. 46, No. 3 (Sep. 1995), pp. 499-508.

Taylor, Roger, *Photographic Exhibitions in Britain 1839-1865* (National Gallery of Canada Ottawa 2002). <http://peib.dmu.ac.uk/index.php>.

Roger Taylor, *All the Mighty World: The Photographs of Roger Fenton, 1852-1860* (Yale, 2004).

- Thompson, E. P., *The Making of the English Working Class* (Victor Gollancz Ltd, London, 1963).
- Thompson, Matt, *The Picturesque Railway-The Lithographs of John Cooke Bourne* (History West Midlands 2015).
- Tindall, Gillian, *The Fields Beneath: The History of One London Village* (Eland Books, London 2011).
- Twyman, Michael, *Lithography, 1800-1850: The Techniques of Drawing on Stone in England and France and Their Application to Works of Typography* (Oxford University Press 1970).
- Twyman, Michael, *A Directory of London Lithographic Printers 1800-1850* (London 1976).
- Twyman, Michael 'The Tinted Lithograph' (*Journal of the Printing Historical Society*, No. 1 (1965)), pp.39 - 56.
- Twyman, Michael, 'Charles Hullmandel's stones at Kingston Lacy' (*Journal of the Printing Historical Society*, vol. 28, 2017), pp. 23-74.
- Weibenson, Dora, *Sources of Greek Revival Architecture* (A. Zwemmer Ltd., London. 1969).
- van Laun, John, 'John Cooke Bourne (1814-1896) lithographer: Drawings of the London & Birmingham Railway (1836-1838)' (*Journal of the Railway & Canal Historical Society*, Nos. 219 to 225).
- van Laun, John, *Early limestone railways of south-east Wales*, University of Hull PhD., 1999 (Published by Newcomen Society 2001).
- van Laun, John, et al, 'Hill Pits, Blaenavon,' (*Industrial Archaeology Review* 3 (1979)), pp. 258-75.
- Vanns, Michael A., *Witness to Change. A Record of the Industrial Revolution. The Elton Collection at the Ironbridge Gorge Museum* (Ian Allan. 2003).
- [Victorian Studies]. 'Review: Writing on Victorian Railways: An Essay in Nostalgia', *Victorian Studies Vol. 13, No. 1 (Sep. 1969)*, pp. 90-96.
- Vignoles, John, 'The construction of the Kiev Suspension Bridge 1846-1853' *Proceedings of the Institution of Civil Engineers - Engineering History and Heritage*, v. 165, n. 1 (February 2012).
- Vignoles, K. H., *Charles Blacker Vignoles. Romantic Engineer* (Cambridge University Press, 1982).

Wheeler, Mortimer, *Archaeology from the Earth*, (Oxford University 1954).

White, H. P., "Regional History of the Railways of Great Britain", Volume III Greater London (Phoenix London, 1963)

Wilkinson, Gerald, *Turner: Early Sketchbooks 1789-1802*, (London 1972).

