

REPRESENTATION OF THE ENGINEER: SHIFTING DEFINITIONS 1840-64

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ABSTRACT

Between the perfection of the Daguerreotype and the Talbotype processes in 1840 and the International Exhibition of 1862, engineers commissioned portraits in these new and more traditional mediums. These portraits and depictions of engineering represent the uncertain social position engineers occupied and the conflictual attitudes towards their work. To date, there remain relatively few portraits, despite the fact that a number of engineers became millionaires. That probably derives from the difficulty of depicting this new professional group within existing artistic conventions. Consequently some of the most striking visages of individual engineers are in the early versions of the photographic medium suggesting the engineer's implementation of technology and industrial method to impose a new reality, or radically changed industrial environment, on contemporary society.

Similarly, the few academic pictures of engineering works betray difficulties with the choice of appropriate pictorial typology and iconography. The majority of such representations derive from picturesque topographical traditions reflecting the preponderance of touristic promotional books aimed at the rising middle class, (the members of which supported such manifestations of technical and social progress). Popular admiration and anxiety about the physical changes effected through engineering were more directly represented in the new illustrated journals where iconographic innovation was feasible.

TABLE OF CONTENTS

ABSTRACT	ii
TABLE OF CONTENTS	iii
LIST OF ILLUSTRATIONS	v
INTRODUCTION	1
CHAPTER I THE MILITARY ENGINEER: HIS ROLE IN CIVIL ENGINEERING: Captain Fowke, R.E.	5
CHAPTER II A CONTEMPORARY 19th C. BIOGRAPHICAL ACCOUNT: Samuel Smiles	16
CHAPTER III THE CIVIL ENGINEER: PORTRAYED	
1 Sculpture. George Stephenson	21
2 Oils	
2.1 Robert Stephenson	31
2.2 I.K Brunel	40
3 Daguerreotype Robert Stephenson	46
4 Photography	
4.1 I.K. Brunel	54
4.2 John Fowler	60
5 Prints F.P.Smith	68

CHAPTER IV	THE CIVIL ENGINEER: HIS WORKS AND SOCIETY	
1	Lithographs by J.C.Bourne of the G.W.R.	75
1.1	BATH HAMPTON	77
1.2	BRISTOL #1 TUNNEL	81
1.3	WHARNECLIFFE VIADUCT	84
2	Photography:THE GREAT EASTERN	88
3	Oils	93
3.1	WORK	93
3.2	IRON AND COAL	101
3.3	RAIN, STEAM & SPEED: THE GREAT WESTERN RAILWAY	103
CHAPTER V	THE CIVIL ENGINEER: SOME NEGATIVE ASPECTS	
	Prints	
	Industrial Accidents	112
CHAPTER VI	CONCLUSION	122
	WORKS CONSULTED	124

LIST OF ILLUSTRATIONS

1. Major John Nicholson, 1851, Photograph
2. Lt. Gen. Sir James Outram, unknown artist, 1857, oils
3. General John Fox-Burgoyne by Thomas Heaphy, 1813, oils
4. International Exhibition Building of 1862, 1861, Lithograph
5. Captain Fowke, R.E., 1862, Lithograph
6. Charles Darwin, by George Richmond, 1840, Wash Drawing
7. Engineer Defends the Barwarie Railway Water Tower in India, 1858, Lithograph
8. George Stephenson by E.Baily, 1852, Statue
9. The Marquis of Dalhousie, K.T. by E.W.Wyon, 1853, Statue
10. George Stephenson. Statue located in Euston Railway Station, 1852.5.
11. George Stephenson, Statue located in Newcastle-on-Tyne, 1862.
12. Colonel William Gordon of Fyvie by Pompeo Batoni, 1766, oils.
13. Robert Stephenson by John Lucas cir. 1841, oils.
14. Dr. Richard Mead by Allan Ramsay, 1747, oils.
15. Hon. John A. MacDonald. 1858, Lithograph.
16. Isambard Kingdom Brunel, by John Callcott Horsley, 1857, oils.
17. The First of May by F.X.Winterhalter, 1851, oils.
18. Portrait of Middle-Class German Woman, 1850. Daguerreotype.
19. Robert Stephenson, by unknown photographer, , 1851. Daguerreotype.
20. The Duke of Wellington, by Antoine Claudet, 1844, Daguerreotype.

21. George Gilbert Scott: R.A., 1853, Lithograph.
22. I.K.Brunel Standing Before the Chains of the Great Eastern, by Robert Howlett, 1857, Albumen print.
23. Skipper and Mate, by Frank Meadow Sutcliffe, c. 1860, Photograph.
24. John Fowler: C.E., by John Jabez Mayall, 1865, Albumen print.
25. Rolling Mill Rolling Iron, 1855 Lithograph.
26. Samuel Egerton by Bartolommeo Nazzari, 1732, Oils.
27. The Great Britain, 1845, Photograph.
28. Francis Pettit Smith, 1856, Lithograph.
29. Four Middle-class Professional Contemporaries of F.P.Smith, 1853, Lithographs.
30. Prudhoe Castle by W.J.M.Turner, 1826, Water color,
31. Bath-Hampton by J.C.Bourne, 1846, Lithograph.
32. Bristol #1 Tunnel by J.C.Bourne, 1846, Lithograph.
33. Wharnecliffe Viaduct by J.C.Bourne, 1846, Lithograph.
34. Crossing the Brook by W.J.M.Turner, 1815, Oils.
35. The Great Eastern by Robert Howlett, 1857, Photograph.
36. Inauguration of the Waterworks, 1855, Lithograph.
37. Opening the Tavistock Railway, 1859, Lithograph.
38. Work by Ford Madox Brown, 1852-65, Oils.
39. The Mase Soup Kitchen, 1862, Lithograph.
40. English Summer Afternoon by F.M.Brown, 1853, Oils.
41. Iron and Coal by William Bell Scott, 1861, Mural.

42. The Forge by J.Wright of Derby, 1773, Oils.
43. Rain, Steam and Speed: The Great Western Railway by J.W.M.Turner, 1832, Oils.
44. Between Quilleboeuf and Villequier by J.M.W.Turner, 1832, Water color.
45. Gare St. Lazare by Claude Monet, 1871, Oils.
46. Charge of the Royal Scots Greys by Lady Elizabeth Butler, 1881, Oils.
47. Scene of Boiler Explosion Airdrie, 1860, Lithograph.
48. Page Bank Colliery on Fire, 1858, Lithograph.
49. Catastrophe at Bristol, 1855, Lithograph.
50. Britannia Tubular Bridge over the Menai Straits by S.Russel, 1849, Lithograph.

CHAPTER I

INTRODUCTION

During the period of 1840 to 1864, marked by the Great Exhibition of 1851, rapid technological and social changes brought engineers into considerable prominence. Their status in contemporary society was signified by the popularity of Samuel Smiles's multi-volume Lives of the Engineers (1857-1863). These decades marked a zenith in industrialization and technical development in the United Kingdom, when indeed those new forces were most developed in Britain. This period of unparalleled technological leadership also intersected with and supported a new phase in imperial expansion. The primary role of engineering in imperial policy is exemplified by the part the Royal Engineers played in establishing the colony of British Columbia in 1858, and in the large programs of construction undertaken for the exercise of British power in Africa, Asia and India. Thus engineers took on leadership roles within the social, cultural, economic and political domains by virtue of increased participation in the growth of British power. One aspect of their social position was their uniqueness as a new intermediary professional group that fitted uncertainly into the class structure of Britain. Ironically the traditional class distinctions were reinforced by the industrialization and commercial technology created by engineers. Yet if engineering inscribed the old social order, it also set in motion a complex process of social dislocation. Moreover, this period coincided with major changes in art practice, theory and criticism, and of the place of the artist in society.

With regard to art practice, the period witnessed the development of new processes and agencies for the dissemination of visual material. While appearing to be collectively

associated with Britain's socio-economic growth, the engineering profession did not readily fit into conventional class structure, being drawn from diverse groups such as architects, artisans, mechanics, surveyors and the military. The Institution of Engineers incorporated in 1828, became a professional decision-making body some years before architects established their own association, as the Institution of British Architects in 1835. Significantly the engineers did not seek royal patronage as acquired by the architects in 1837, although they would ultimately form a separate Institution of Mechanical Engineers in 1859. Their charters inform us of how they saw themselves legally. However, their clients and the wider public could see them and their modernizing influence, not only through their works, but also through other novel means. Their self was projected for the public 'gaze' by portraits and commemorative sculpture in city halls and other public spaces. Of course engineering works were also illustrated in academic and narrative painting as well as popular illustrated journals notably in such magazines as Illustrated London News and Punch.

This study focuses on the analysis of visual representations of the engineer and engineering, in relation to wider socio-politico-economic and cultural contexts. Changes in the physical landscape following large engineering enterprises were represented by so called "High Art" exponents such as J.M.W. Turner, William Bell Scott and Ford Madox Brown. Academic and narrative depictions of engineering and mechanization obviously contributed to contemporary debates on industrialization and Victorian ideas of progress, but these discourses were also manipulated by commercial interests using artistic mediums. The Great Western Railway for instance, subsidized the production and publication of topographical views drawn by J.C. Bourne, of their line from London to Bristol and emergent popular illustrations such as

early photography, as well as engravings or lithographs showing the opening of bridges, canals, roads or railways provide diverse commentary on modernization and its discontents.

Based on research and analysis of a representative selection of illustrations, I argue that mid-19th Century quasi-scientific developments in visual representation best depict the emergence of the engineer as a distinct entity within the social framework of Britain. Consequently this study will combine the contextualization of art production proposed in the post-modern critique with close study of iconography so as to identify evidence of revisions in established artistic conventions, for the accommodation of new engineering subject material. The resulting critical questions or issues can be summarized as follows:

Who were the engineers and from whence did they emerge? What kind of education and training did they receive? Who did they work for and for what kind of work were they recognized? What is the socio-economic reality behind the portrayal of the engineer as the agent of change leading to the improvement of society in mid-Victorian Britain? Through what kinds of visual imagery were they represented? What was their role in the change that led to the growth of Britain as such a great industrial and imperial power? Most importantly how was the engineer portrayed and his impact on contemporary social, political and institutional organizations constructed?

By mid-century some of the more memorable figures of the earlier phase of the industrial epoch, such as Sir Marc Brunel and James Nasmyth had passed away and had become legends. Still, the most successful industrial and railway engineer, Robert Stephenson continued to improve steam engine performance and bridge design. A whole host of others were perfecting such new apparatus spanning the public and domestic spheres as steam

ploughs, flush toilets, sewage disposal and provisions for clean drinking water.

While testimonials (organized public meetings) to Stephenson invariably brought crowds to hear about his exploits, I.K. Brunel was busy on advanced railway schemes from screw propellers to iron ship construction. Meanwhile F.P. Smith was replacing paddle wheels with the screw propeller and General J. Burgoyne R.E. was building railways in a war zone for military logistical support a full decade before the Union Corps of Engineers copied the idea in the U.S. Civil War.

This thesis will examine the representation of engineers and engineering against their production so as to gain insight into their constructions of an identity against wider public response and that of artists and illustrators.

CHAPTER II

THE MILITARY ENGINEER: HIS ROLE

CAPTAIN FOWKES, R.E.

Organized within the British Army in 1757 as a uniquely separate regiment of officers, the Royal Engineers enjoyed a reputation for versatility and effective logistical support for the fighting arm of the military.¹ Engineer officers were among the few in the army who did not have to purchase their commissions and while respected as a technical elite, they never attained the prestige of officers even in less celebrated infantry regiments. Nearly all of the representations of military personnel prior to the Crimean War were of officers, posing individually in a conventional manner and generally capless. My investigation has unearthed some images of serving officers posing in civilian clothing in contrast to those more frequently seen in medal adorned uniforms and carrying swords.² (Figs. 1&2)

Pictures of individual Royal Engineers are rare, the National Portrait Gallery in London has an early unfinished oil painting of John Fox Burgoyne R.E. which is an exception although there are some indeterminate pictures of engineers amongst fighting soldiers.³ (Fig. 3) It is important to note that these portraits are photographs taken around the period of the Crimean War (1854-1856) and the Indian Mutiny (1857-1859) in that they depict engineers in

¹ In 1908 there were only 179 members of the Royal Engineers. Barthorpe, M. The Armies of Britain 1485, 1980, page 175 also Haythsonethwaite, P. Weapons and Equipment of the Napoleonic Wars, 1979, p.92. Also, Weiler, J. Army Architects: The Royal Engineers and the Development of Building Technology in the 19th Century, U. Of York (U.K.) Ph.D. 1987

² Ibid. pp 160-4 and Portraits in the National Army Museum, London.

³ Featherstone, D. Weapons and Equipment of the Victorian Soldier, 1978, p.7; Fig. 7

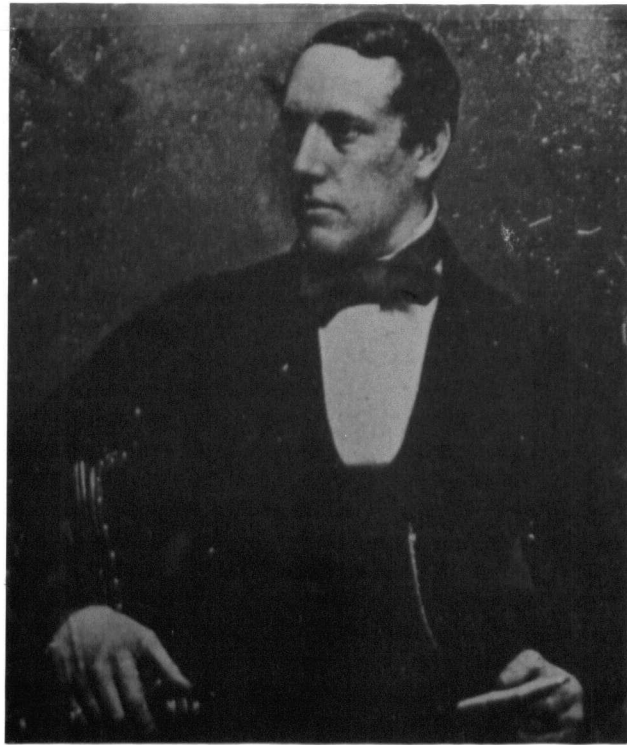


Figure 1. MAJOR JOHN NICHOLSON, 1851, photograph 6511-115, from The Armies of Britain, 1485-1960, The National Army Museum, London, p. 164.
Original in The National Army Museum, London

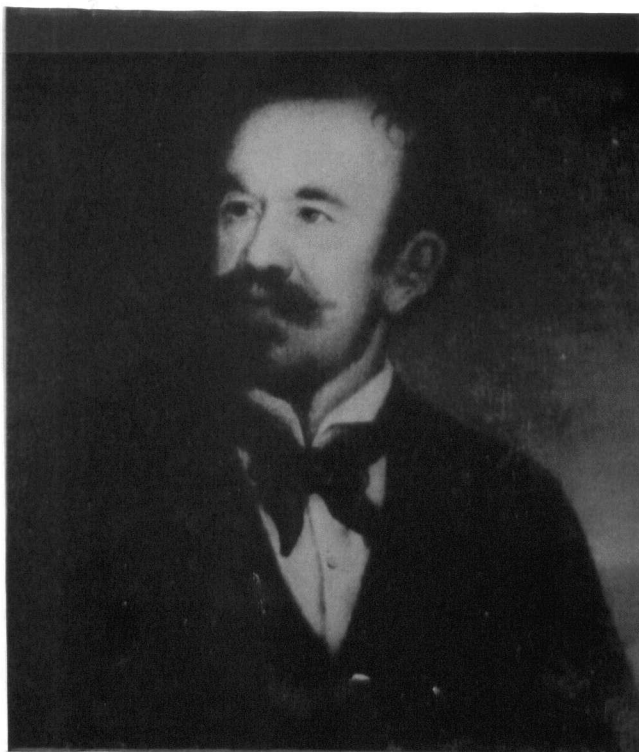


Figure 2. LT. GEN. SIR JAMES OUTRAM, 1857, Portrait oil on canvas, artist unknown, 6308-42, from The Armies of Britain, 1485-1980, The National Army Museum, London, Original in The National Army Museum, London



Figure 3. Thomas Heaphy. SIR JOHN FOX BURGOYNE, B.T., 1813. Oil on canvas.
Original: National Portrait Gallery, London, Reg. No. 1914(5)

combination of their traditional role with their new role of building railways.⁴ The 1854 reorganization of the army, which among other measures included the elimination of purchased commissions for the rest of the officer corps, provided engineer officers with enhanced status. Previous to 1854 by purchasing commissions, army officers were automatically considered as members of the moneyed class which by default now included the engineer officers.

By 1858 the Royal Engineers in their surveying capacity, were replacing topographical pencil sketches and water colours with photographs. This prompted the government to follow an example set by Colonel James R.E., the Director of Ordnance and appoint photographers to military and colonial services. Photographs thus became an official method of documenting topography and involved a direct transfer from military to civilian practice.⁵ As such it provided evidence of continued British imperialism at work.

Introduction of the new photographic technology pioneered by Fox Talbot, coincided with a major change in government policy. This was the secondment of military engineers into the civil sector with a consequent change in the social stature of these engineers.⁶ The enhanced status brought to civil engineering by the influx of Engineer officers is exemplified by their potential to attain high military, if not social rank. One officer was Captain Fowke later selected to design the 1862 Great International Exhibition Building (Fig. 4). His likeness from a photograph by John Charles Watkins was published in the Illustrated London News,

⁴ Illustrated London News. March 10, 1855, pp. 224-5

⁵ I.L.N. May 3, 1862, pp. 431-3, and Kemp, A. Weapons and Equipment of the Marlborough Wars. 1980, p.103. In times of peace engineer officers were often employed in public works, i.e. General Wade built the Scottish Highlands road network.

⁶ Barthorpe, M. 1980. p 165.

(I.L.N.) The publication of his photograph made him an immediate public figure (Fig.5).

Plainly Fowke wears civilian clothes and is seated on a chair in a similar pose favoured by another famous commoner Charles Darwin, in his portrait painted by George Richmond in 1839.(Fig.6.) Apart from the caption, the only indication that Fowke served as a military engineer is the iron ring of the Brotherhood of Engineers which he so prominently displays on the small finger of his left hand.⁷

In 1860 when Captain Fowke was preparing his plans for the International Exhibition, fellow engineer officer John Fox Burgoyne had been promoted Lieutenant General. Burgoyne had also been gazetted in the Queen's Honors List, Grand Commander of the Bath partly in recognition of building the first suspension bridge and a railway in the Crimea, (1854-1856).⁸

Further prestige attached to engineers from awards of the Victoria Cross, the highest award obtainable in the British Empire for bravery in the field, notably the investiture of Royal Engineer Lieutenants, G. Graham and J. Ross.⁹ Nor should it be forgotten that engineers saw service in not only the Crimean War, but also the Indian Mutiny (1857-59), campaigns that greatly augmented public recognition of the military and engineering in terms of imperial and

⁷ I am indebted to David A. Rush, P. Eng., and C. Edward Rush, P. Eng., for this information.

⁸ Encyclopedia Britannica, Fourteenth Edition, p. 405. Burgoyne was the illegitimate son of Sir John Burgoyne. I.L.N. 1855 #1 of 2. Vol. 26, P.450. Burgoyne's railway moved 246,000 lbs. Of domestic consumables (corn, biscuits, salt meat...) to the front line troops every day.

⁹ I.L.N. March 7, 1857, p. 202.

hence economic expansion¹⁰ (Fig. 7).

A further aspect of railway engineer's work was investigative¹¹ For example, Captain Wynne R.E. was appointed investigating engineer to the July 1857 accident concerning a train collision where eleven people were killed. It is significant that the Board of Trade chose their representative not from a railway company but from the military, his title and assumed non-partisanship probably being key factors in his selection. The military did not have a sole monopoly on engineers as however shown by the invention of the iron chain cable by Captain Sir Samuel Brown R.N., lauded in the Reports of the Juries of the Great Exhibition of 1851.¹² Aspect of popular attitudes toward the engineer will be examined in the following chapters.

¹⁰ I.L.N., May 23, 1857, p. 509 and July 18, 1857, p. 49 also Jan. 2, 1858, p.5, Mr. P.O. Snow railway engineer, successfully defended Barwarie water tank for 32 hours against mutineers. Featherstone, D. Weapons and Equipment of the Victorian Soldier, 1978, p. 5 Lists of British Army Campaigns.

¹¹ I.L.N. July 4, 1857, p.10.

¹² I.L.N. January 6, 1855, p.9

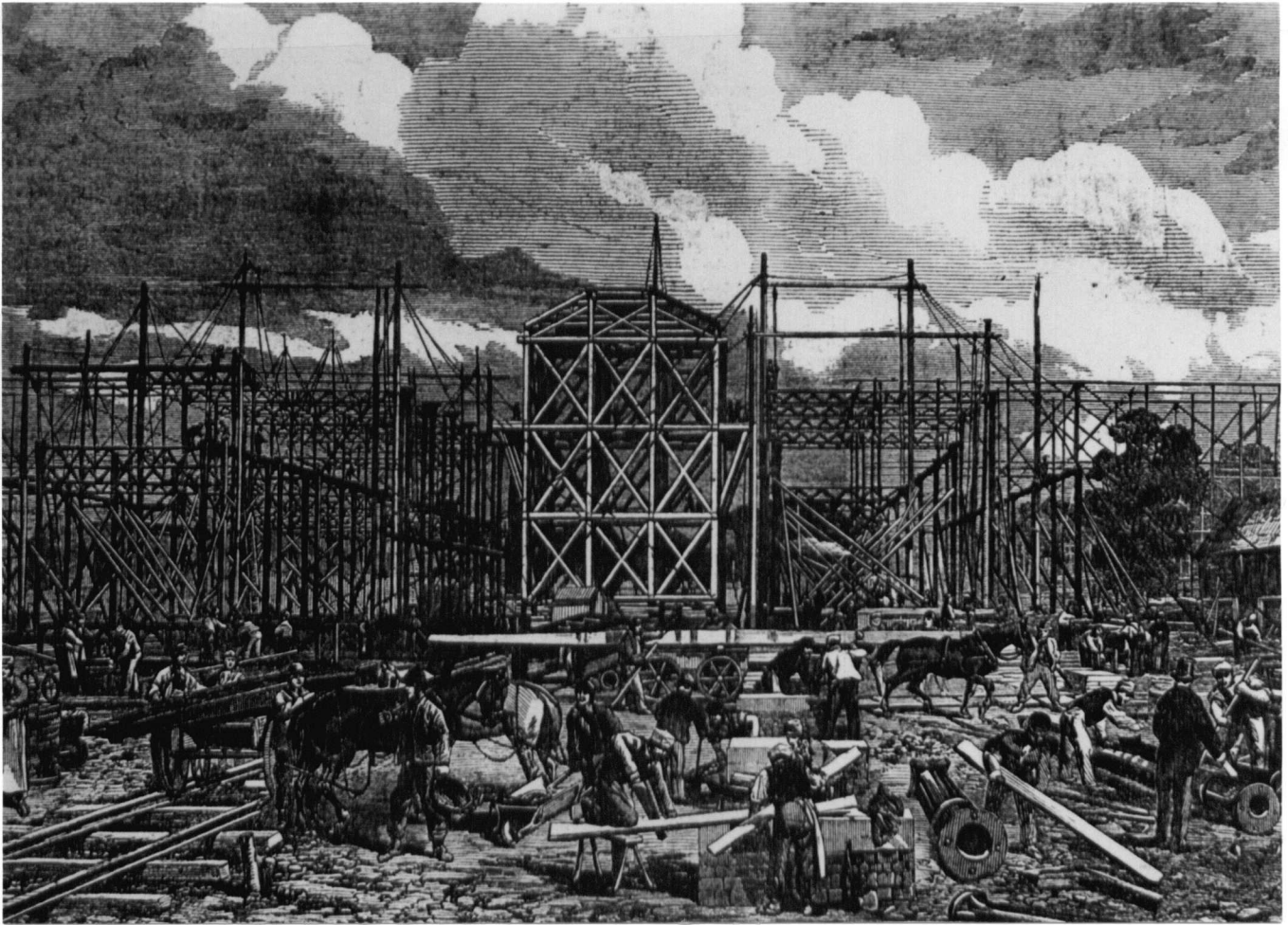


Figure 4. BUILDING FOR INTERNATIONAL EXHIBITION OF 1862.
Lithograph, I.L.N. July 27, 1861, p. 102

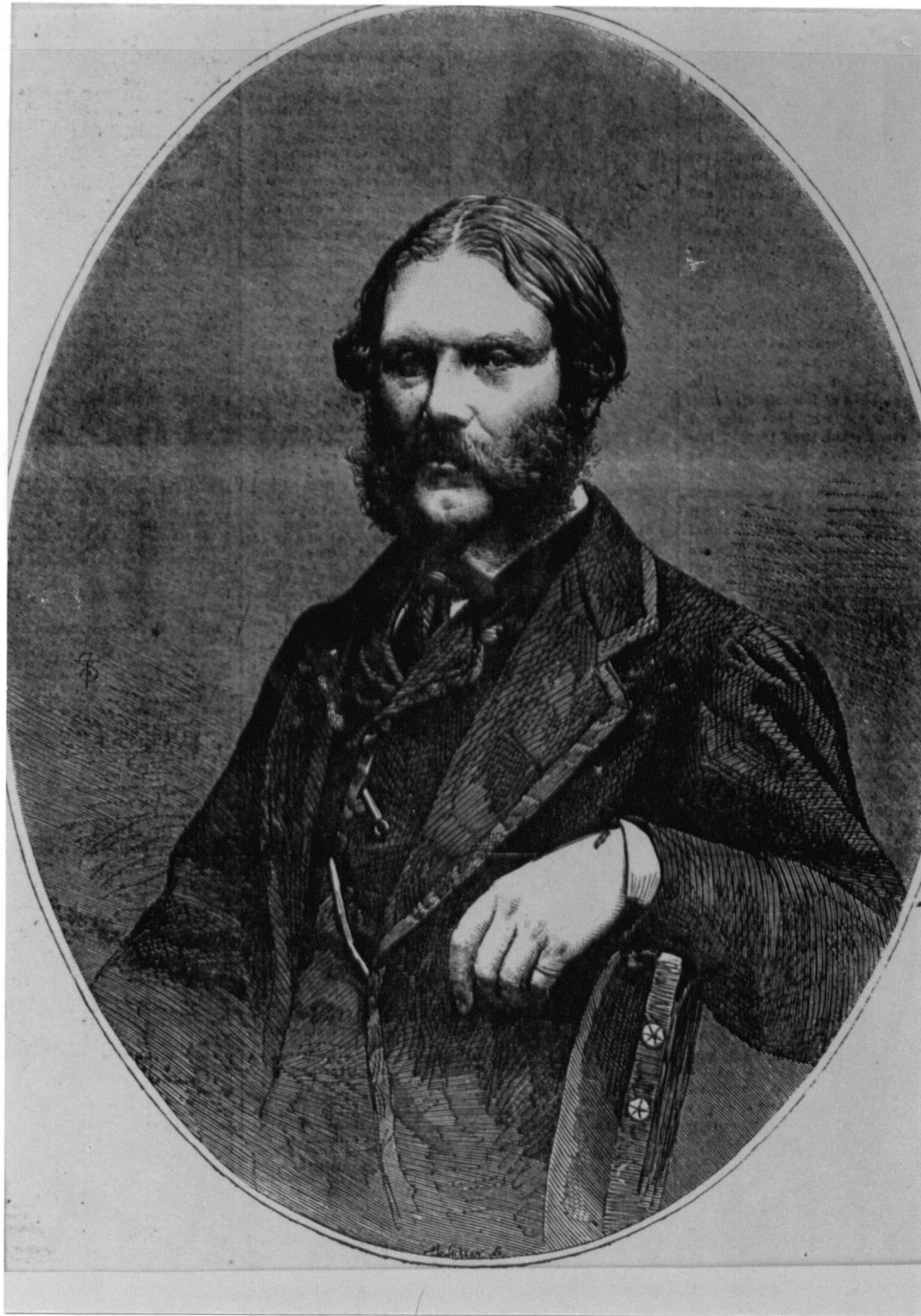


Figure 5. CAPTAIN FOWKE, R.E., DESIGNER OF THE GREAT EXHIBITION BUILDING.
Lithograph from a photograph by John and Charles Watkins, I.L.N. May 3, 1862, p. 431



Figure 6 George Richmond, CHARLES DARWIN AT THIRTY, watercolor. 1839.
Horizon, Autumn 1966, Vol. 8, No.4, p.40
Original unknown.

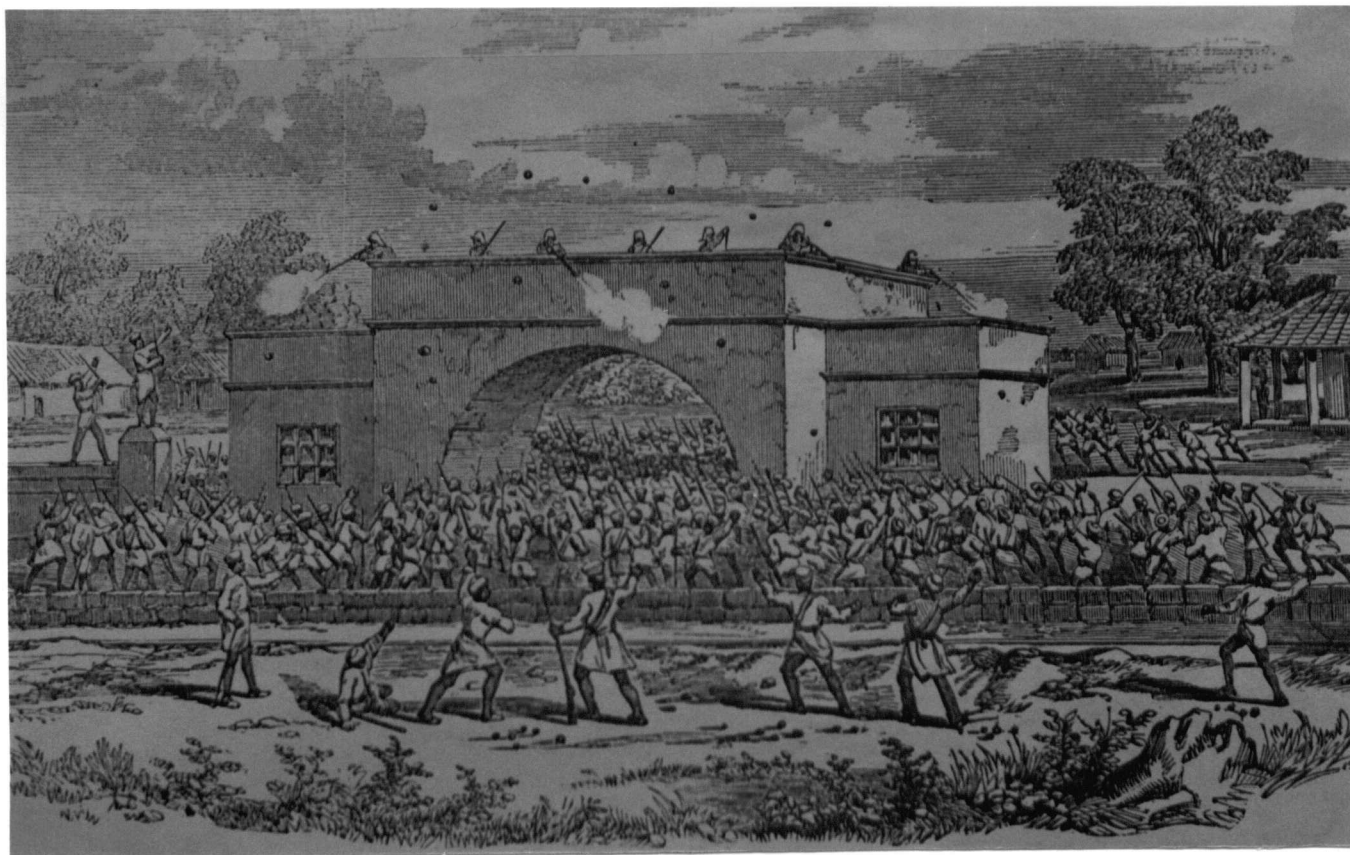


Figure 7. ENGINEER DEFENDS THE BARWARIE RAILWAY WATER TOWER IN INDIA
I.L.N. January 2, 1858, p.5

CHAPTER III

19th Century

CONTEMPORARY LITERATURE - BIOGRAPHICAL ACCOUNT

SAMUEL SMILES

The popular publications of Samuel Smiles form a basis for understanding public and more properly, middle class attitudes towards engineers because he knew several engineers personally and held a senior position in a railway company. He valued engineers as members of a new non-privileged group who deserved recognition for advancing the workings of contemporary society and in particular for creating new employment and wealth, however negative some of the side effects may have been, notably urbanization and pollution. These factors and his celebrated books Lives of the Engineers (1857) and Industrial Biography (1861) inform us that “They have advanced themselves in the course of a few years, from the station of small farmers to that of great capitalists owning estates in many counties, holding the highest character as commercial men, ranking amongst the largest employers of labor in the kingdom”.¹³ This was a very eloquent statement of mid-nineteenth century ontology of progress and no doubt received great acclamation by engineers. Nevertheless it deserves careful scrutiny.

¹³ Smiles, S. Industrial Biography, 1861, p161

Analysis of the family background of early 19th Century engineers show that 25 percent (25%) were sons of farmers who rose rapidly from this social station to substantial wealth and higher social stature.¹⁴ Several eschewed the purchase of estates, (the usual practice of successful merchants or professionals to assert their new social status) and thus declined land leasing which social geographer David Harvey has called "Fictional capital".¹⁵ However, the fact that a greater number including I.K. Brunel, bought country estates underscores the ultimately conservative operations of the new capitalist and commercial wealth yielded by the industrial and imperial expansion.

Samuel Smiles only addressed readership that was generally involved in this process and hence in agreement with his ideology and values. He sought to normalize, or more precisely to demonstrate, the negative aspect of industrial and technological development and engineering, writing "The living race is the inheritor of the industry and skill of all past time; and the civilization which we enjoy is but the sum of the useful efforts of labor during the past centuries."¹⁶ There could be no stronger support for industrialization than Smiles's definition of civilization, even if he ignored the dirt, squalor, unemployment, exploitation, noise, despoilization and other socially destabilizing factors it involved. Who are the 'we' and how do 'we' enjoy the civilization to which Smiles refers? Perhaps one answer lies in Smiles's own life.¹⁷ After qualifying in medicine at Edinburgh University he went into journalism and

¹⁴ Author's 1997 study of 85 British engineers active in the first half of the 19th Century

¹⁵ Harvey, D. Conscientiousness and the Urban Experience. 1985, p.13.

¹⁶ Smiles, S. Industrial Biography 1861, p.167

¹⁷ Samuel Smiles was my wife's great-great uncle and her family is very pro-Smiles.

became editor of the Leeds Times. Both the job and the position were prestigious and gave him a position of status in the new Victorian 'civilization'. Later Smiles became the Secretary of the Leeds and Thirsk Railway, a post that had a considerable power base where he would be in touch with Members of Parliament, shareholders and landowners, people of standing regarding railway profitability. Being secretary elevated him above the labor he mentions and placed him in contact with other intermediary professionals, including the engineer Robert Stephenson. Not surprisingly, one can detect a bias in his writings about the effects of railways and engineers that fashioned his view of 'civilization' which was one of an academically trained man who was investigative in his journalistic field and economically aware in his role as guardian of shareholders' money. Nevertheless he was quite selective in his choice of engineers as subjects, ignoring those who did not become famous, receive honors or testimonials, a veritable Foucaultian void.¹⁸

Another aspect of Smiles's selective biography is the failure to address conflict within the new engineering profession. One highly contentious question concerned the standardization of railway gauge or width between rails. Brunel promoted the broad gauge of 7.0 feet, as both a technical improvement, (49% higher loading capacity and higher speeds), but also as a competitive commercial ploy over Stephenson's standard 4.7 feet gauge.¹⁹

Their rivalry reflected more than technical difference in that it very probably included ethical and political thought. Moreover, their professional clash was eventually settled in favor

¹⁸ Foucault, M. The Archaeology of Knowledge, N.Y.: Harper & Row, 1972, p.25.

¹⁹ Brunel's 7' 0", G.W.R. gauge was a significant improvement in terms of economy, functionality, speed, comfort over Stephenson's narrower 4' 8 ½" gauge which derived from Flanders built artillery carriages. Muller, J. A Treatise of Artillery 1780., p.109

of non-progressive successful considerations contradictory to Smiles's position. Technically with the advantage of a broad wheelbase, fireboxes and carriages, Brunel's design held the advantage. Economically the G.W.R. locomotives were great cost-savers but the existing standard gauge bridges and adjacent systems would have required extensive reconstruction to convert, so Stephenson's narrower gauge prevailed. On this subject the government was though to be ambivalent, but in fact favored a single gauge as protection of the collateral of the larger number of vested interests.²⁰ In that respect Smiles himself probably supported conservative attitudes since he wrote more extensively about the two Stephensons in his books than the Brunels.

Other details from Smiles's biographies are equally telling. For example they included the unfortunately erroneous claim concerning the raising of Henry VIII's ship the MARY ROSE in 1836 by engineer John Dean indicating a credibility deviation.²¹ In fact it was only raised in 1982 by the Mary Rose Trust.²² If Smiles elaborated on one incorrect assumption, it attracts questions to his other journalistic comments.

The valorization of the engineer as purveyor of reason, diligence and entrepreneurship is further sustained by lengthy discussion of other actors in the narrative of engineering from workers, aristocratic landowners, government bureaucrats and politicians. At no time is Smiles

²⁰ LLN, August 28, 1852, p.170. Review of Our Iron Rails by Williams, F.W. who criticizes the government for its involvement.

²¹ Smiles, S. Men of Invention and Industry, 1884, pp.9-10

²² Treasures for the Nation, 1988, p.56. Details of the raising of the ship. Also Bass, G. "History Beneath the Sea: the Birth of Nautical Archeology" in Archeology, Nov./Dec. 1998, p.50.

advocating social or political critique, let alone questioning the expanding middle class society which included engineers among the professional class and to which they contributed considerably to its evolution. Still, his viewpoint was not untypical in that the last thing he probably wished for was a change in the status quo.

Here reference to Hilary Smith's study of the impact economic and related political power factions on socio-political discourse is highly relevant.²³ "The dominant culture" as Smith notes, "defines the terms, perpetuates the myths, forges the stereotypes to its own benefit and colors it with moral judgements." With this in mind we may well ask if there is more than a coincidence in the title of Smiles's book The Lives of the Engineers and Vasari's book Lives of the Artists²⁴ It is no secret that Vasari in his work, embellished the lives of artists with whom he had empathy and could overlay certain favorable narratives within his own jurisdiction. Nonetheless the public esteem Smiles achieved earned him inclusion within the central figures in Ford Madox Brown's painting Work which places him in a parallel sphere but later time frame to Vasari as a purveyor of his own fame by elevating the fame of others.²⁵

²³ Smith, H. "Commentary: How I raised my consciousness by raising funds at Harvard and the U.S.A." in World Vol. XI: No. 2, March 1997, p.10

²⁴ The Story of the Life of George Stephenson, 1869 and Lives of British Engineers by Smiles, also Lives of the Artists by Vasari, G. Vols. 1 and 2, Penguin Classics. See also Barthes, R. Death of the Author, 1977, p.142 'where she speaks for herself.'

²⁵ Woodward, Sir L. The Age of Reform 1815-1870, 1962, p.596. The other two central figures are Carlyle and the Rev. Maurice from Ironside, R. "Pre-Raphaelite Paintings" in Architectural Review, Dec. 1942, p.157.

CHAPTER IV

THE CIVIL ENGINEER: PORTRAYED

1. SCULPTURE

GEORGE STEPHENSON

The Englishman's partiality to sculpture in the 18th Century especially in the antique trade was, according to Brian Allen "...a factor which meant much to Englishmen who liked to think of themselves as reincarnated Romans."²⁶

Sculpture's popularity in the 19th Century, was no doubt influenced by the British victories over Napoleon which were commemorated in English cities by statues of military heroes and as the military had no monopoly on sculpture it follows that famous engineers notably George Stephenson would be immortalized in a like manner.

After the opening of the Great Exhibition in 1851, a ten feet high statue in Carrara marble commemorating George Stephenson, sculptured by E.H. Bailey R.A. was installed on a plinth in Euston Station (Fig. 8). Holding plans of an aqueduct, this statue of the elder Stephenson in contemporary dress conveyed to the public his stature as one of the country's greatest engineers. Not only had he contributed significantly to the application of steam power, but also as progenitor of an international standard for railway construction.²⁷

²⁶ Allen, B. Francis Hayman, 1987 Chapter 3, p.35 where he discusses the Englishman's attitude towards sculpture.

²⁷ Smiles, S. Life of George Stephenson, 1869, p.207



Figure 8. THE LATE GEORGE STEPHENSON by E. Bailey.
I.L.N. December 18, 1852, p.552

Railway company shareholders showed by the erection of the large public statue so like in composition to the smaller one designed by W. Wyon commemorating the Marquis of Dalhousie,²⁸ an elevated sense of the social recognition of engineers (Fig. 9).

Placement of the statue in the Director's meeting room of the London & Northwest Railway's Head Office thus restricting access to only their select company, confirms David Harvey's observation that "...space and time are forms of social power..."²⁹ By the exclusion of the lower classes from the 'gaze' it automatically assumed an inclusion into a higher social class of the engineer as a participating agent in industrialization (Fig. 10).

Less than a decade later a bronze statue of Stephenson was erected in their city center by the Newcastle townsfolk (Fig. 11). Standing in a Praxitelian pose and attired in modern costume, George Stephenson was presented in a different role to the engineer at Euston Station. Holding a pair of calipers in his right hand and a scroll in his left, he is surrounded by four figures representing features of his preferred past activities. Pitman, platelayer, blacksmith and engine driver recline at his feet providing testimony to his establishment of new types of employment and expertise as well as his elevation beyond their artifice state. Thus this statue manifests an aura of 'local boy makes good', a further signifier of success in the larger-than-life scale serving as an allegory of his fame. The choice of modern costume, with the addition of a Northumbrian plaid over his left shoulder, combined with classical posture reinterprets conventional practice to convey him as a modernizer of Britain.

²⁸ LLN, Jan. 2, 1853, p.61. Lord Dalhousie was Governor-General of India from 1848 and a committed railway enthusiast from the view of railways for imperial control and military strategy.

²⁹ Harvey, D. Consciousness and Urban Experience, 1985, p.32

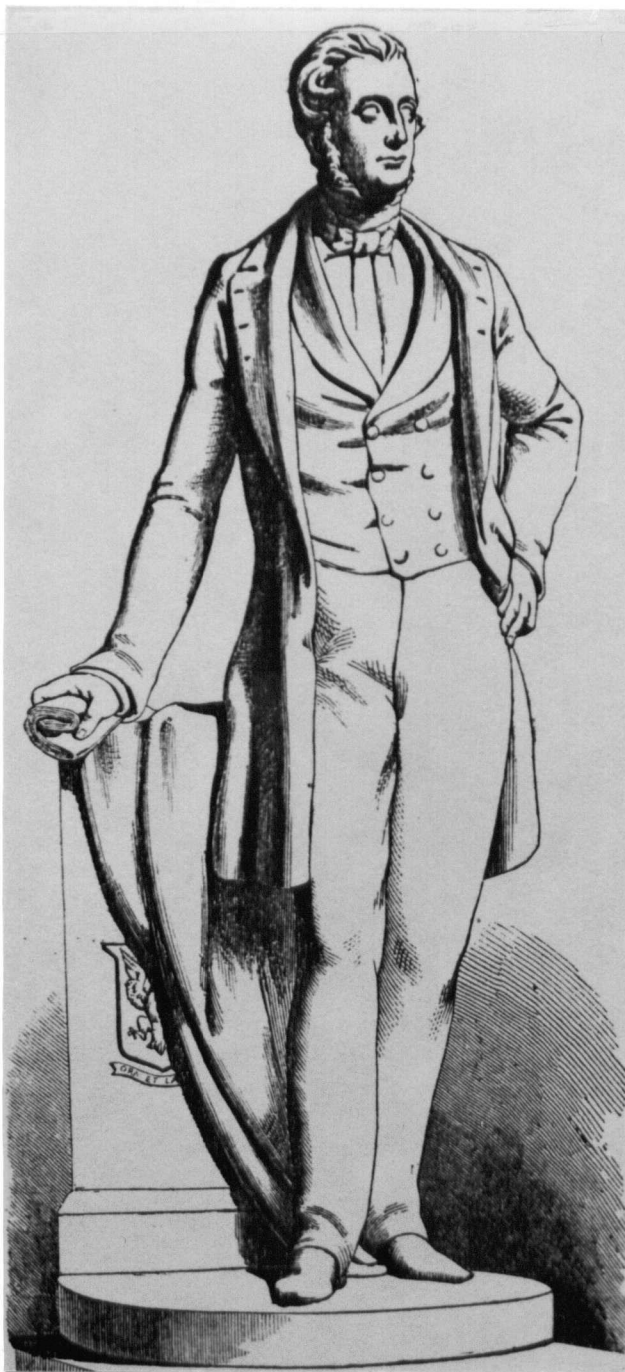


Figure 9. THE MARQUIS OF DALHOUSIE K.T. by E.W. Wyon.
I.L.N. January 2, 1853, p.61

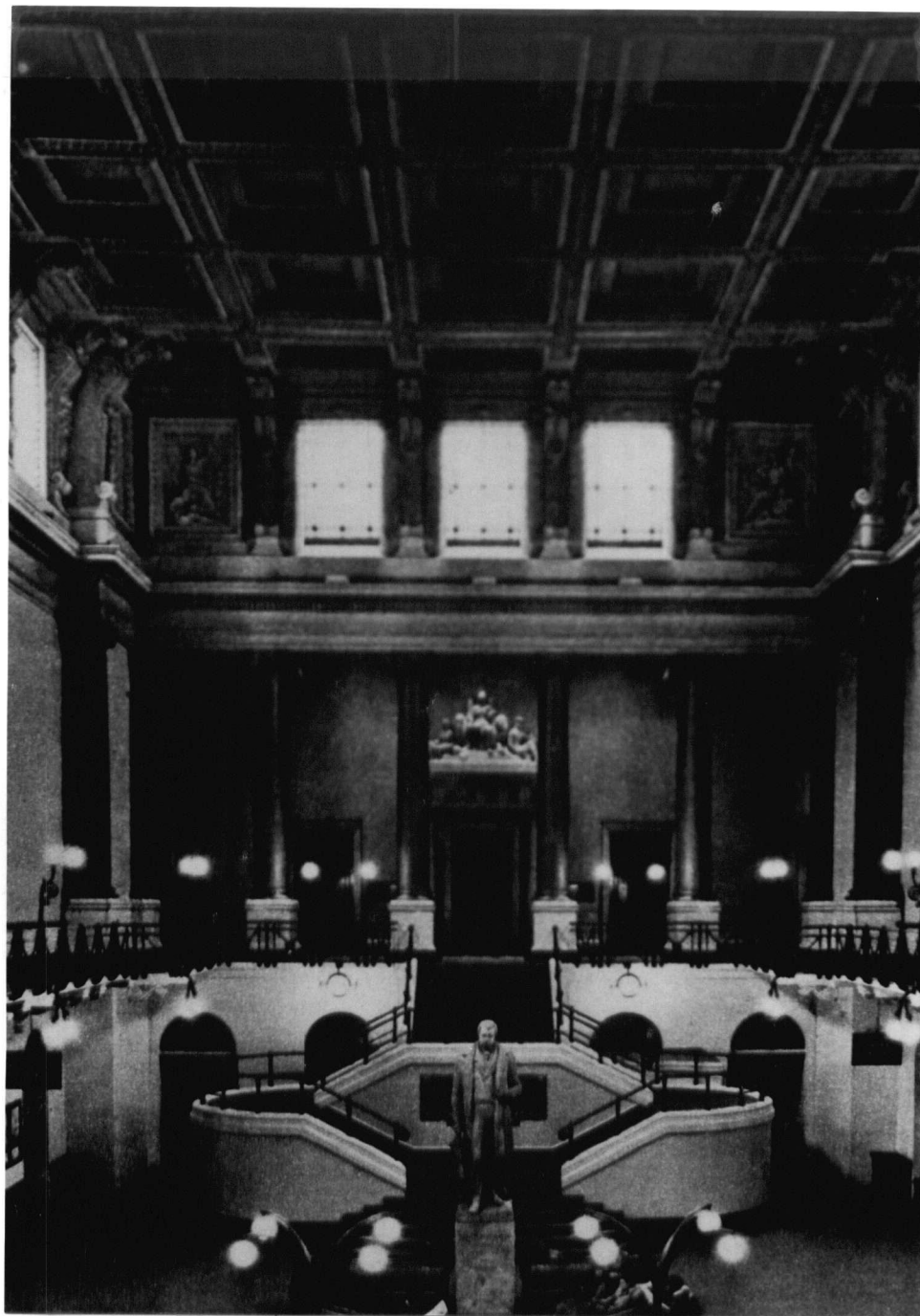


Figure 10. Statue of GEORGE STEPHENSON, in the Great Hall of Euston Railway Station, from Hamilton Ellis, *Railways*, Hamlyn, 1976, p.184. Original was in Euston Station until it was modernized in the 1960's, location currently unknown.



Figure 11. GEORGE STEPHENSON MONUMENT, NEWCASTLE-ON-TYNE.
I.L.N. November 1, 1862, p.456

While clearly an ennobling representation, the idealization is tempered by his local costume which underscores a new vision of masculinity, politicized through engineering work. In fact the localized plaid also served to indicate Stephenson's higher status than the manual agents of industrialization such as pit worker or engine driver. Another example of the use of the plaid as a means of showing the elevated aristocratic and social standing of a commoner is the 1766 painting by Pompeo Batoni of Colonel William Gordon of Fyvie, the second surviving son of William 2nd., Earl of Aberdeen and Anne, daughter of Alexander, 2nd., Duke of Gordon.³⁰(Fig. 12). The Colonel's likeness was produced for a very restricted 'gaze' that would have been mostly aristocratic, whereas the Stephenson statue was erected primarily for public acclamation constantly adding to his fame and achievements.

Turning momentarily to Smiles's reference to engineers advancing themselves from sons of farmers, it stands to reason that they would have had less opportunity for a formal schooling than those from paternal backgrounds of doctors, druggists, lawyers or pastors, for no other reason than not lack of opportunity but lack of parental guidance. Equally, engineer sons of farmers would have been faced with a similar situation which would account for some who entered the profession by virtue of their intellectual skills rather than their academic skills to follow a different path within the engineering profession. Whichever branch of engineering

³⁰ The Treasure Houses of Britain, 1985, p.257, Fig. 176. William Gordon as a younger son of an Earl and having no title was classed as a 'commoner'. However his noble birth gave him the right to be addressed as "Honorable", (see Whitaker's Peerage 1937), and precede the eldest son of a Baron, or Knight of the Garter (if a commoner) and many others. By W. Wyon using the plaid on a statue he identified with Gordon as promoting a commoner as 'noble'. Ibid, p.536, Fig.473 Allan Ramsay, William, 18th Earl of Sutherland, 1763. This plaid clad figure reinforces George Stephenson's posing as an aristocrat. Ramsay, by association elevates W. Wyon's figure from the illiterate to the aristocratic.

they chose to follow, they were distinct and socio-economically important. Paradoxically perhaps a latent bearer of meaning in Stephenson's dress is the absence of overt professional signification. There is another dimension to Stephenson's elevated position. George Stephenson relied on Thomas Gooch to articulate his technical ideas in print and engineering drawings and Gooch's biographer Michael Robbins informs us (from Gooch's notes), that Gooch learned mathematics and drawing at school after which he was appointed secretary by George Stephenson to handle all correspondence and produce "...finished drawings from verbal instructions," setting the pattern of theoretical knowledge and practical engineering working alongside of each other³¹. A significant factor is that Thomas Gooch later became assistant engineer to Robert Stephenson. This dual engineering origin arrangement illuminates the place of the engineer in the socio-economic structure. Samuel Florman writing on "Engineering and the concept of the Elite" observes that British engineers well into the 20th Century, lacked the systematic training of engineers developed in France and Prussia by the period of this study.³² This observation highlights one the fact that even today there is often confusion in people's minds when terminology conflicts with functionality i.e. Is an engine driver ipso facto a railroad engineer?³³ Returning to the Stephenson statue in Newcastle, it is little wonder that the four supporters at Stephenson's feet represent trades rather than professions, because the subsidiary figures are seated but subservient to the engineer, their identification being self

³¹ Robbins, M. Thomas Longridge Gooch 1808-1882 In the Newcomen Society, Vol. 56, 1984-5, p.59. There is no extant image of Gooch.

³² Florman, S. The Introspective Engineer, 1996, p.168

³³ Ibid, p.183, This outlines how terminology regarding engineers is more subjective than that concerning doctors or lawyers.

explanatory. A blacksmith rests on an anvil, pitman carries a miners lamp, platelayer holds a piece of rail and engine driver leans on a model locomotive so that all four lower figures related in their iconography to George Stephenson. The rail is a 'fish-bellied' type from which the early tracks were laid; the lamp is a 'Geordie' type and not a Davy lamp and the model refers directly to the Rocket or Locomotion being at the forefront of locomotive design.³⁴

The composition and imagery of the two statues of George Stephenson correspond with the estimate related by Lord Ravensworth during a testimonial:³⁵ "Emmerson has written essays but in his pages the name of George Stephenson has no place. Carlyle has discourse of the hero in every form, but of the hero of the self-made man, the worker, inventor, the creator of a new motive power, and directly a new age, he too is silent". It can be inferred that if great literary men failed to point out the deeds of engineers, then the greatness of their deeds would take on a much lower position in men's minds. On another level, military and naval deeds were almost always recognized by State honors and publicity because any particular practitioner was by virtue of an entitled position in those organizations, a member of a privileged class, whereas at this time, the engineer was one of 'the other'.³⁶

³⁴ The use of a 'Geordie' rather than a Davy lamp is critical to this statue. For the difference see Treasures for the Nation. Miners Lamps, p.108. Early 'Fishbelly' rails were short lengths about the size of a small salmon. Mid 19th Century Rails were between 30' and 40' in length.

³⁵ I.L.N., DeCentury 18, 1852, p.522

³⁶ Said, E, Orientalism, 1979, p.97



Figure 12. Pompeo Batoni. COLONEL WILLIAM GORDON, 1766, Oil on canvas, from Treasures for the Nation, 1998. Figure 93, p.136.

THE CIVIL ENGINEER: PORTRAYED

2. OILS

2.1 ROBERT STEPHENSON

By the middle of the 19th Century, there was an increasing interest among the growing professional middle class for portraits, but engineers appear to have been a minority compared to the other professions. One of the very few portraits of engineers now hanging in the National Portrait Gallery is an undated oil on canvas by John Lucas of Robert Stephenson (Fig.13). Seated on a red velvet chair with his legs crossed, he gazes directly at the viewer. Compositionally, it bears a strong resemblance to a 1747 painting by Allan Ramsay of Dr. Richard Mead derived from the conventions of 18th Century Aristocratic portraiture³⁷ (Fig. 14). Stephensons right hand rests on an engineering drawing, open on a table, of a 2.2.2. six wheeler, short wheelbase, long boiler locomotive³⁸. In 1843, the Paris Rouen Line used this new Stephenson design so we can date its English debut to about 1841/1842, which date places Stephenson around 40 years of age and at the peak of his career. The inclusion of the drawing of a locomotive, more than the pose, manifests his profession. Similarly, his wealth as the first millionaire engineer more than his professional expertise is invoked by Lucas's adoption of

³⁷ Manners and Morals, The Tate Gallery, 1987, p.176. Composition described as being of Baroque tradition. The painting is reminiscent of Hogarth's Captain Corram, also based on Baroque antecedents, p.172. Both these works are of 'commoners' but in a style previously reserved for nobles.

³⁸ Hollingsworth, B. Steam: Passenger Locomotives, 1982, p.32 has an indential illustration to the one on Stephenson's table.

traditional aristocratic iconography³⁹ (traceable back to at least Holbein) i.e. bold seated posture on expensively upholstered chair, formal clothing of participant, neutral background with absence of evidence suggesting manual or physical involvement. However this conservatism raises the issue of whether the artist or patron chose this imagery, as much as consideration of the relationship between social status and pictorial convention. What is once again absent is an endeavor to formulate a new pictorial language for a new class of public figure.

A public dinner held in honor of Robert Stephenson in the Central Railway Station of Newcastle, his hometown, in August 1850 included his friends and admirers as well as representatives of the Queen and local aristocracy. They came to pay their "...high respects to his scientific eminence and unblemished character; to do honor to the name Stephenson...inseparably interwoven with the great railway creations of the 19th Century"⁴⁰ Mention was made to his designs of the Menai Strait and Tyne High Level bridges and they acknowledged his genius. Significantly those particular engineering wonders were references made in his presence which were reinforced by the exposition of large associated art works.⁴¹ These reminders of Stephenson's accomplishments point to a novel use of visual representation: the exhibition of selected works at a public dinner in a railway station, to honor

³⁹ LL.N. April 5, 1862, p.433 Details of Stephenson's will. Handbook of Paintings, The Frick Collection, 1990, p.90. Thomas Cromwell, Circa 1539, also Hibbard, H. The Metropolitan Museum of Art, 1986, p.268, Benedikt Von Hertenstein, 1517 appear to confirm this.

⁴⁰ LL.N. Book 2 of 2, 1850, p.113

⁴¹ Ibid, p.113. Sculptures, paintings and huge murals are listed.

an engineer. Here was an unprecedented socio-artistic gathering to heroize the accomplishments of an engineer by art being used to signify socio-economic status. Stephenson in the guise of social hero declared that, "Hills have been cut down and valleys had been filled up; and when this simple expedient was inapplicable, magnificent viaducts had been erected; and where mountains had intervened, tunnels of unexpected magnitude had been unhesitatingly undertaken, bearing testimony to the indomitable enterprise of the nation and the unrivaled skill of its artists."⁴²

Obviously, Stephenson categorically endorsed railway construction in regarding it as the improvement of nature for social benefit, but the overtone of the setting was more that of a religious-imperialistic ritual than a dinner.⁴³ Even the 'skilled people' he referred to congratulated for their participation were described as artists and not as engineers. That affords an insight into the creative self esteem of engineers and into the conscious construction of identity and status. Chairman Henry T. Liddel added a political gloss when he observed that "By an iron union (railways), ...the three kingdoms in fact now seemed complete; that there was no longer any necessity for a separate government for Ireland."⁴⁴ This is an English-based directive aimed at a trilateral unity of populations under an English dominated imperialism and by referring to the bridging of the Menai Strait linking London and Ireland, an "invisible

⁴² Ibid, p.113, also Harvey, D. 1985, p.27. He states "Natural Landscapes are replaced by built landscapes." The debate is one sided when profit as a goal is introduced.

⁴³ Klingender, F. Art and the Industrial Revolution, 1975, p.134. He describes "cutting a swath" through Camden Town tenements for the London and Birmingham Railway in 1836. No mention of what happened to all the people. Dickens, C. Hard Times, 1981, p.104, Coketown and its demise to make way for a railway.

⁴⁴ LLN, Book 2 of 2, 1850, p.113.

deterrent” to insurrection, Barry called it.⁴⁵ No longer would English troops have to march up General Wade’s Road, now they could ride to the Highlands by train, hence no more 1715 or 1745 Royal Stewart lineage instigated uprisings. In this period of limited police forces, Guards from Wellington barracks could be moved en masse to Angelsey by rail then across to Dublin on the steamer independent of wind and tide. Although the primary reason put forward by the engineers for the expansion of the railways was rapid and safe movement of goods and people, politicians had their own agenda and the investors their own commercial goals.⁴⁶ Less frequently, humanitarian conditions assumed priority as in the scheme placed before Parliament for a railway line to Oban to provide employment to the local people.⁴⁷ The official reply was that “...the only remedy for distress in the Highlands is emigration.” This response nevertheless confirms the active role of engineers played in working for investors and landowners, seeing great profits in railway and emerging steamship transportation.⁴⁸

There were many different voices echoing the purport of Stephenson’s speech. Among these, not necessarily involving applications of engineering, was the transfer of the East India

⁴⁵ Barry, A. “Lines of communication and spaces of rule” in Foucault and Political Reason, 1996, p.128.

⁴⁶ Smiles, S. Life of George Stephenson, 1869, p.291, Hudson and Investors in the Market Place had more than a speculative interest, they wished to become very rich quickly.

⁴⁷ Harvey, D., 1985, p.11. He discusses vested interests, profits together with money, time and space utilization.

⁴⁸ I.L.N., March 20, 1852, p.242. What is missing from the reply is that 323,113 people emigrated from Britain in 1854 at the rate of 4,000 per week from Liverpool; 43,621 of them came to Canada.

Company's possessions to the British government in 1858.⁴⁹ This act and the subsequent change in the royal title of the reigning monarch set the tone for imperialism in the East which was one of the cornerstones of expansion in the 1850's.⁵⁰ Sir Bulwer Lyton's Bill before parliament for a Crown Colony in North America "beyond the Rocky Mountains" encouraged American engineers to contend that "The great Pacific Railway must of necessity follow a course through British territory."⁵¹ This statement elevated the status of engineers internationally for perhaps the first time on a political level and it obliquely outlines the government's reliance on engineers in Britain's imperial politics. Did John A. MacDonald use this example as a blueprint for a Canadian confederation anticipating an idea unheralded?⁵² (Fig. 15) As Burchell avers in Foucault and Political Reason "Government is an activity rather than an institution" which helps to place these individual scenarios into a related situation where a deconstruction of Great Britain in mid-century is a necessary step to understanding the flux.⁵³ It should be recognized that the reference is to a Greater England whose interest centered around, absorbed or purchased the other three partners, Wales, Scotland and Ireland.

⁴⁹ Thompson, D. England in the Nineteenth Century, 1964, p.167. After the Mutiny (1857-8), the British government abolished rule by the East India Company.

⁵⁰ Punch, September 11, 1858

⁵¹ ILLN., July 10, 1858, p.26. U.S. engineers were vocal and literate in their position for the proposed Canadian railway not to go through U.S. territory.

⁵² ILLN., July 10, 1858, p.26. Vancouver Island was to continue to remain a separate 'military' colony. MacDonald's political portrait pose in the popular press bears a strong relationship to ones of middle class professionals (see F.P.Smith, Fig.28).

⁵³ Burchell, G. "Liberal government and techniques of the self" in Foucault and Political Reason, 1996, p.21.

Stephenson's portrait in its composition suggests very strongly a pictorial representation of an ambitious engineer towards this flux. His upright seated posture with head held directly facing the viewer reinforced by the high collar and cravat together with the formal chair half covering heavy drapery, borrow much by past aristocratic representation. An absence of a coat or arms or a flowing robe are the two symbols which separate this representation from the one of magistrate Agostino Pallavicini who was an ambitious personage in Genoa in a time of flux. Robert Stephenson in his 1840 role was a mirror image ambitious professional as Van Dyke had shown two centuries earlier.



Figure 13. John Lucas. ROBERT STEPHENSON circa 1841, oil on canvas.
Original: National Portrait Gallery, London, Reg. No. 5792



Figure 14. Allan Ramsay, DR. RICHARD MEAD, 1747, oil on canvas, 93 X 57 ins., from Manners and Morals, The Tate Gallery, p.176.
Original in the Thomas Corram Foundation For Children.



Figure 15. THE HON. JOHN A. MACDONALD, PREMIER OF CANADA.
L.L.N., July 2, 1858, p.5

THE CIVIL ENGINEER: PORTRAYED

2. OILS

2.2 ISAMBARD KINGDOM BRUNEL

Railway development embodied a multiplicity of special interest groups. Located within the pro-railways group were the gauge contenders who in turn each had their own agenda. This fracture within engineering circles encompassing the different gauge proponents Brunel and Stephenson, eventually carried over into the political decision making process.⁵⁴ In the meantime, the representation of the engineer was also changing and moved from the more traditional seated poses to include those variations introduced by Hogarth for lawyers and other middle class persons, which ultimately were taken up by painters for middle class portrait imagery.⁵⁵ Did Brunel for example purposely commission a portrait to present himself not as a gentleman but as a professional? It can be inferred that engineers were following architects by attempting to control the balance between aesthetically pleasing works for society while striving to be accepted as a key part of that society. Brunel as a professional engineer, clearly embraced technical innovation pushing it as far as testing currently known

⁵⁴ Hobsbawm, E.J. Industry and Empire, 1970, p.190.

⁵⁵ Manners and Morals, 1987, p.137. Hogarth's "William Jones F.R.S.", 1740, p.177; Joseph Highmore's "Thomas Emerson" 1731; also Simon, R. The Portrait in Britain and America, 1987. Various portraits which meet this statement are summarized: Francis, A., "Charles Dickens", 1842; Bradley, W. George Fraser with a golf club, 1830; Chimmery, G. John Robert Morrison and his father's secretary, 1830; Drummond, S. Sir W.E. Parry, 1820; Skinning, A. Robert Boswell of St. Boswells, 1800.

limits on all manner projects.⁵⁶ The scale and structural complexity of construction material's stresses and strains, were beyond the cutting edge of 19th Century knowledge and Brunel pushed them beyond. Strengths of materials had not yet evolved to the point of formulating Hooke's Law, so that the width of a pencil line on a scale drawing could mean the difference between metal failure and excess weight leading to inefficiency in functionality and eventual economic loss for the operator.⁵⁷ Is this then one of the reasons why Brunel had a portrait painted by John Calcott Horsley in which he is portrayed less an aristocrat than as an engineer?(Fig.16) His relaxed posture and pose over a work desk littered with engineering drawings and contracts, while holding a pencil, indicate a less formal and more practical approach to representation suggested by John Scott Russell's philosophy. Russell who was Brunel's naval architect compatriot pointed out in his shipbuilding treatise, "As the pencil swerves a hairbreadth to the fuller or finer line, either that you are filling the owner's pocket or stealing away his just gains to gratify some meretricious task"⁵⁸

Comparing the I.K. Brunel 1857 portrait with the earlier Stephenson portrait, there are some dominant oppositions operating within the visual representations of these two engineers. While Stephenson on the one hand established a successful career leading to a very rich

⁵⁶ A few of the innovations would include: Broad gauge rails; iron ships; screw propulsion; large ships; use of wrought iron to replace wood or cast iron. 'Hookes Law' is a complex relationship between size and strength of materials, it is in most physics textbooks.

⁵⁷ Petroski, H. "Engineering - John Scott Russell" in American Scientist, Jan./Feb. 1990, pp.18-21.

⁵⁸ Ibid.



Figure 16. John Callcott Horsley. ISAMBARD KINGDOM BRUNEL, 1857. Oil on canvas.
Original: National Portrait Gallery, London, Reg. No. 979.

financial climax with the social standing of a seat in Parliament,⁵⁹ Brunel was the son of a well educated and knighted father, a visionary regarding the magnitude of engineering projects, (with many successes but some notable failures) and became a rich man, but one who died of health failure due to overwork.⁶⁰ The Brunel portrait by being unregal is in contrast to the “...transpositions idylliques” that Winterhalter was painting for Queen Victoria, where the composition highlights that the Head of State is now Queen of India and that her troops were occupying parts of China.⁶¹ (Fig.17) The First of May where the full military uniformed Field Marshall, the Duke of Wellington, kneels before Queen Victoria holding aloft a casket, in a position of homage is one of many paintings which pictorially supports this argument. Such compositions foster the myth that conquest is an exercise in imperialist benevolence with its civilization providing light to people otherwise in darkness.⁶² Instead, Brunel must have known that he lost the ‘Battle of the Gauges’ not on technical grounds but more complexly on

⁵⁹ I.L.N., Oct. 22, 1859, pp.400-1, obituary to Robert Stephenson.

⁶⁰ I.L.N., Sept. 24, 1859, pp.303-1, obituary to Isambard Kingdom Brunel.
Ellis, H. Railways, 1976, p.411.

⁶¹ Coignard, J. “Winterhalter: Violettes imperials” in Beaux Arts, Mars 1988, p.420.
Also The Portrait in Britain and America, 1987, p.25. Sir Francis Grant Queen Victoria, 1843.
The regal formality of this painting supports the theory of imperialism; Crown, Order of the Garter, gloves, satin gown, footstool, classical architecture and heavy drapery reflect the might of British imperialism in theory through art. In practice, the I.L.N. of Feb. 7, 1857 describes it as “The War with China” where Admiral Seymour was occupying mainland China to “...give safe guarantee to future trade.”
Punch, September 11, 1858, p.107

⁶² Tamaka, S. “A saga of resurgence shakes Japan’s myth”, from The Vancouver Sun, October 10, 1998, p.A21.
Piper, David. The English Face, London: The National Portrait Gallery, 1992. p.202



Figure 17. F.X. Winterhalter. THE FIRST OF MAY, 1851. Oil on canvas.
Christopher Lloyd. The Queen's Pictures: Old Masters from the Royal Collection, 1994, Plate 29, p.90

political ones.⁶³ By the power faction opting for the standard gauge it "...enabled threats (to the imperial government) to be responded to rapidly and effectively without the necessity of creating a detailed system of surveillance" as Barry succinctly describes it.⁶⁴ A single universal network of railways served to solve, as Harold Innes puts it, one "of the problems of empire".⁶⁵ Implementation of engineering philosophy in the industrialization of the country by such rapid means of transportation as railways reduces a likelihood of threats which require containment and appear to confirm the potential use for coercion being associated with engineering progress.

⁶³ Hobsbawn, E.J. Industry and Empire, 1972, Vol. 3, p.190.

⁶⁴ Hindes, B. In Foucault and Political Reason, 1996, p.124

⁶⁵ Ibid.

THE CIVIL ENGINEER: PORTRAYED.

3 DAGUERREOTYPE

3 ROBERT STEPHENSON

During the decade of the 1850's when Brunel was involved in steamship design, Stephenson was turning his hand to politics by representing Whitby, Yorkshire as its Member of Parliament. Bodo von Dewitz informs us that round about this time, Talbot's paper photography could not compete with the "silvery polish of the daguerreotype" but that Talbot through his business acumen "secured for photography a significant ranking" in the field of 19th Century art.⁶⁶(Fig.18)

The National Portrait Gallery's 1851 daguerreotype of Robert Stephenson must be examined within the context of the available new methods of representation the engineer. (Fig.19)

Moving from Stephenson's 1841 formal academic portrait to photographic representation, indicates that the newly emerging methods of representation pioneered by Fox Talbot and Louis Daguerre were gaining increased popularity. The fact that in 1844 the Duke of Wellington had his daguerreotype portrait recorded by Claudet, may not be a coincidence, as Claudet's composition offers few clues to the career of the sitter through picture

⁶⁶ Dewitz, Bodo von. "Daguerre oder Talbot" in Silber und Salz, 1989, p.20

content.(Fig.20) Identification of the 'Iron Duke is solely by personal recognition, except for the open collared military style jacket and light colored waistcoat, which is mentioned later concerning Sir John Fowler. If the Field Marshall and Prime Minister of Britain and her colonies, probably one of the most famous men of the earlier part of the century, patronized this new mode of representation, then there was every reason for the millionaire Stephenson, a four year veteran of Parliament, to do likewise. Taken by an unknown artist in 1851, the daguerreotype shows a head and shoulders three-quarter profile. Apparently deep in thought, his right forefinger is extended upwards, recalling familiar Renaissance rhetorical gestures.⁶⁷ Stephenson' gaze however is reminiscent of 18th Century Portraiture suggesting a contemplative frame of mind, or perhaps intended to evoke his regard of a high level bridge of his own design.⁶⁸ Daguerreotypes being one of a kind and non-reproducible, unlike talbotypes, certain questions, in particular the early practice of photographic practice needs to be because

⁶⁷ Pedretti, Century Studies for the Last Supper, 1983, p.28.

Jordaens, J. The Holy Family and St. John the Baptist, 1620-5 in The National Gallery Complete Illustrated Catalogue, 1995. NG 164, p.360.

Ibid. Netscher, Century A Lady At a Spinning Wheel, 1665. NG845, p.500

Gods, Saints and Heroes, The National Gallery of Washington, 1980

Isaac Blessing Jacob, C.1640, p.163.

Whedock, A. Vermeer: The Complete Works, 1997, Mistress and Maid, Circa1667, plate 25, p.55.

⁶⁸ Manners and Morals, 1987, pp.51-2, Five portraits by Sir Godfrey Kneller, 1705-21 considered by Elizabeth Erinberg of the Tate Gallery as the gentlemanly ideal of the early 18th Century portraiture.

Simon, R. The Portrait in England and America, 1987. Fig.9, p21, John Singleton Copley, Major General Auguste De La Motte, 1787. Rembrandt, Rubens and Van Dyke, 1995, p.89, John Lievens, Madchenkopf, 1630. Rosenfeld, M., 1982, Fig. 49, p.248, Portraits of Marie-Anne De Chateauneuf, Circa 1714.

daguerreotypes are mirror images of the original subject.⁶⁹ A comparison of Stephenson's oil on canvas painting with his daguerreotype confirms this by hair parting and shirt fastening and because of this reflected image representation, the question of whether or not there was any specific intention in which hand was used, will be left open.⁷⁰ (Fig.21)

If Robert Stephenson wished to have a distinct reputation as a member of a newly emerging social class, then this image is less about the persona of an engineer than of an affluent person expensively dressed. It could also be an attempt to formulate a small portable icon for personal reasons. Like Wellington's daguerreotype, this one of Stephenson was also cropped forcing the figure into an awkward shaped space, making the sitter's head appear overpowering. In total, it presents the viewer with an iconic form which could be read as modern in 1851. Perhaps it was this that he wished to convey when he declared "The locomotive engine independent of the railway would be useless, way plus engine is necessary to each other."⁷¹

⁶⁹ Geiges, L. And Matz, R. Trudpert Schneider Und Sohne in Silber und Salz, 1989, pp.260-1. Their investigation indicates that German daguerreotype photographers were utilizing this hand gesture for middle class Germans in this period.

⁷⁰ In nearly all cases of the use of the index finger/hand gesture being used or the cheek or chin, the left hand was seen in the image.

⁷¹ ILLN., August 10, 1850, p.114. Steam engines sans rails were used both in road transportation and agriculture up until World War II.

Whatever the precise intended meaning of this intriguing visual image or how much input the sitter actually had, it indicates the professional attainment of the engineer as a public figure, a member of the Institution of Civil Engineers and as a celebrity he selected the silvery polish daguerreotype in preference to the cheaper talbotype photograph.⁷²

⁷² Hoffman, D. and Wrocklage, U., "Die aguerres-typisierten Manner der Paulskirche" in Silber und Salz, 1989. This article compares the 'one off' daguerreotype to the mass produced lithograph used for journalism produced primarily to meet public demand. Secondly, the fact that the majority of the images in this study are of middle class and professional persons, indicates that the lower class persons probably used the talbotype for their portraits, pointing to a specific socio-economic association.

Also, Benjamin, W. "The Work of Art in the Age of Mechanical Reproduction", 1936 in Art in Theory: 1900-1990, p.515. He discusses the non-sensicality of producing an 'authentic' print from a photographic negative.



Figure 18. Trudpert Sneider, PORTRAIT OF A WOMAN, 1850, Daguerreotype 9X7 cms. Silber und Salz, German photography, 1839-1860, (Catalogue) Cologne and Heidelberg, Agfa Fots-Historama, 1989, Abb 40 (Kat 205).
Original: Private ownership

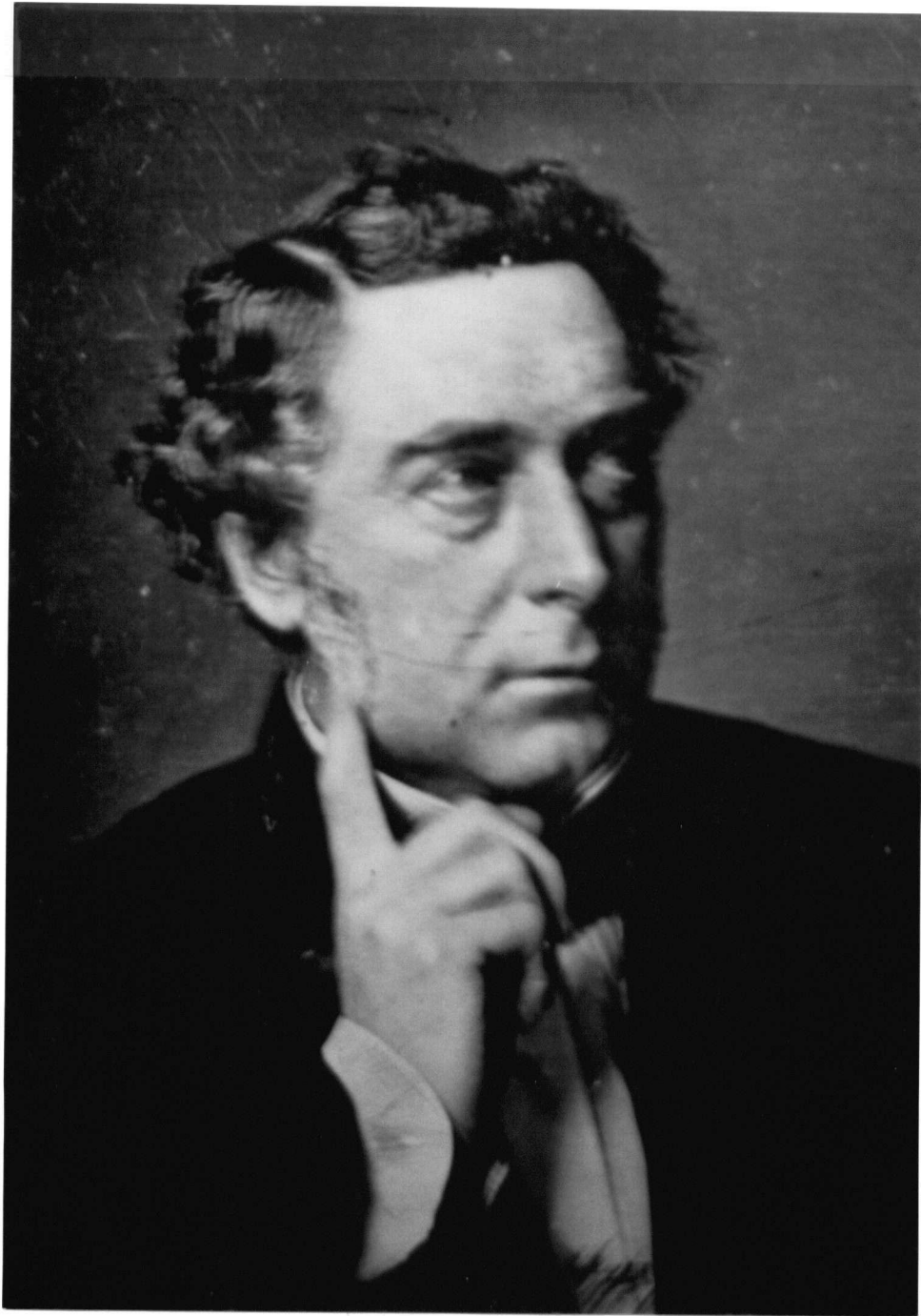


Figure 19. ROBERT STEPHENSON, 1851, Daguerreotype by unknown photographer.
Original: National Portrait Gallery, Reg. No. P4.



Figure 20. THE DUKE OF WELLINGTON by Antoine Claudet, 1 May 1844. Sixth plate daguerreotype, Art at Auction: The Year at Sotheby's 1984-85. Fig.1, p.159. Original sold Oct. 26, 1984 (26X84), Sotheby's London for US\$13,376



Figure 21. GEORGE GILBERT SCOTT, I.L.N., September 17, 1853, p.225

THE CIVIL ENGINEER PORTRAYED

4. PHOTOGRAPHY

4.1 I.K. BRUNEL

By the time of the 1851 GREAT EXHIBITION, Fox Talbot's photographic process was reliably established in the popular press, but due to technical constraints engraved prints were produced from portrait photographs. Such prints illustrating engineering projects and engineers were published frequently in the Illustrated London News, (I.L.N.) and Punch and in turn, engraved portraits of engineers were advertised by the I.L.N. and sold to the public by Maull and Polybank of Greenchurch Street, London.⁷³ This indicates the extent to which the multiple reproduction of imagery created a new opportunity for profit and consumption of popular art by the public.

The inclusion of engineers in the assortment of politicians, military, literati and the famous, enhanced recognition of the engineering profession as a whole, irrespective of the individual being imaged. Photography by its rapid execution and field of focus encouraged the use of more common symbolism usually related to objects such as a compass, dividers or a scroll or inclusion of the actual image of bridge or viaduct. Bringing in this type of material draws attention to the social and economic impact of engaging generally overlooked evidence

⁷³ I.L.N., November 15, 1856, p.508. Advertisement for photographs of 'Stephenson'. Engraved prints were more easily reproduced in newsprint than photographs in this period.

in academic art issues.⁷⁴

Through photography especially, the engineer's likeness could be purchased readily and integrated into the rising genre of celebrity-biography. With the discovery that developers using expensive platinum could be replicated by cheaper chemicals, photography became increasingly more popular as its popularity reduced its costs, which led to engineering works and consequently engineers being drawn to its greater use. One example is the plate size albumen print of Isambard Kingdom Brunel by Robert Howlett produced in 1857. (Fig. 22) He stands before the launching chains of his ship the Great Eastern which was to remain for over 40 years after his death the largest ship ever built. As a representation of one of the most famous engineers of the 19th Century, the image is an unusual one inasmuch as the background of huge forged iron chain links present Brunel almost as a secondary subject. On one level, the chains can be read as having been intended to invoke the idea that Brunel with his power of technical analysis and invention was one link amongst the hundreds of workers, forged together in engineering expertise and manufacturing to build this giant ship.

What is seen is a remarkably informal unidealized representation of a man sufficiently famous and modern, to flaunt convention.⁷⁵ As an engineer attired in his working clothes and in an engineering environment, he could be perceived as Stephenson alluded in his speech, an artist implementing his visions.

Woodward in his work on 'Reform' argues emphatically against other scholars that

⁷⁴ There is probably a parallel here with 17th Century Dutch genre art.

⁷⁵ Few academic works show dirty shoes.

Brunel was not dressed in a fashionable manner.⁷⁶ Why then the deshabillement? His associates and shipyard workers would normally have seen him in the clothes in which he is portrayed so that a purchased photograph of him in such garb would not have been unusual. This was a visual image of an engineer for a particular market, one in which there was empathy for what Brunel was doing.⁷⁷ Posing for the chain photograph in dirty disheveled clothing may have served as nothing more than to be seen differently to Stephenson. If Brunel wanted to make an engineering point, large gauge tracks, large ships, large links, large repetoired engineer, in contrast to Member of Parliament Stephenson widely respected and socially accepted, then this was one way to do it. The whole subject of the social significance of Brunel's clothing and boots and how we may read or misread codes or meanings is touched on by Clark when he informs us that some artists "...switch codes, lay false trails..."⁷⁸ Maybe Howlett was purposely providing an image which would encourage viewers to contemplate the real role of the engineer in society whatever that might conceivably be.⁷⁹ A comparison of this

⁷⁶ Woodward, Sir L., The Age of Reform 1815-1870, 1962, p.596

⁷⁷ Part of this 'market' consisted of prints given as 'keepsakes' to associates and assistants. Freely given they encouraged empathy and loyalty from recipients, provided profits for the printer and ensured that the donor received publicity. Piper, David. 1992. p.216. Piper engages in a comparison of this photograph and Horsley's oil painting of Brunel, following the line of multi-different representations of the same person may be the action of the artist and not the patron.

⁷⁸ Clark, T.J. "On the social history of art", in Image of the People, 1973, p.18

⁷⁹ In the mid-19th Century, it is conceivable that not everyone knew what an engineer was, what he did or indeed who he was. Portrait prints in the I.L.N. gave no symbolic clues on the profession of the sitter. Klingender, F. discusses the implications of this in his Art and the Industrial Revolution, 1947, p.421.

picture with a Frank Meadows Sutcliffe photo of an 'old salt' provides some answers. (Fig. 23)

The almost identical compositions, four button vests; left hand in pocket; open jacket; dirty pants and boots; smoke producer in mouth; source of career in immediate background and commanding posture could almost be regarded as a collusion if they were not related to the photographic medium, being used as an art form. By Brunel posing in such an informal manner it supports the argument that Brunel was not trying to prove anything, he had already done this a dozen years earlier when he designed the wide gauge which was a giant engineering leap from the old Flemish artillery carriage width of Stephenson's gauge.⁸⁰

⁸⁰ Muller, J. A Treatise on Artillery, 1780, p.109, Muller is very unreceptive to the use of the Flemish artillery carriage wheel gauge of 4' 8".

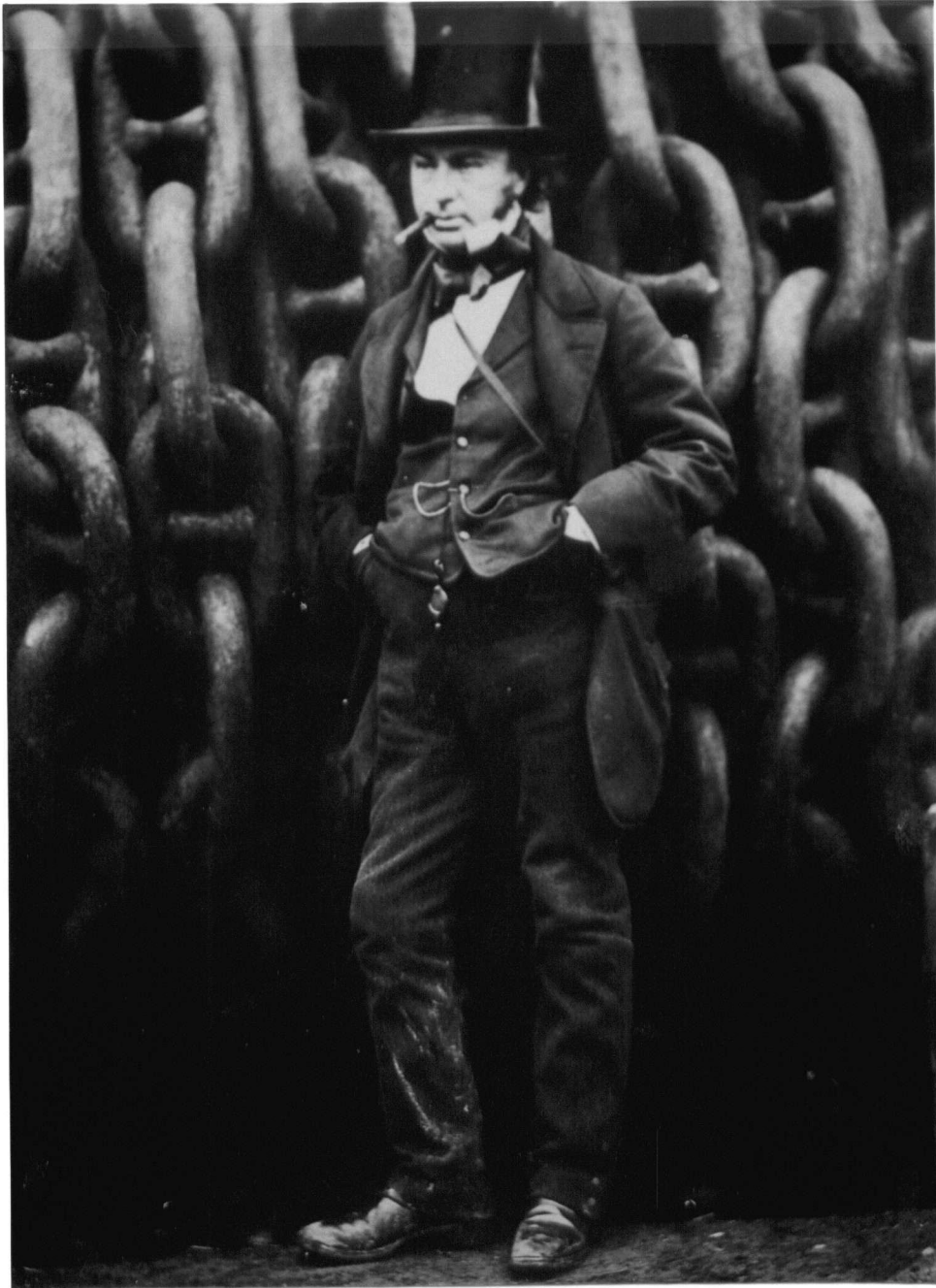


Figure 22. Robert Howlett, ISAMBARD KINGDOM BRUNEL STANDING BEFORE THE LAUNCHING CHAINS OF THE 'THE LEVIATHAN', (THE GREAT EASTERN). Albumen print, 1857, 10.25x8ins. From Sotheby's Art at Auction, 1986-87. P.171. Original in the National Portrait Gallery, London.



Figure 23. Frank Meadow Sutcliffe, *THE SKIPPER AND THE MATE*, 26-35B, from Bill Eglon Shaw, *Frank Meadow Sutcliffe*, 1982. Photograph. Original from glass plate negative of circa 1850, The Sutcliffe Gallery, Whitby, North Yorkshire.

THE CIVIL ENGINEER: PORTRAYED

4. PHOTOGRAPHY

4.2 JOHN FOWLER

Photography was used as a new medium to present the relatively new engineer class through a modern means of representation. But this does not mean that they all had to follow the 'informal' poses of Howlett. One different type of photograph was a hand coloured albumen print by Mayall of John Fowler C.E., the Chief Engineer of the Metropolitan Railway Company and a contemporary of Robert Stephenson. (Fig.24)

Unlike Brunel, Fowler wears a lighter coloured and more formal day dress but he is hatless and stands central to two background church towers which can be read to represent classical landscape, a pictorial convention associated with aristocratic representation. The railway behind which he stands is not the only direct link to industrialization but his left hand on the iron bridge parapet places a visual emphasis on Fowler's bridge construction. At 48 years of age, he was not yet a baronet, however he was a successful railway engineer where his speciality of tunnel building by the 'cut and fill' method would eventually be used to perfect the London Underground system.⁸¹

What we do not see is the toil of two dozen men needed to roll each piece of rail heated to 1000 degrees Celsius, then the labour of another eight men to lay it on the railbed. Nor do we see some of the toil and working conditions which are associated with producing rails as

⁸¹ As engineer of the London Metropolitan railway, Fowler was a pioneer in excavating from the surface and then covering in the track, this was quicker and more economical than the later deep tunneling required for the 'tube'.

illustrated in the popular press, however we do not know whether or not the workers were satisfied with their low wages and poor diet.⁸²(Fig. 25) John Jabex Mayall the photographer set up his tripod so we can observe from the railchairs that the gauge is 'standard' and opposite Fowler's feet, notice the new four bolt fishplate, an essential load-bearing device to join the rolled wrought iron rails.

Bartolomeo Nazzari's portrait of Samuel Egerton in 1732 was later described in Rudiments of Genteel Behaviour by Nivelon and exemplifies a traditional aristocratic pose.⁸³(Fig. 26) Fowler adopts a variation of this connoted pose in his photographic portrait in that he stands with his right hand in pants pocket holding back a frock coat to reveal his buttoned up, light coloured silky material waistcoat.⁸⁴ Since yellow waistcoats were worn by northern landowners as a mark of their social position and as Fowler's father was a professional land surveyor raising his family in Wadsley Hall Sheffield, (a few miles east of Lombe's silk mill on the banks of the Derwent), his clothing confirms Fowler's double role of

⁸² Wages, diets and health are beyond the scope of this paper. See LLN, Book 2 of 2, 1853, p.137.

LLN, Nov. 22, 1862, p.561

Punch, Jan. 22, 1859, p.35

Hertzlinger, R. 1998, p.60.

There is an excellent example from the School of Raphael of a Young Man in Red, Circa 1505, oil on panel showing the subject standing hand on ledge, centrally between two classical columns, before a vast treed landscape.

⁸³ Simon, R., 1987, P.75

⁸⁴ Yorks/Lincs oral tradition informs us of yellow waistcoats being worn by landed gentry.

engineer and middle class landowner.⁸⁵

Building iron railways, their engines and passenger terminals may well have been a fortunate leap of faith on the part of some engineers such as John Fowler who eventually because of his service to engineering, (and of course the government), was created a baronet. Others less fortunate often had to wait a long time before they knew if their plans could be implemented. Parliamentary committees were established to assess each case which often dragged on months each faction having their own agendas and timetables.⁸⁶

⁸⁵ Fowler like Fox Burgoyne was of middle class.
Klingender, F. discusses this in Art and the Industrial Revolution, 1947, p.421.

⁸⁶ Robbins, M. "Thomas Longridge Gooch 1802-1852" in The Newcomen Society, Volume 56, 1984-5. P.63

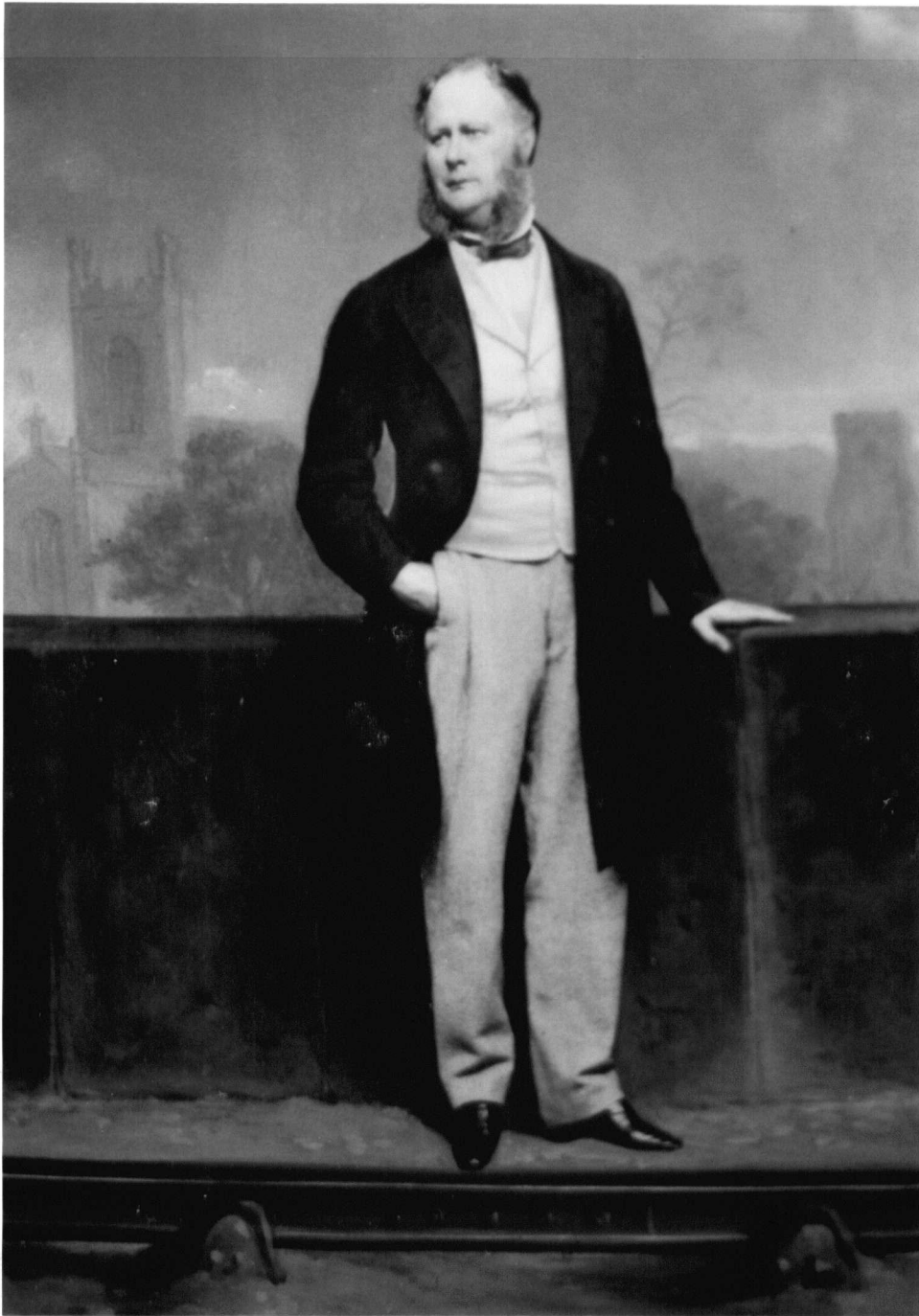


Figure 24. John Jabuz Mayall. SIR JOHN FOWLER, 1865. Albumen photograph.
Original: National Portrait Gallery, Reg. No. P326.

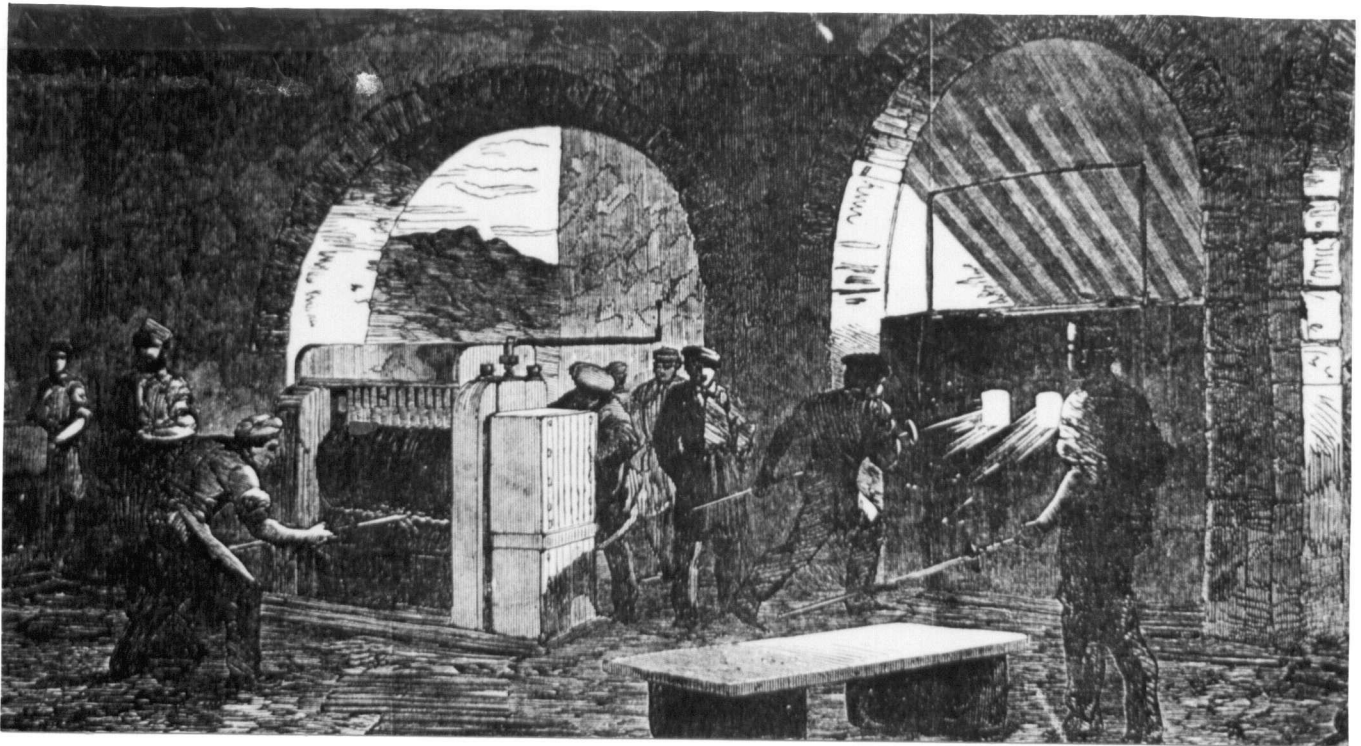


Figure 25. ROLLING IRON IN ROLLING MILL, I.L.N., April 28, 1855, p.410



Figure 26. Bartolommeo Nazzari, SAMUEL EGERTON, 1732, 82X62 ins. oil on canvas from The Treasure Houses of Britain, (catalogue) 1986 Gervase Jackson-Stops (ed). P.258. Original in National Trust, Tatton House and Park

One engineer wrote, "Day after day was spent by me in close committee rooms of the Houses of Parliament waiting to give evidence, for or against some project.⁸⁷ Is this a case of sciencization of politics where political decisions were transposed into technical ones or the converse where technical decisions obtained political approval?⁸⁸ Some of the press reports were so pro-railway that they appear to be ad hoc advertising, one report stating "Next to the invention of printing, railways must be regarded as the mightiest engine of modern civilization."⁸⁹ A powerful feudal aristocracy opposed the change." This must be the same civilization to which Smiles referred. We may ask about the "powerful feudal aristocracy who were opposed to change" and the working class poor who could now travel by train on excursions.⁹⁰ The opposition of the former was overcome by parliamentary legislation and the attitude of the lower classes, who according to Elizabeth Helsinger, "...became tourists instead of revolutionaries", answers the latter.⁹¹ It is conceivable that it would be the literate classes in

⁸⁷ Ibid. p.63

⁸⁸ Barry, A. "Lines of Communication and Spaces of Rule" in Foucault and Political Reason, 1996, p.135.

Habermas, J. "The Transformation of the Public Sphere: An Inquiry into the Category of Bourgeois Society", 1962, p.105.

⁸⁹ LLN., August 28, 1852, p.170. The popularity and publicity of rail travel were closely allied although not necessarily dependent upon each other.

⁹⁰ Thompson, D. 1950, p.43. See also Woodward, Sir Llewellyn. The Age of Reform. 1962, p.596. The government passed a bill in 1844 that the G.W.R. offer rail travel at one penny per mile on certain specified days.

⁹¹ Helsinger, E. "Turner and the Representation of England" in Landscape and Power, 1994, p.107.

between these divisions that would be the part of the Smiles 'civilization' into which Fowler's photograph would be received. There is considerable significance in Fowler being prepared to pose for Mayall's camera alongside a railway track in what appear to be lightweight shoes and wearing no hat. Perhaps he had just received the news that he was to be selected as the next President of the Institution of Civil Engineers and wished to record his newly acquired stature.⁹² If so, then this colored rendition adopts a traditional aristocratic pose within a framework of old and new iconography. Its mixed message clearly represents is a marriage between a traditional picturesque background rendition and a foreground imposition of a radical departure, the iron rail of industrialization.⁹³

⁹² Fowler was elected President, Institution of Civil Engineers in 1865.

⁹³ The portrayal of Fowler *behind* the joined rail may be unique.

THE CIVIL ENGINEER: PORTRAYED.

5. PRINTS

FRANCIS PETTIT SMITH

Yet another way to acknowledge individual engineers and their achievements was the publication of testimonials by a print or photograph. Testimonials were usually paid for by private subscription and the occasion was often marked by a dinner with a famous engineer as the guest speaker.⁹⁴ This is an interesting indication of the way engineers were beginning to enter the socio-cultural scene, somewhat like other professional joining the exclusive Royal Society and Royal Academy.

Public dinners for the presentation of testimonials were likewise generally private affairs with the newly emerging middle class engineer responding to a need to bond with his fellow professionals. One testimonial of note was the one to Francis Pettit Smith, inventor of the screw propeller.⁹⁵ The guest speaker was Robert Stephenson, the main body of guests being engineers and shipbuilders who had knowledge of the Archimedes screw as a method of steamship propulsion. Sailing ships were economically efficient but unwieldy in confined sealanes and paddle wheels were grossly inefficient, requiring multiple steam engines to power them. So this testimonial was a fitting climax to Smith's career as an inventor and co-

⁹⁴ I.L.N., Book 2 of 2, 1850, p.113
I.L.N., June 2, 1855, p.539

⁹⁵ I.L.N., April 26, 1856, p.428.

researcher with Brunel on the practical application of the screw propeller and its substitution for paddle wheel drive in both the Royal Navy and Merchant Marine. (Fig.27) His likeness was published from a photograph by Lawrence on a print showing only head and shoulders and it is interesting to note that it does not provide any positive reference to the sitter as an engineer.

(Fig. 28) Unlike other contemporary prints from photographs which show middle class males in daydress, holding watchfobs or documents,⁹⁶ Smith appears to be wearing evening dress with a monocle cord around his neck and is almost identical to portraits of William Hopkins, M.A., F.G.S., President of the British Association; Brandreth Gibbs, Honorary Secretary of the Smithfield Society, Bransby Cooper F.R.S. and Humphrey Brown, M.P. for Tewkesbury. (Fig. 29)

In these related prints there is no direct signifier present to establish social class. What can be discerned from their comparison is that engineers as a new emerging professional group were being represented in an identical manner to other professional groups, architecture, science and the Arts.

Because of their apparent similarity it could be argued that the composition of popular press portrait prints showing engineers in the same manner, pose and dress as other middle class professionals, was not chosen by the sitter as patron, but rather by the artist as originator of the print.⁹⁷ It also indicates that there was a very specific visual vocabulary in place which the audience could immediately access and understand.

⁹⁶ Silber und Salz, 1989, p.414.

⁹⁷ It may have been the journal lithographer's rendition and not the original artist's composition.

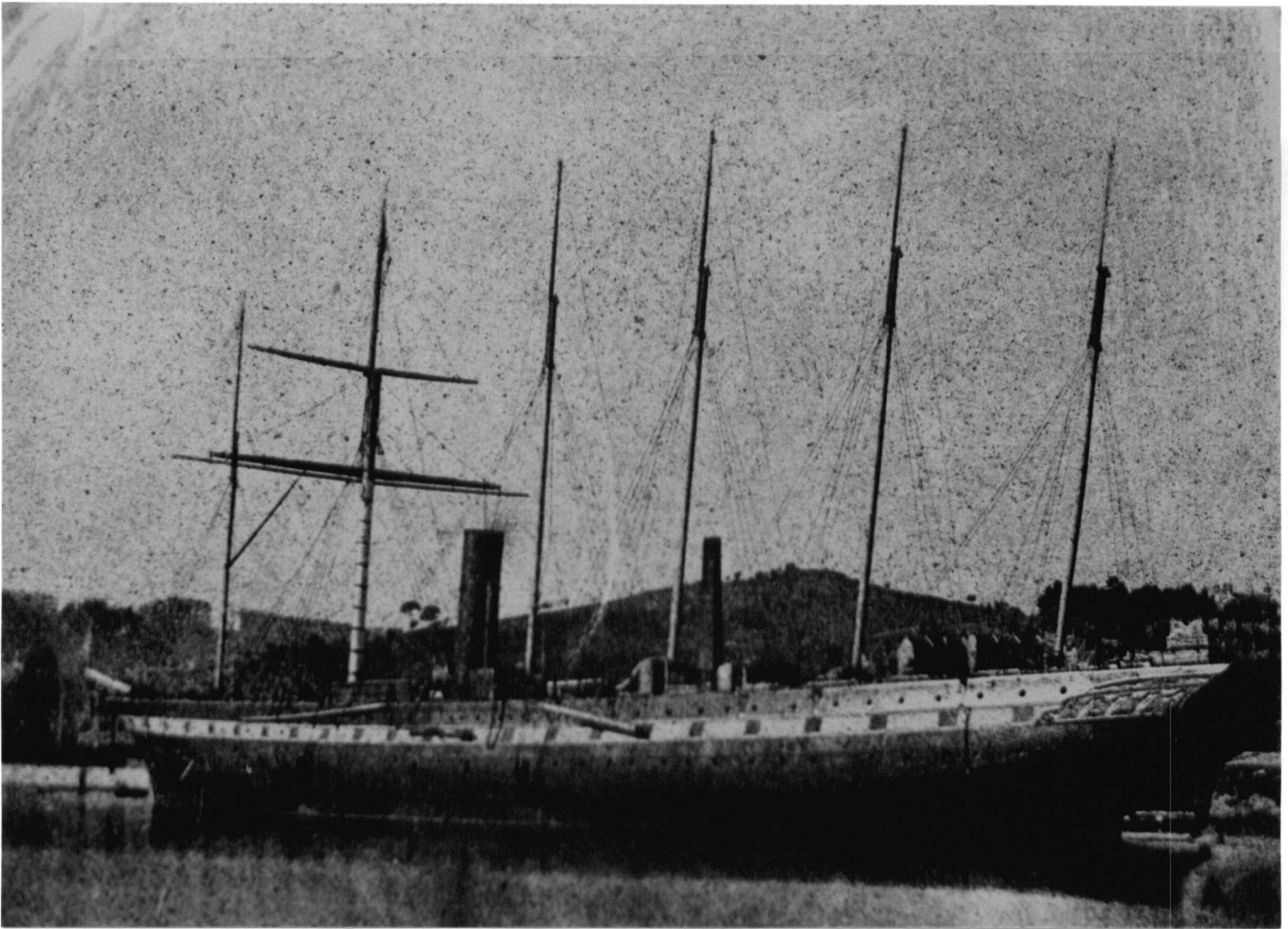


Figure 27. S.S. GREAT BRITAIN by unknown photographer from Treasures for the Nation, (catalogue), The National Heritage Fund, 1988.
Original photograph taken in 1845. No further details.



Figure 28. MR. FRANCIS PETTIT SMITH., LL.N., April 26, 1856, p.428

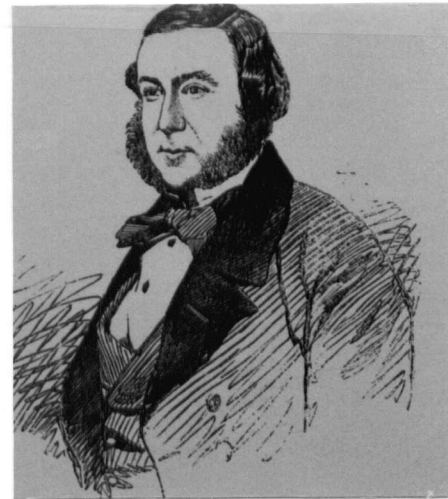
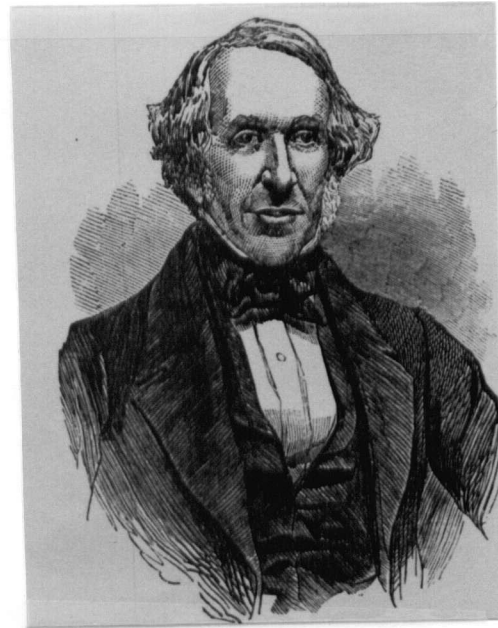


Figure 29.

Top L.H. Mr. HUMPHREY BROWN, M.P. FOR TEWKESBURY. Lithograph, from I.L.N., 1853, #1 Vol. 22, p.309.

Top R.H. WILLIAM HOPKINS, ESQ., M.A., President of the British Association, 1853, Lithograph from the I.L.N., September 17, 1853, p.225.

Bottom R.H. MR. BRANRETH GIBBS, ESQ., Secretary of the Smithfield Club. Lithograph from a daguerreotype by MAYALL from the I.L.N., December 22, 1855, p.725.

Bottom L.H. MR. BRANSBY COOPER, F.R.S. Lithograph from a photograph by Mayall from the I.L.N., August 27, 1853, p.165.

What is absent in the testimonial to Smith is Britain's imperial agenda; this is the importance that government and engineering interests took in industrial naval construction to control world commerce through naval supremacy.

After the quashing of the Indian Mutiny, the British turned their naval power towards China, climaxing with Admiral Seymour's capture of the Cantonese forts in 1856, by steam driven screw propeller ships.⁹⁸ Without the application of Pettit Smith's knowledge of naval engineering, this action would have been virtually impossible due to the inability of large sailing ships to manoeuvre against wind and tide in the confined China Sea waters. Acts of aggression like shelling Cantonese forts enabled by advanced engineering technology, helped realize the prediction of British supremacy expounded by Stephenson at Newcastle and ensured the implementation and acceptance of British policy. Engineering was manifestly synonymous with imperial progress and progress with engineers.

However successful engineering inventiveness and application was in theory, it did not always translate into engineers' acquisition of wealth in practice. Despite the strategic implementation of his screw propeller, Smith received only a relatively small pension from the Civil List related directly to the interpretation and application of patent laws, reportedly the cause of downfall of many ambitious engineers.⁹⁹ An additional factor was that although many engineers worked hard to make their brotherhood truly professional, the competitiveness within the engineering fraternity, due to patent law infractions, often belied their

⁹⁸ ILLN. February 7, 1857. 'The War with China' to protect British trade.

Grant, Century "America's ever mightier might" in The World in 1998, 1998, p.72, analysis of use of new military technology versus domination.

⁹⁹ ILLN., April 26, 1856, p.428.

professionalism pointing to a fracture within engineering as a whole.¹⁰⁰

Apart from the prints specific to important or famous people or events was another type of print produced for a particular market, this was the railway print of the Great Western Railway (G.W.R.) by J.C.Bourne which will be addressed.

¹⁰⁰ Ibid.

CHAPTER IV

THE CIVIL ENGINEER: HIS WORKS AND SOCIETY

1. Lithographs by J.C.Bourne: The Great Western Railway (G.W.R.)

Many railway depictions were commissioned privately and composed of watercolors, wash drawings, steel engravings and lithographs. Some were distributed and sold directly to the public, others used as illustrations in the popular press and still others as book illustrations. Brunel's Great Western Railway (G.W.R.) may not have become so well known to the public if it had not been publicized in an 1846 book The History of the Great Western Railway, which contained numerous specially commissioned prints by J.C. Bourne.¹⁰¹ These visual images were provided for a different area of consumption to those shown in the popular press by having a political platform as well as a pictorial and narrative one, doubtless serving a similar role as did Turner's prints in his Picturesque Views of England and Wales series.¹⁰² (Fig. 30)

Bourne's lithographs were of two types, those highlighting progress as the incursion of railways across the national landscape and those showing progress by the engineering insight of the G.W.R. such as Brunel's marvel the wide gauge track. Both are highly politicized and

¹⁰¹ Bourne, John Cook, London (1814-1896), painter and lithographer not to be confused with Bourne, James, London, 1773. Sutton Coldfield, 1854, civil engineer. Author of Indian River Navigation: A Report, W.H. Allen & Co., London, 1849 and Railways in India, J. Williams & Co., London, 1848. For J.C. Bourne's life: See Elton, A. "The Piranasi of the Age of Steam" in Country Life Annual, 1965, pp.38-40.

¹⁰² Whitaker, T. An History of Richmondshire, 1823.
Shanes, E. "New light on the 'England and Wales' series in Turner Studies., Vol. 4, No. 1, p.52.
Wilton, A. J.M.W. Turner, 1979, p.175

indicate an underlying advertising agenda which shows that engineers were changing the world. Yet at the same time, the image's very format was to induce the viewer to accept them as picturesque.¹⁰³ Copley and Garside inform us that tourism was already established by this time, so that Bourne's prints would provide an excellent form of pre-travel knowledge for the wide-gauge rail traveler.¹⁰⁴ Furthermore, rail excursions were becoming the cornerstone, according to Elizabeth Helsinger "...in a further extension of the franchise".¹⁰⁵ These two associated factors allied with the engineer's drive to provide the requisite web of iron rails and the G.W. R. to provide the transportation contributed to set up a binary opposition against anti-railway expansionists who were vociferous in rejecting the new industrial progress.¹⁰⁶ Consequently, it was rather expedient of the railway companies to put forward visual material which would counter any reference to despoilation of the countryside by railway construction. Railway scholar McCoubrey calls Bourne a "railway artist" which places both Bourne and his works in a category which particularizes and isolates them from landscape artists.¹⁰⁷ Furthermore, T.J.Clark, art historian, provides a clue to the disposition of Bourne's work when

¹⁰³ Klingender, F. Art and the Individual Revolution, 1975, p.140. The History and Description of the Great Western Railway was published by David Begue in 1846 and Bourne was commissioned by Charles Cheffins to execute the prints.

¹⁰⁴ Copley, S. and Garside, P. (Eds.), The Politics of the Picturesque: Literature, landscapes and aesthetics since 1770. 1994, p.9

¹⁰⁵ Helsinger, E. Turner and the Representation of England, 1994, p.107.

¹⁰⁶ Hilton, T. The Pre-Raphaelites, 1991, p.158, Ruskin and Carlyle were among the authors.

¹⁰⁷ McCoubrey, J. "Times' Railway: Turner and the Great Western Railway" in Turner Studies, 1986, Vol. 6, No. 1, p.36

he stresses that one needs to deal “with the relationship between the work of art and its ideology.”¹⁰⁸ With the railway images it was the railway itself which was an icon signifying peace, tranquility and sanguinity, introduced by the engineer in his role as the improver of life on behalf of the investors and landowners who held control. Of course railway companies as well as governments established their own traditions and history to make political points and represent what they wished to have interpreted as the truth. A typical example of this is the preponderance of railway coat of arms registered with the College of Arms each with its pseudo ancient supporters and motto.¹⁰⁹ This is just one of the many attempts to replicate nobility. Individual liveries; badges; brass button sporting mottos; regimented uniformed and titled workers such as station master, guard, collector, porter, employed in neo-classically designed edifices support this argument.

1.1 Bourne’s Bath Hampton summarizes the G.W.R. philosophy of rail travel as do similar views in his complete series. (Fig. 31) What is portrayed is a landscape highlighting a small village of cottages with an old parish church in the background adding a semblance of the Picturesque to the composition. Trees and the presence of cows in the immediate foreground make the case for the pastoral with the sole human in the picture feeding animals through a gated doorway helping to canonize the scene as tranquil English landscape. A road bridge and church visible behind the cottage illustrate this picturesque scene, but by a clever positioning

¹⁰⁸ Clark, T.J., “The conditions of artistic creation” in Times Literary Supplement, May 24, 1974, p.562

¹⁰⁹ Hollingsworth, B. Steam: Passenger Locomotives, 1982, p.57



Figure 30. J.M.W. Turner. PRUDHOE CASTLE, NORTHUMBERLAND, Circa 1826. watercolor. Andrew Wilton, J.M.W. TURNER: HIS ART AND LIFE, Fig. 187, p.175 Original in the British Museum, London, (Cat. No. 798)

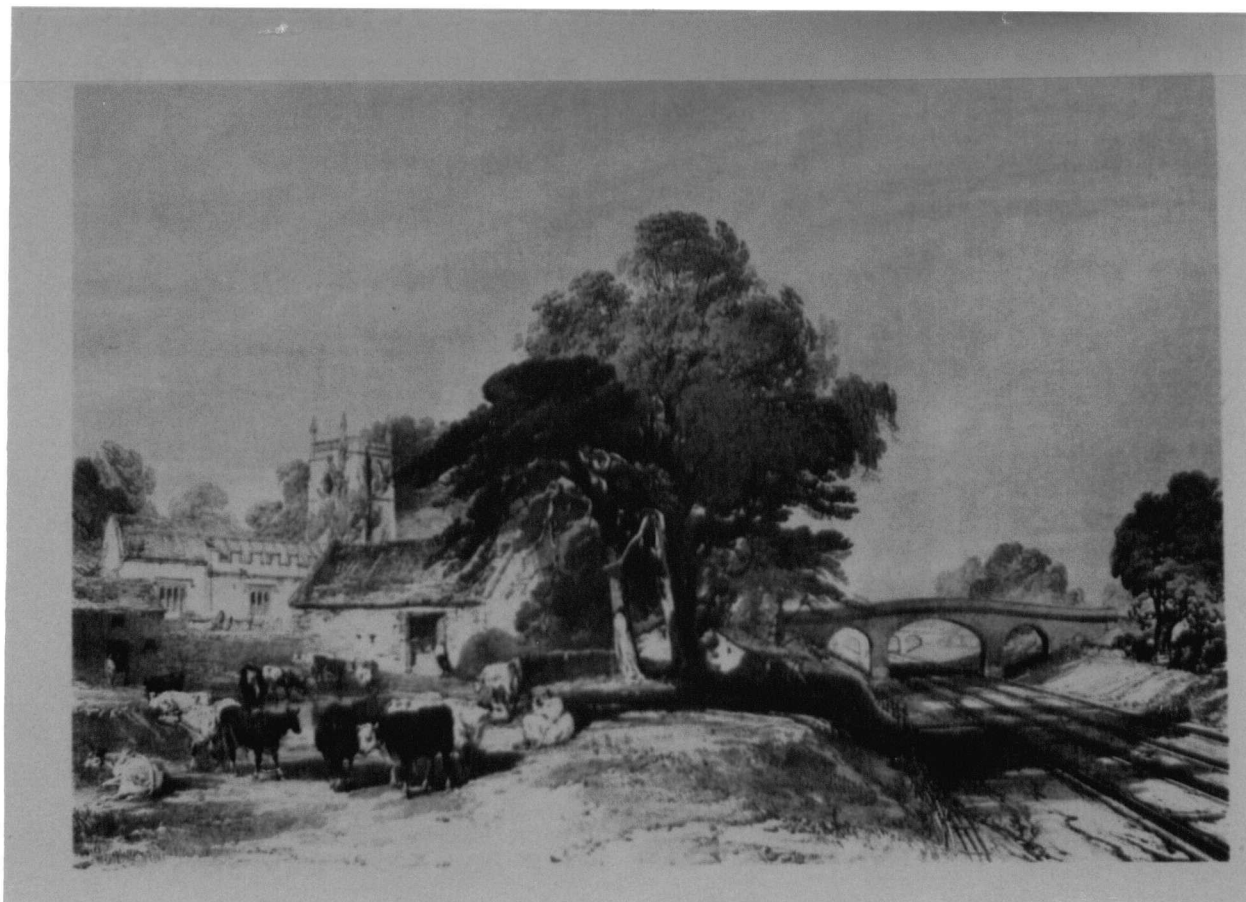


Figure 31. J.C. Bourne, BATH HAMPTON, Lithograph. From Turner Studies, Vol. 6 No. 1 p.36.

Original from History and Description of the Great Western Railway, 1846

of a diagonal railway cutting occupying only a relatively small area of the picture space and bursting out of the picture plane, the viewer is presented with an heroic feat of engineering. This was what was meant by Stephenson describing his ability to conquer nature, but what Bourne's print shows is that this was done without disturbing or desecrating the landscape, only enhancing it. Again, the viewer is presented with a void, no black smoke belching behemoth comes hissing and clanking down the track. No whistle sounding with its steam escaping to atmosphere to frighten the cows, make the farmer cease his work to look up and wonder why his farm has been divided to the perceived benefit of excursionists looking out of train windows. The picture conveys pastoral peace, agrarian manual work versus mechanization. There is no evident critique of the carving up of the farmland by an unwelcome political decision, only a subtle gesture to promote the railway as a beautiful, beneficial economic institution.¹¹⁰ According to McCoubrey's 1986 critical analysis of railway lithographs, "The illustrative railway artist was required to show both the scenery and the engineering in an easy accommodation with each other."¹¹¹ This puts Bourne in a place of showing scenery pleasing to the eye of the nature lover, conversely by showing the railway as a static part of the countryside devoid of mechanically propelled objects, any negativity of industrialization is not too obvious.

Railway development was originally for transportation of mineral wealth owned

¹¹⁰ Robbins, M. 1984-5, P.63. Gooch quoted, "Engineers were liable to be called ...to be prepared at all points to meet opponents equally active and skillful."

Harvey, D. 1985, p.33, "Purchase of private property rights seems exclusive rights to dominate a parcel of space."

¹¹¹ McCoubrey, J. 1986, p.36.

primarily by the landowning class. Hampton village is adjacent to the beautiful Regency architecture of Bath with all its connotations of high society taking the waters. What is missing from Bath-Hampton is the visual indication of the likely despoliation of the countryside through coal mining operations which would chiefly benefit the landowners and investors.¹¹²

1.2 A Bourne lithograph of Bristol #1 Tunnel shows a close up of a Brunel designed locomotive under steam but stationary, accenting its importance schematically by juxtaposing it with the classically arched tunnel entrance. (Fig. 32). The picturesque monumental masonry belies the hard and hazardous labor which produced it.¹¹³ Gentlemen spectators walk their dog alongside the broad gauge track, no mention is evident of locomotives being dangerous, nor the fact that the line is on private property with built in anti-trespassing laws for imposing fines in aristocratic terminology.¹¹⁴ In an attempt to popularize the railway, we are directed from the image to believe that gentlemen, that is those born to or possessing wealth, were excused from those laws of trespass and their dogs allowed to wander free.

Following the Enclosure Act of 1845 and after railways were built, fenced and policed, the public had no access to them other than by ticket purchase at places of admission. Payment of a token entrance charge was nothing more than an acceptance of the social power of the

¹¹² Although Bath is across the River Severn from South Wales, the coalfields are very near.

¹¹³ ILL.N., Book 1 of 2, June 13, 1857, p.579, 80 Hanbeck Quarry.

¹¹⁴ All railways in England were fenced in with prominently disposed non-deteriorating cast iron no trespassing signs advertising fines in guineas (not pounds sterling), for breaking the law.

railway company, through parliament, to control the space and actions of people using it.¹¹⁵

Allowing trespassers would have subverted the G.W.R. director's agenda so that it became another way of curtailing freedom of the public from what might have been right of access to open space. By virtue of their specialized knowledge, engineers were therefore part of a legitimate coercive force syndrome acting on behalf of the rich and powerful. Omission of 'no trespassing' signs as well as the presence of intruders onto the line, were in conflict with Great Western Railway policy. Bourne's print by pointing to contraventions downplays the power of the railway company to shape space, which is also as Harvey notes, "...a power to influence the processes of societal representation."¹¹⁶ There is another reading to this print. The G.W.R. was in the business of taking passengers on excursions and by stopping the locomotive at the end of the tunnel the passengers would all have been sitting in both darkness and a smokey atmosphere. To a potential traveler on the G.W.R. the print fails by its prioritizing pedestrians, to metaphorically relegate paying passengers to a secondary role. By its content and omissions, contrary to its original goal which was to promote the Great Western Railway as a preferred means of travel, it does the converse by showing what is tantamount to either a breakdown or the exhibition of a locomotive to inquisitive onlookers. This is why Bourne's prints although belonging to a 'canon of works' influenced Foster into summarizing that it "...makes more commitments than it can ever explain."¹¹⁷ Although this may not be strictly true in all cases, there is certainly ambiguity in many of them.

¹¹⁵ Harvey, D. 1985, pp.18 and 23.

¹¹⁶ Ibid, p.103.

¹¹⁷ Foster, K. "Critical History of Art" in New Literary History, Spring, 1972, p.460.

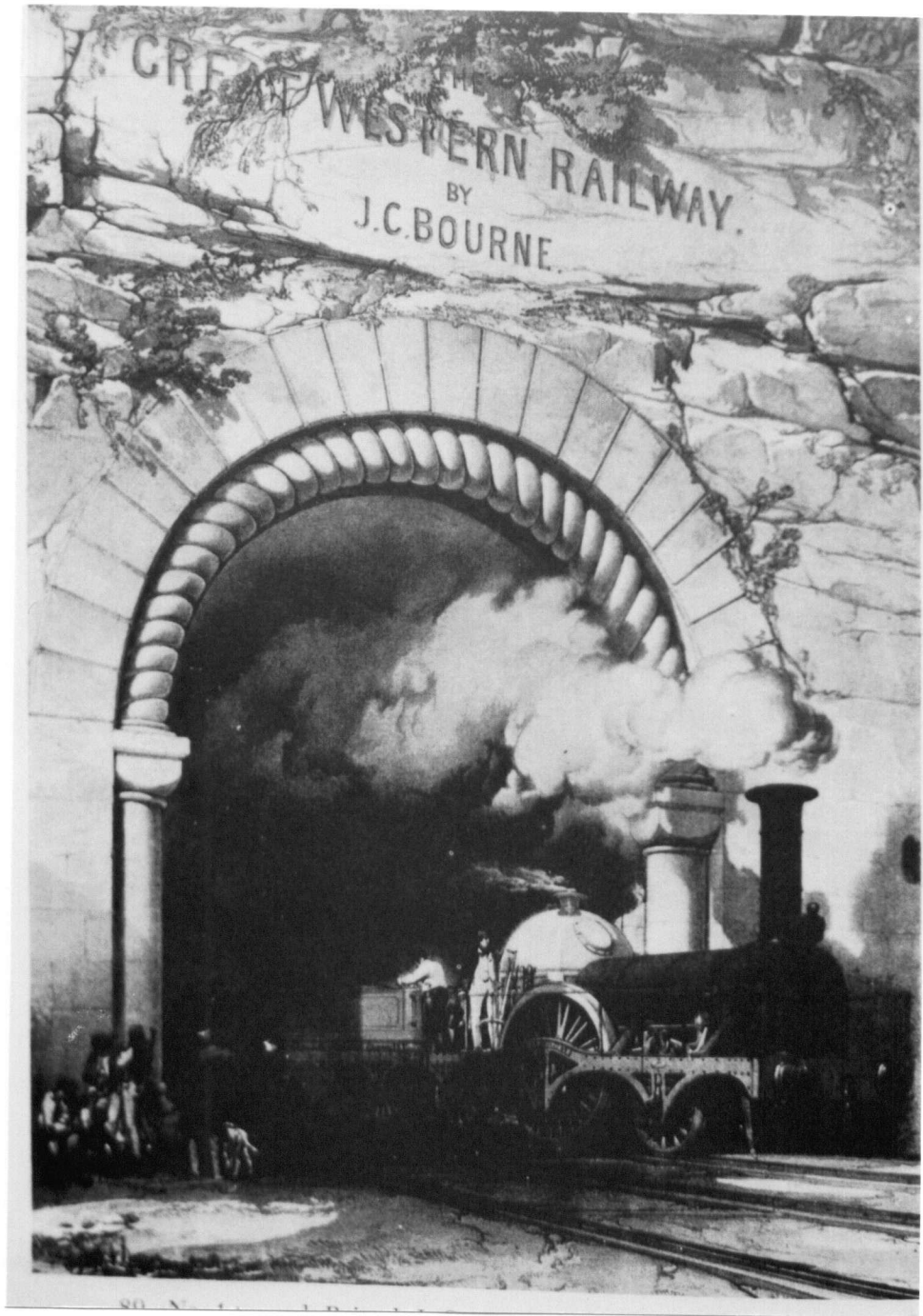


Figure 32. J.C. Bourne, #1 TUNNEL, BRISTOL, GREAT WESTERN RAILWAY, Lithograph.
From F. Klingender, Art and the Industrial Revolution, Figure 89.
Original from J.C. Bourne, History and Description of the Great Western Railway, 1846.

1.3 There is a binary level of meaning in the Bourne print Wharnecliffe Viaduct which shows classical Romanesque architecture, (supported by the naming of the edifice after the Earl of Wharnecliffe), imposed on an English summer landscape with cows chewing the cud. (Fig. 33) Apparently contented farmers are seen stacking and moving hay homewards by horse and cart, in rural harmony. Yet there is no sign of the smoke ejecting locomotive anywhere, and if this print is promoting the railway era through the auspices of the G.W.R. then it is showing a static approach to a philosophy of engineered mobility.

What is seen is almost a Picturesque print reminiscent of Turner's Crossing the Brook.¹¹⁸ (Fig. 34) Bourne shows the viaduct from underneath with no locomotive, rails, signals or trespassing signs, and thus the viaduct is promoted as a classical ruin. The Picturesque aesthetic is invoked by the contented cows oblivious to the farm laborers in the distance and foliage added to the foreground. The print strongly reflects implementations of a drive to convert potential supporters to the social advantages of railway use by propaganda through pictorial means. It offers an unilateral answer which the G.W.R. and its supporters wish to convey in that there is no loss of topographical beauty, nor loss of social and economic benefits by the incursion of their railway, the G.W.R. Of course not everyone including the Duke of Rutland believed this. He said that he did not mind the railway going to Bakewell but what he did object to was it passing near his country seat Haddon Hall.¹¹⁹ Journalist Clive

¹¹⁸ Wilton, A. J.M.W. Turner, 1979, Fig. 1125 and p.126.
Meyer, L. Masters of English Landscape, 1995, p.103. Meyer isolates this painting as being a truly English landscape scene.

¹¹⁹ Robbins, M. In the Newcomen Society. 1984-5.



Figure 33. J.C. Bourne, THE WHARNECLIFFE VIADUCT, GREAT WESTERN RAILWAY, Lithograph. From F. Klingender, Art and the Industrial Revolution. Figure 92. Original from History and Description of the Great Western Railway, 1846. Figure 24.



Figure 34. J.M.W. Turner, *CROSSING THE BROOK*, 1815, oil on canvas.
Lawre Meyer, *Masters of English Landscape*, 1995, p. 103,
Original in the Tate Gallery, London.

Aslet covers this aspect in a recent article when he discusses the difficulty of imagining England's patchwork fields, valleys and rolling hills as "...a place of conflict."¹²⁰ Yet the duke must have envisioned such conflict when he declared that any railway built near his property must be out of sight of his view. If building a web of railways can be considered in the same context of mapping sailing routes, then a new meaning can be applied to nature and how it is represented in print. By systemizing nature like the railway companies did in the mid-19th Century, a link can be made to Mary Louise Pratt's reading of the early circumnavigators in space and prints which "...was to assert even more powerfully the authority of the print and thus the class which controlled it."¹²¹ Allowing for the fact that control over prints had become more widespread by the time the railways were being built, it was nevertheless still in the hands of the few who controlled distribution and thus reception. Both of these can be directly translated into Bourne's topographical work conveying the railway advocates view of social progress through engineering art solely for the G.W.R.

¹²⁰ Aslet, Century "The cry of rural England" in The World in 1998, 1998, p.51. Directed to access to land and land ownership.

¹²¹ Pratt, M.L., Imperial Eyes: Travel writing and Transcultivation, 1992, p.30.

THE ENGINEER: HIS WORKS AND SOCIETY

2. Photography

2.1 THE GREAT EASTERN

As chief engineer of the Great Western Railway I.K. Brunel was responsible for locomotive designs and when he turned his attention to ships he was also the mechanical in charge of their overall conception. The 1851 photograph by Robert Howlett of the Great Eastern, the biggest ship ever to be built up that time, was as far ahead as a marvel of iron used in shipbuilding and steam application in propulsion, as was photography for quickly recording those engineering feats. (Fig. 35). Both the magnitude of the project itself, with all the equipment lying around, and the contrast between the top hatted Brunel and the upper deck of the ship, appears to dwarf the engineer alongside his brainchild. Photographs of engineering projects such as the Great Eastern with the inclusion of the engineer appear to confirm that 'man is the measure of all things' but are in conflict with individual portraits which emphasize the isolation of the engineer.¹²²

External isolation can be ascertained by graphic representation of the engineer on pedestal or red velvet chair, but the internal isolation of decision making and social

¹²² Fram, J. (Ed.), "Art through the camera's eye", in Robert Smithson: The Collected Writings, 1996, p.37.

I.L.N. October, 1854. p.440. Report that the biggest iron ship could be used as a troop ship. This comment opens the door to a later discussion on the impact of naval engineering on imperial expansion and the role of the engineer in this area.

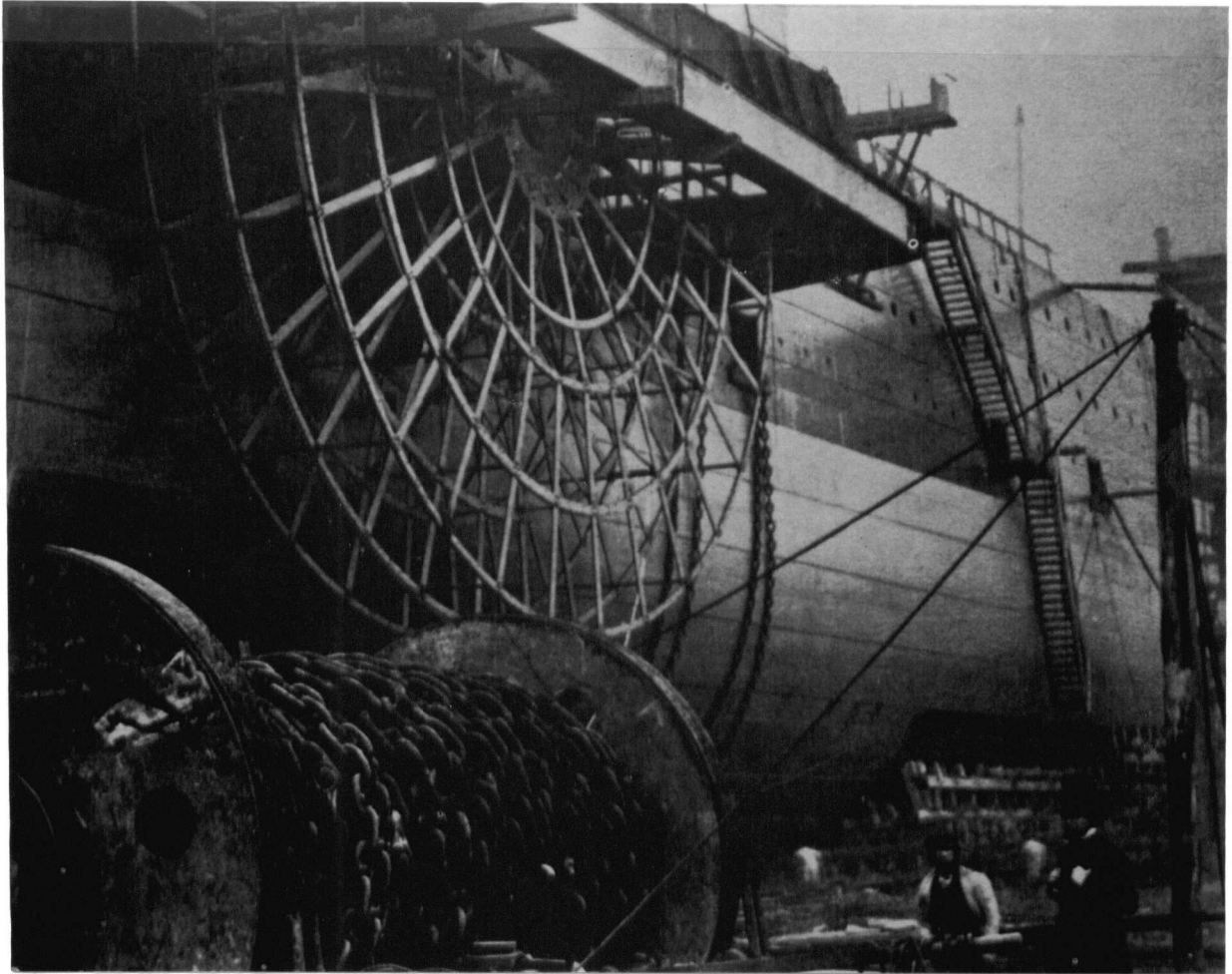


Figure 35. Robert Howlett, THE 'GREAT EASTERN' ON HER LAUNCHING CRADLES, Photograph, Circa 1857. Francis Klingender, Art and the Industrial Revolution, 1968, Fig. 98. Original; The Institution of Mechanical Engineers.

responsibility is difficult to portray. Brunel alongside his great ship is like the 'chains' photograph, part of a larger engineering picture, but as an engineer responsible for delays over expenditures or accidents, he becomes very isolated even if he was not directly responsible.

However farsighted Brunel was, he was also in many ways isolated from his compatriots. Writing on the life of John Scott Russell, Brunel's naval architect, Henry Petroski offers one reason: namely his feuding with Russell.¹²³ It was no accident that upon turning his attention to ships, Brunel transferred his vision of greatness from the wide gauge of his beloved G.W.R. and named his ships also great - Great Western, Great Britain and Great Eastern. Visionaries always look beyond the mundane and no doubt Brunel's schooling gave him the comparative idea of telling the world that Britain and its engineering technology were the best. Furthermore the use of the title Great Britain was an epitome of imperialism on at least two levels, both that his ship was majestic in form, performance and power and also that Britain ruled the seas, literally and imperially. There is a monumentality to the photograph of the Great Eastern towering above the engineer and his workers to support this idea.

Photography was more amenable to the new reality of industry by its speed of execution compared to lithographs, drawing or paintings and by its mobility and availability on any site in the time it takes the photographer to get there, the click of a shutter could immediately record the moment for posterity. It is to Brunel's credit and farsightedness that he used the medium to record pictorially the new difference between wide landscape representation in the older traditional methods of painting and a chosen limited field of vision with a concentrated

¹²³ Petroski, H. "John Scott Russell" in American Scientist, Jan./Feb. 1998, p.18.

viewpoint but with lots of detail.¹²⁴ In fact Howlett must have delighted in the excess of equipment and range of smaller articles lying around which were normally not so evident. Starl addresses this when he talks about photography's binary actuality "of the image and the observation."¹²⁵ What is observed, what is produced and what is seen.

From the changes taking place in shipbuilding during the 19th Century, and the mammoth size of both the Great Eastern and all its component parts, it is obvious that Brunel could not carry out the construction of such a vessel without Russell's input. Engineers were not always necessarily in agreement for any particular situation so it becomes possible to understand Brunel's frustration towards problems of ship construction and his differences with Russell.¹²⁶ Henry Petroski's summation that "Engineering spans the spectrum of creative problem solving from concept to construction" places Brunel's position as the primary one since he was the originator of the concept, but during the building of the Great Eastern questions arose about manufacturing a shaft weighing 30 tons.¹²⁷ It behove engineer William Johnson, Civil Engineer, to inform the public of the difficulties forging such an enormous piece of wrought iron by writing a letter to the press explaining the problem.¹²⁸ It is to Johnson's credit that he was strong enough in his convictions, to write to the press as a public

¹²⁴ Bindman, D. (Ed), Encyclopedia of British Art, 1985, p.142.
 "Landscape painters (excluding Turner) rarely confronted the physical effects of industrialization."

¹²⁵ Starl, T. "Fortschritt und Phantasma" in Silber und Salz, 1989, p.80.

¹²⁶ Petroski, H., 1998, p.19.

¹²⁷ Ibid, p.19

¹²⁸ I.L.N., January, 8, 1859, p.37

acclamation of an individual engineer's opinion. This incident indicates a multi-purpose role for the engineer of the period by the informing of non-participants as well as the directing of engineering projects. It is difficult to fully realize the huge composite task of building a ship of the magnitude of the Great Eastern and the posturing of the relatively small figures supports the contention that not only was its size enormous but that it was at the cutting edge of shipbuilding knowledge and that the personnel were aware of this fact. As such, the photograph by Howlett of Brunel alongside his great ship helped establish Brunel's position as an engineering giant.

THE CIVIL ENGINEER: HIS WORKS AND SOCIETY

3. Oils

The dearth of portraits of engineers is found in the relatively few academic High-Art pictures identifying engineering works. In one known case there is a multiplicity of photographs of Brunel taken by Howlett on the same day near the Great Eastern.¹²⁹ However because of the new subject 'engineering' which was encroaching daily into the English social as well as economic life, there appears to be some difficulty in differentiating between engineering works and the occasion of the works.(Fig.36) Popular press illustrations tended to show the pageantry of such things as railway openings by the Queen rather than the railway and its engineer.¹³⁰(Fig.37) Nevertheless there are a small number of academic and Pre-Raphaelite Art paintings dealing with engineering and industrialization. Unfortunately the patrons of these works had their own agendas (which are so often not open to interpretation by art historians who often define what they consider are the artist's intentions as being the subject matter of the painting, rather than the painting's content.)

3.1 Work

Ford Madox Brown who exhibited Work at the Royal Academy in 1852 was an associate of the Pre-Raphaelites. This group was one of many critical voices in the new industrial era, which were starting to be heard. Brown's major theme in Work is the place of

¹²⁹ Petroski, H., 1998, p.20.

¹³⁰ LLN, July 16, 1859, p.66. Opening the Tavistock Railway.
LLN, March 12, 1859, p.260. Opening of new waterworks.
LLN, May 14, 1859, p.476. Inauguration of the Albert Viaduct.

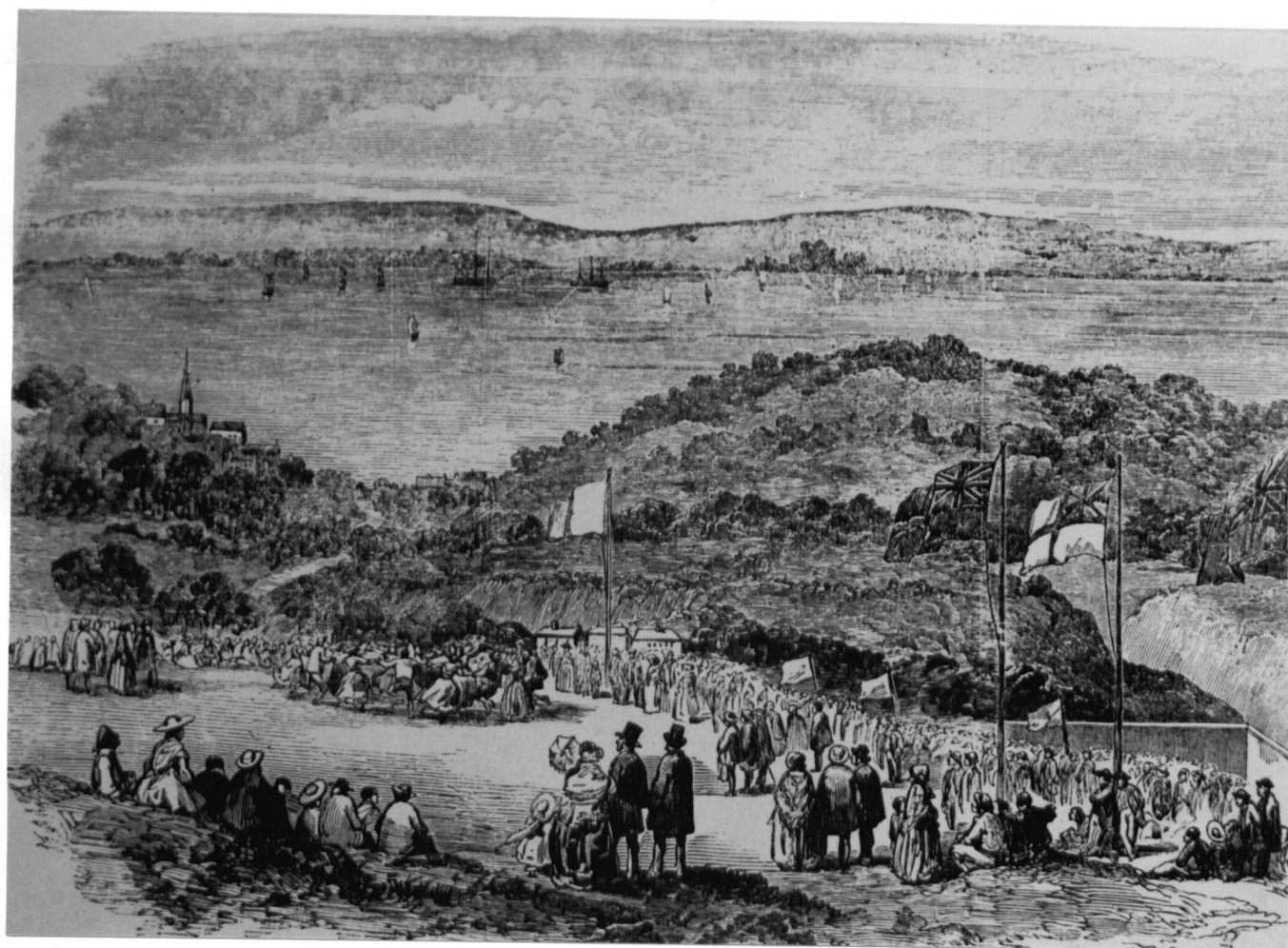


Figure 36. INAUGURATION OF THE WATERWORKS AT RYDE.
Lithograph, L.L.N., July 7, 1855, p.4.

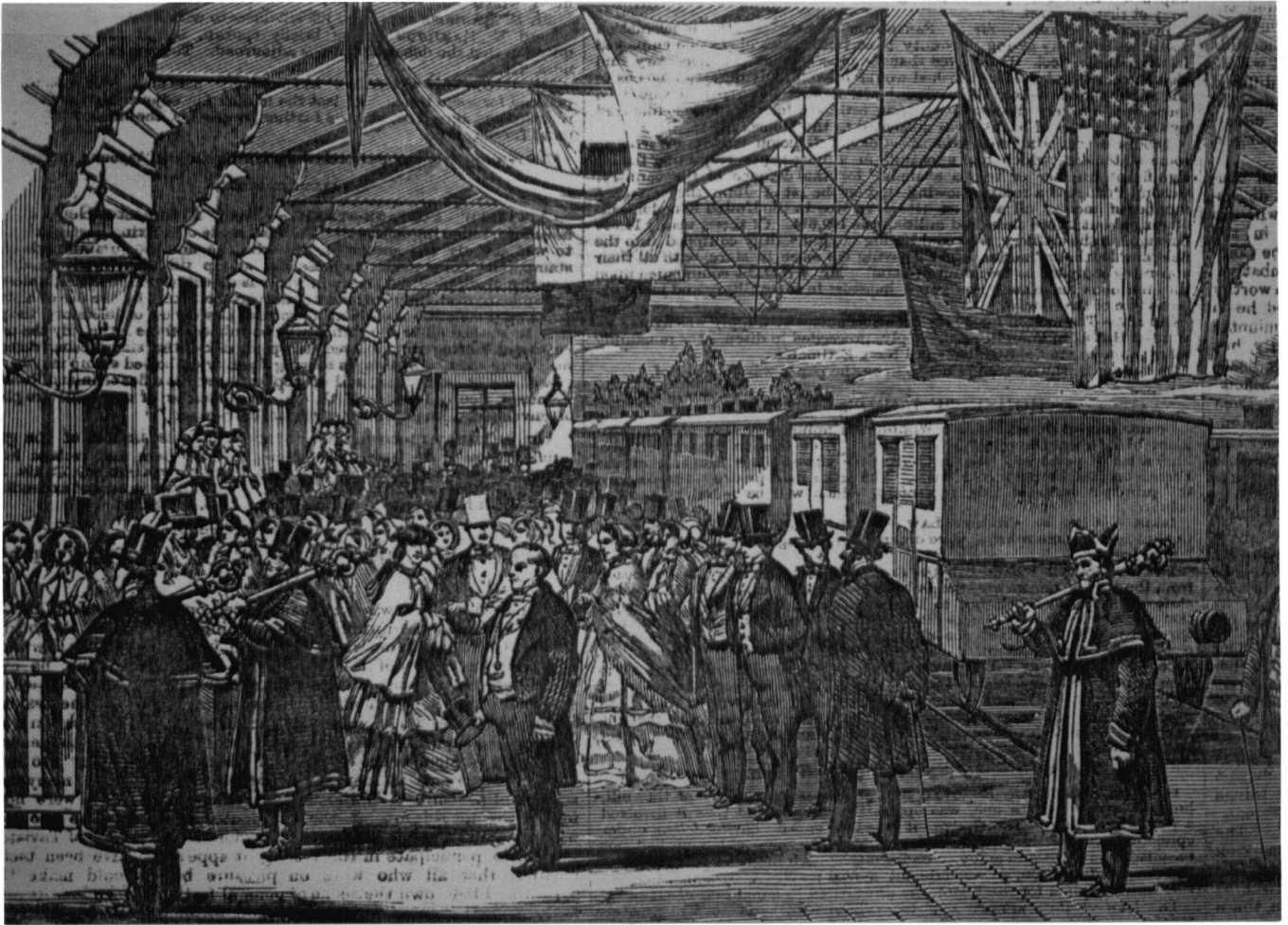


Figure 37. OPENING THE DEVON AND TAVISTOCK RAILWAY.
ILL.N., July 16, 1859, p.66

labor in contemporary society but it illustrates manual labor rather than industrial, technological or engineering development. (Fig.38) The small number of items that can be discerned as objects manufactured industrially, essentially upgrade traditional utensils. The barrow wheel of cast iron replaces a wooden wheel with wrought iron tire, the bucket of sheet iron replaces a leather one and the hod carrier's flask is made of tinned sheet while the block appears to be of Marc Brunel design. The single most important item referring directly to industrialization is the town-gas lantern bracket on the wall, first developed in 1812. There is no evidence of the hot dirty hard labor and danger to which workers were subjected to produce the iron products.¹³¹

What is open to the 'gaze' is the socio-political issue of exploitation and development, alluded to by the presence of richly dressed observers, the contractors, the Metropolitan Board of Works and the barefooted homeless poor. Yet Brown does not comment clearly on the industrial revolution or industrialization as some writers have contended.¹³² Certainly there is a reference to large families, poverty and overcrowding together with riches, idleness, good living and physical labor. No person appears to have anything to do with industry, unless they own some stocks and shares in industry as evidence is minimal. Nor does the smile on the face of the barefooted girl tell a story of the 1000 people per day, supervised by the constable, lining up at the soup kitchen with their bowls in an effort to prevent starvation in the materially

¹³¹ I.L.N., April 28, 1865, Workers in a rolling mill.
I.L.N., February 22, 1862, p.183, Pouring molten metal to form a casting.
I.L.N., January 7, 1860, p.12, Casting a large steel bell.
I.L.N., September 14, 1861, p.274, Rolling steel plates.

¹³² Bell, M. And Bryson, N., The Art Bulletin, June 1991, p.178, Discussion on "chronological reversal."



Figure 38. Ford Madox Brown, *WORK*, 1852-65, oil on canvas, from Timothy Hilton, *The Pre-Raphaelites*, 1991, p.156.
Original in City Art Galleries, Manchester.

richest city in Europe.¹³³ (Fig.39) What about their status and social conditions? One wonders about the availability of soap, its methods of manufacture, price and distribution; weather conditions and if they had both summer and winter clothing, or if the girl and her family had shoes. We see no evidence of the incidence of boils, sores or rashes brought about through unbalanced diets, the effect of locally contaminated shellfish, insufficiently cleaned copper cooking utensils or too much fat in the food.

Julius Bryant in reviewing Brown's English Afternoon Revisited, describes Work as a political allegory on human labor and one can agree that there is equally as much hidden in this painting as well as the labor of lining up for daily soup.¹³⁴ (Fig.40) He makes no comment on the subject matter although he does mention the social issue of land misuse which is arguably applicable to this scenario. Some might have said that building coal consuming houses on this site was land misuse, polluting the countryside with black smoke, yet the painting shows no vestige of smoke in the clear sky. Its absence creates a void which registers a dislocation from the industrialization to which the painting is often associated.¹³⁵

If Work be regarded as one of the 'best' paintings and the 'public' as that

¹³³ LLN., Nov.. 22, 1862, P.561. Two illustrations show lines of poorly dressed people awaiting food at the MASE soup kitchen. Adjacent in contrast is an illustration of the richly clad ladies of the central Relief Committee meeting in the Manchester City Mayor's parlor. LLN., August 20, 1853, p.125. Note on working class food: wages ratios. Punch, January 22, 1859, p.35.

¹³⁴ Bryant, J., "Madox Brown's England Afternoon revisited: Pre-Raphaelitism and the environment" in Apollo, Volume 146, July 1997, p.41.

¹³⁵ Fram, J. (Ed.), "Some void thoughts on museums" in Robert Smithson: The Collected Writings, 1996, p.41
Foucault, M., The Archaeology of Knowledge, N.Y.: Harper & Row, 1972, p.25.



Figure 39. THE MASE SOUP KITCHEN., I.L.N., Nov.. 22, 1862, p.561



Figure 40. Ford Madox Brown, *AN ENGLISH AUTUMN AFTERNOON*, Hampstead, 1853, oil on canvas. From Laure Meyer, *Masters of English Landscape*, 1995, p.178. Original in Birmingham City Museum and Art Gallery.

described by Smiles, then Michael Baxendall sums up Madox Brown's Work succinctly when he avers that, "The best paintings often express their culture not just directly but complementarily, because it is by complimenting it that they are best designed to serve public needs."¹³⁶

3.2 Iron and Coal

A mural supposedly illustrating industrial development specifically of Newcastle on Tyne, is William Bell Scott's Iron and Coal, where the labor of idealized male workers is contrasted with leisured femininity. (Fig.41) It is highly unlikely that Scott would have seen a young woman, hatted and expensively dressed, sitting apparently unconcerned, along with unopened lunch box and a book, within an arm's reach of two workers swinging 28 pound sledgehammers.¹³⁷ Hot scale from the impact of the hammers would have been flying in all directions reflecting on the unsafeness of the location. A nearby block and tackle which oscillate when loaded would have been another hazard. The young woman appears oblivious to the toiling workers and the fact that she is seated a few paces from the unguarded edge of the deck which is two stories above the ground. We do not know who sent her or why, if anyone assisted her onto the deck, or if anyone was conscious of her presence.

Without a doubt, Scott was trying to accommodate the drastic change in human terms which engineering brought into the social scene within earlier pictorial conventions, a good

¹³⁶ Baxendall, M., Painting and Experience in Fifteenth Century Italy, 1972, p.48

¹³⁷ Bermingham, A., "The Picturesque and ready to wear femininity" in The Politics of the Picturesque, 1994, p.106. "...at the beginning of the 19th Century, the female body was increasingly made the site of cultural struggle."

Piper, D. 1992. p.221, argues that the painting contains little to associate it with an industrial meaning.

example being the works of Wright of Derby such as The Forge.¹³⁸ (Fig. 42)

Newcastle in 1861 was a bustling shipbuilding and coal port, as is evident in Scott's painting. What is latent is Newcastle as the thriving political center of northern England, rebuilt as a neoclassical city by Richard Grainger and reputedly A.N.W. Pugin the gothic revivalist. Certainly, the railway connection is present by the 1849 Robert Stephenson bridge, but the industrial association goes back to his father (George) building an ironworks there in 1823. No doubt, Scott was "normalizing" the industrial revolution within the painting by representing Britain as a powerhouse of engineering technology and imperial power as he understood them. This is not to say that he was wrong as the painting contains all the elements pertaining to its title Iron and Coal. The ladle of molten iron, engineering drawings of Stephenson's 2.4.0. locomotive, a complex figure wearing seaman's jacket and sea boots but carrying a 'Geordie' miners lamp tell one story. Another factor is that while to top hatted gentlemen ignore the toque headed loafer and shawl wearing woman, extremes of the social scale are presented to the viewer, upper and lower respectively. Among all these people the well dressed young woman with her hand baggage, seated on a ship's spar poses a problem. Explanations can be furnished for her presence, but in this case she must be symbolic to the affluence of Newcastle, showing that females although literate, played a secondary but supporting role to the male activity of this northern locale.¹³⁹

¹³⁸ Meyers, L., Masters of English Landscape, 1995, p.71. The single woman is surrounded by idle spectators in a nocturnal scene romanticized by the double light of moon and furnace.

¹³⁹ Scott, J.W. Gender and the Politics of History, 1988, p.19. Outlines the position of women in similar situations.

As an allegory of northern industry pivotal upon Newcastle, Iron and Coal shows a continuing high level of manual labor in the industrial revolution but greatly exaggerates the quality of working conditions and undermines the quantitateness of the engineering input.

3.3 Rain, Steam and Speed: The Great Western Railway

The illustration by Scott of Stephenson's Newcastle High Level Bridge of 1849 relates indirectly to J.M.W. Turner's Rain, Steam and Speed: The Great Western Railway (subsequently referred to as RSS/GWR). (Fig.43) Turner however, presents his locomotive on the Maidenhead railway bridge as seen from an aerial vantage point and his picture is in a more topographical vein, remarkable for effect of atmosphere and light which appear to have the quality of watercolors and the consistency of oils. According to John Gage the painting is seen as "...a celebration of rail travel" as well as the destruction of the landscape.¹⁴⁰ But it is best regarded as part of a group of large works by Turner depicting steam propulsion.¹⁴¹

McCoubrey supporting Monkhouses's earlier position (1878), offers a deeper meaning to the work that R.S.S./G.W.R. is the "...modern myth about change itself, change wrought in the elements of steam and speed, change in technology, change worked in the landscape and change in the very conception of time and space"¹⁴² His interpretation of the railway spoiling

¹⁴⁰ McCoubrey, J. "Times' Railway: Turner and the Great Western" in Turner Studies, Vol.6, No.1, 1986, p.33

¹⁴¹ Wilton, A. J.M.W. Turner, 1979. There are dispersed a whole number of 91x122 cms. oil paintings depicting different types of ships 'under steam.'

¹⁴² McCoubrey, J., 1986, p.38



Figure 41. William Bell Scott. IRON AND COAL, 1861.
Francis Klingender, Art and the Industrial Revolution, 1968, Fig. 112,
Original: Mural at Wallington Hall, Northumberland, The National Trust.



Figure 42. Joseph Wright of Derby, *THE IRON FORGE VIEWED FROM WITHOUT*, 1773, oil on canvas.

Laure Meyer, *Masters of English Landscape*, 1995, p.71.

Original: Hermitage Museum, St. Petersburg.

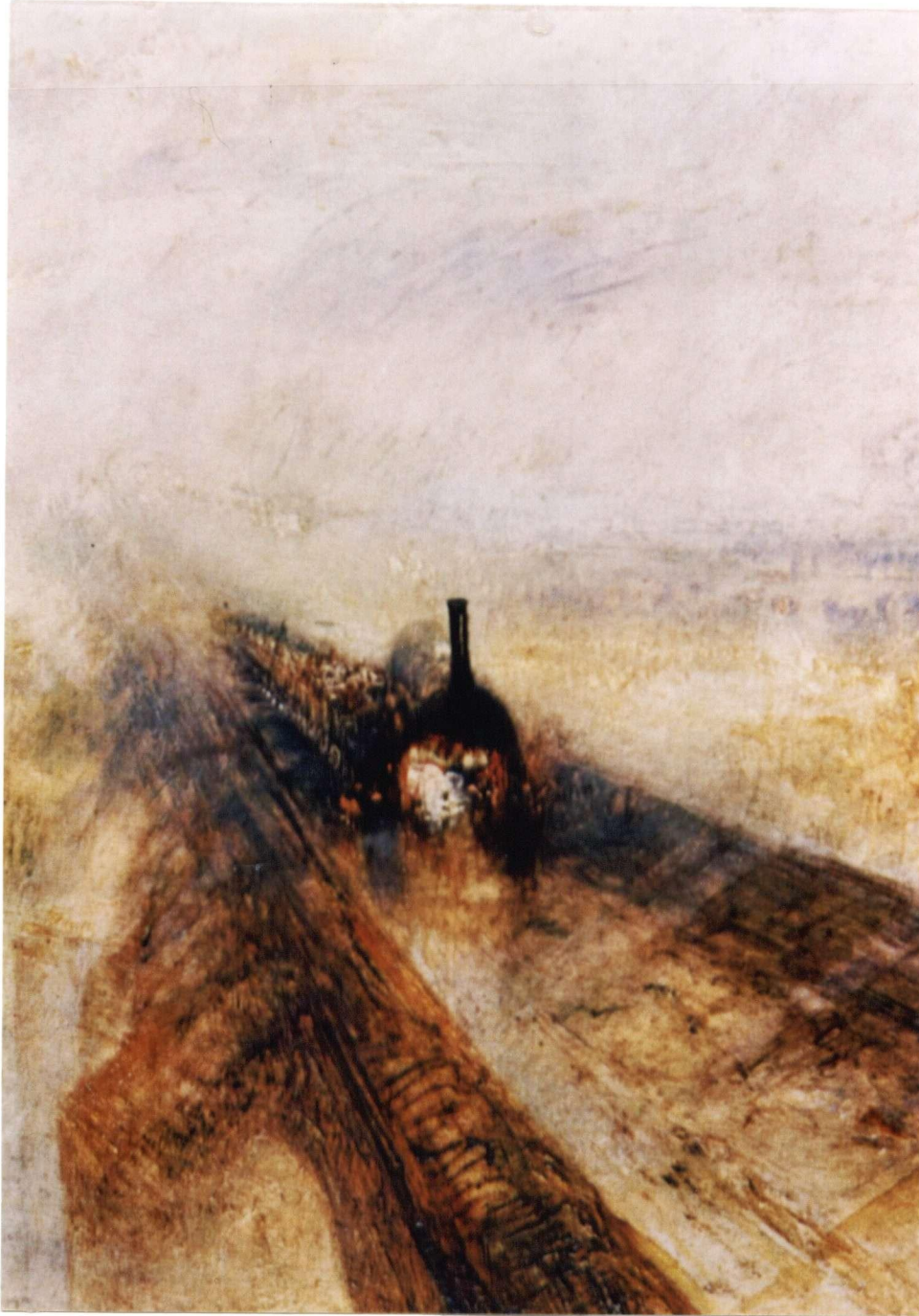


Figure 43. J.M.W. Turner, RAIN, STEAM AND SPEED: THE GREAT WESTERN RAILWAY, R.A., 1844, (B.J. 409), oil on canvas, 91X122 cms., from Andrew Wilton, J.M.W. Turner, 1973, p.217.
Original from The National Gallery, London.

the beauty of the Thames Valley and choice of words is very ambiguous even as he refers to the conflicts between industrial and pastoral landscapes. Both Gage and McCoubrey present arguments that are in line with certain art historical schools which concentrate on analysis of the artist's intention. This can lead to a problematic premise of what the painting is really saying. This study on the other hand, asserts that the new, relatively fast moving locomotives were such a novel conception that they did not fit easily into established traditional topographical landscapes. Bal and Bryson proposed they were possibly "...kinds of historical objects that do not readily lend themselves to pictorial representation."¹⁴³

In his work on Turner, his cataloguer Andrew Wilton obliquely appears to support Bal and Bryson when he compares the painting R.S.S./G.W.R. to "...a subject of the ancient gods and heroes."¹⁴⁴ However, he does not offer a symbolic meaning for his statement, only a flight of fancy which is a misleading interpretation. Nowhere in this work is there any reflection of the mythological and historical subject matter which can be seen in Turner's other works such as Ulysses, Europa, Dido, Deluge and Hero & Leander. He further comments "The steam of railway locomotives was a new ingredient in the atmosphere that Turner loved to render" and concluded that the painting is "...self explanatory" raising questions which require answering.¹⁴⁵ There is no evidence whatsoever in Wilton's catalogue of Turner paintings of a steam emitting locomotive. If the painting is self explanatory it defies logic that there are so

¹⁴³ Bal, M. and Bryson, N. "Semiotics and Art History" in The Arts Bulletin, Vol. LXXIII, No.2, June 1991, p.178.

¹⁴⁴ Wilton, A. J.M.W. Turner, 1979, p.220.

¹⁴⁵ Ibid, p.220.

many opinions about it. In searching for whether or not R.S.S./G.W.R. supports industrialization it must be deconstructed one stage further. There is a mechanical-thermodynamic dislocation in this painting, completely ignored by Gage, McCoubrey and Wilton. (Fig.44) For the painting to be a true reflection of the industrial age, Turner should have included steam and smoke coming out of the locomotive chimney.¹⁴⁶ Yet the locomotive is inferred to as being mobile in both the painting and the caption. Steam and smoke are an integral part of locomotion much more apparent in the later depictions of railways.(Fig.45) For example, Monet's painting of railway stations, while representing the larger social scene, indicate the considerable impact of industrial technology.¹⁴⁷ By referring to the G.W.R. in his title, Turner individualizes the G.W.R. alluding to its greatness as the longest line, along with its uniqueness in being the only railway in Britain built by the engineer I.K.Brunel on the broad gauge. Certainly it is difficult to assert categorically that R.S.S./G.W.R. was a celebration of railways or of travel. Painting content and title subvert it to a secondary role of comparison of traveling by one railway rather than another which the working poor on their "penny days" would gladly acknowledge. While, this particular painting may have a hidden agenda on the

¹⁴⁶ Rodner, W.S., "Turner and steamboats on the Seine" in Turner Studies, Vol.7, No.2, Winter 1987, p.40.

Meyer, L. Masters of English Landscape, 1995, p.95, Snowstorm: Steamboat in Harbour Mouth, 1842, p.115.

Staffa, Fingals Cave, 1832, All these show Turner oil paintings of smoke and steam emitting vessels.

¹⁴⁷ The Art Institute of Chicago: The Essential Guide, 1993, p.155.

"Arrival of the Normandy Train, St. Lazare Station, 1877,
Director's Choice: Selected Acquisitions, 1973-1986, p.37.

'The Gare St. Lazare', 1871,

Ellis, H. Railways, 1976, P.241, "Le pont du l'Europe, Gare St. Lazare."

despoliation of the Thames Valley, it certainly does not celebrate the glorification of industrialization.¹⁴⁸

With portraits, prints and oil paintings illustrating the engineer and his works in a positive manner, it would be amiss of this investigator to neglect a look at the negative side of the engineers' impact on mid 19th Century life. There have been numerous investigations into train crashes and as the I.L.N. almost weekly commented on boiler accidents these latter are dealt with as a separate print examination in Chapter V.

¹⁴⁸ I.L.N., 1850, Book 2, p.237, Railway Excursions.

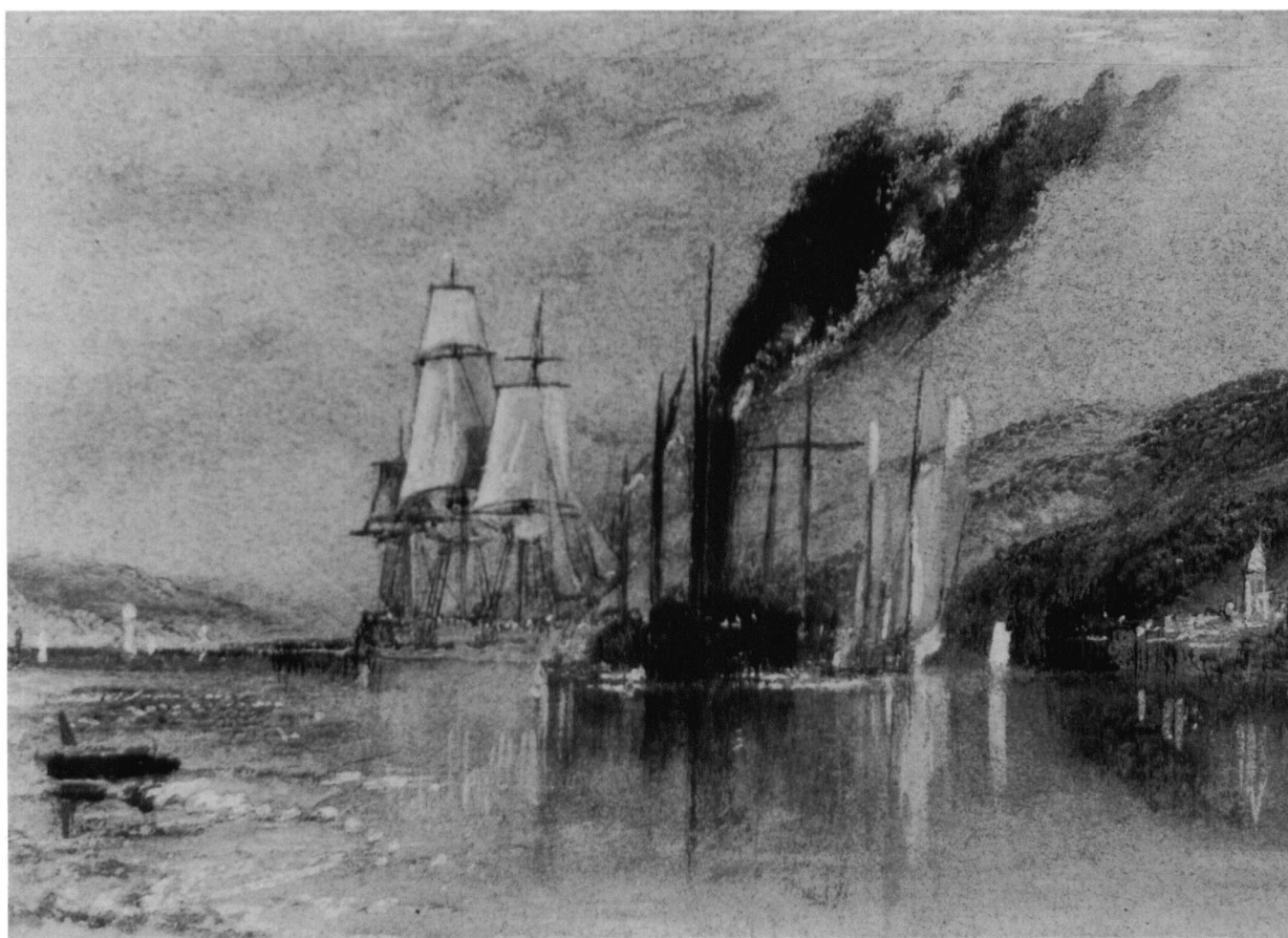


Figure 44. J.M.W. Turner, BETWEEN QUILLE BOEUF and VILLEQUIER, 1832, watercolor, 13.8X19 cms., T.B. CCLIX-104 in Turner Studies, Vol. 7, No.7, p.37, Original in Clore Gallery for the Turner Collection, London.



Figure 45. Claude Monet, THE GARE ST. LAZARE (6479), oil on canvas, 1871. Director's Choice, The National Gallery, London, 1986, Fig.34, p.37. Original: National Gallery.

CHAPTER V

THE CIVIL ENGINEER: SOME NEGATIVE ASPECTS

Prints

INDUSTRIAL ACCIDENTS

As a contrast to the ever popular romantic landscapes shown at the Royal Academy in the decades immediately before and after the Great Exhibition of 1851, the popular press published illustrations of the transformation of the countryside by railway accidents, boiler and mine explosions and similar industrial catastrophies. This was a new field of imagery which was different from academic depiction of natural or ancient catastrophies, inhumane land and sea battles, or individual scenes of physical violence. Turner's rendering of avalanches and ships in distress were some of the natural situations which pointed to loss of life but the charge of the Royal Scots Greys was a military catastrophe which Lady Butler romanticized to express xenophobic nationalism disproportionally to the actual military significance of the incident or indeed to the number of cavalrymen killed.¹⁴⁹(Fig.46) In like manner, the popular monochromatic prints of industrial accidents tend not to convey human tragedy; although they attempt to show it. Generally, the impact of destructive desolation is missing, being instead implied, which offers itself as a binary opposition. By presenting the image to the viewer as a positive subject, its negative side is not perceived as a representation of destruction. Bourne's prints, which were for a different area of consumption contain appealing views of man-made topography, which is in contrast to these industrial accident scenes.

¹⁴⁹ Encyclopedia Britanica, 14th Edition, p.949, Balaclava.



Figure 46. Lady Elizabeth Butler, *THE CHARGE OF THE ROYAL SCOTS GREYS*, oil on canvas, 1881.

John Sunderland, *Painters in Britain, 1525-1975*, New York, N.Y. Press, 1976, Fig.169, Original: Leeds City Art Gallery.

Starl covers this point in a similar way to Helsinger when he discusses image ownership.¹⁵⁰ "In their gallery of images, the universe could be governed according to the imagination of the owner." But because of the technical difficulty of transferring the photographs directly onto the tabloid, the deposed image of the copied print lost some of its objectivity. Incongruous as this may seem, Oettermann informs us that some of the earlier photographers would "...rather trust his own drawing pen." for reproducing nature than use the camera lens so that the metaphysical size of the universe was governed by the image maker.¹⁵¹ Popular press prints of accidents have like Bourne's G.W.R. prints, a commonality in their portrayal of the human element as static but non-distressed. Figures, often lone females appear to be standing in the midst of destruction, surveying the scene. Sometimes they have small children with them which directs the viewer to consider the multiple family bereavement often caused by one industrial accident, of families with no breadwinner and no insurance money but many mouths to feed.¹⁵²

Devastation and loss of life usually produce an empathetic if not sympathetic grouping of the sexes related to the catastrophe and its location. Isolated females draw attention away from the devastation and tend to focus them as spectators in the landscape.(Fig.47) This can be seen in the formulation of Scott's Iron and Coal where the aggressiveness of the hammer wielders is reduced by the placidness of the apparently stoic young woman. Bourne's prints don't offer this contrast to the viewer, being destined for a different 'gaze' such as that of the

¹⁵⁰ Starl, T. "Fortschritt und Phantasma" in Silber und Saltz, 1989, p.80.

¹⁵¹ Oettermann, S. "Johann Carl Enslen" in Silber und Salz, 1989, p.684.

¹⁵² O'Malley, P. "Risk and Responsibility" in Foucault and Political Reason, 1996, p.193.

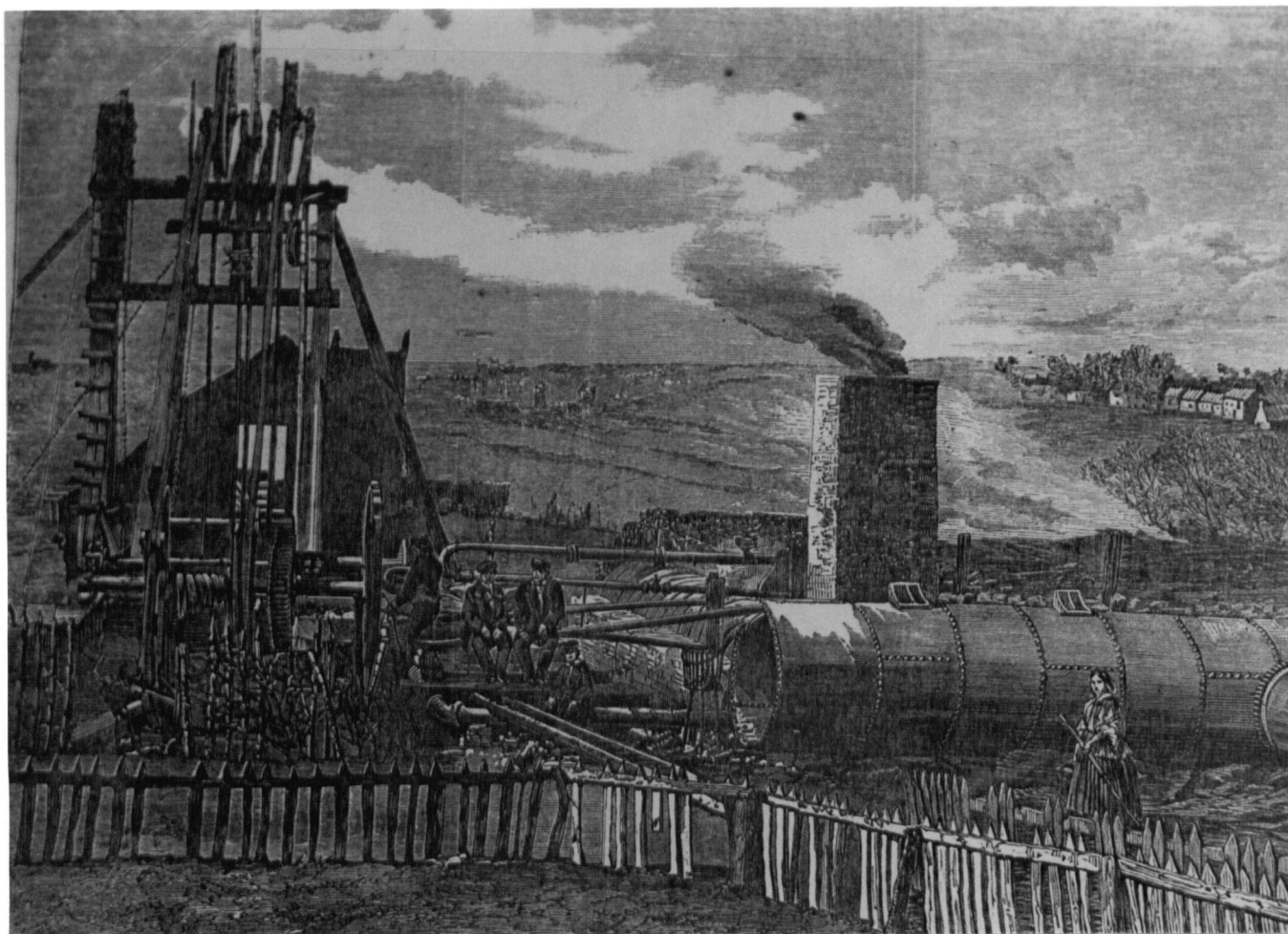


Figure 47. SCENE OF BOILER EXPLOSION, AIRDRIE, Lithograph, I.L.N., May 12, 1860, p.460.

railway enthusiast. It also follows that industrial accident sites where boiler explosions occurred on private property, would normally demand restricted public access. Onlookers and relatives would conceivably congregate at the works gate; but allowing family members onto the actual accident location belies all Harvey's arguments about use of controlled space.¹⁵³ Another aspect is the transfer of detail from photograph to print, resulting in exaggeration of the verticality of industrial remains.(Fig.48) Such alterations of the pictorial balance between horizontal components is in Robin Simon's words "...a characteristic habit of primitive painters", the lithographer has dampened the effects of reality.¹⁵⁴ The fact that engineers were not always made party to circumstances and conditons surrounding their work, may have excused them from responsibility for certain disasters. Failure to allocate responsibility is no reason to condone accidents, as well as the converse. In 1855, a cast iron bridge collaspsed into the River Avon at Bristol and subsequent investigation proved that for 50 years the bridge had successfully carried deck loads.(Fig.49) On the day of the accident, a small steamship rammed the framework of the bridge which shattered into thousands of pieces in seconds.¹⁵⁵ A popular press print of the disaster aptly showing the desolate bridge abutments illustrates the magnitude of the missing span, but the group of onlookers on the site are reminiscent of the onlookers always present at bridge openings.(Fig.50) This 'people presence' duplication is natural in times of success and failure, however in the case of calamity when close-up sorrow is missing, the image loses some of its message. Perhaps the onlookers were just inquisitive as,

¹⁵³ Harvey, D. Consciousness and the Urban Experience, 1985, p.23

¹⁵⁴ Simon, R., The Portrait in Britain and America, 1987, p.21.

¹⁵⁵ I.L.N., March 24, 1855, p.267.



Figure 48. SCENE OF BOILER EXPLOSION, PAGE BANK COLLIERY, Lithograph, I.L.N., October 16, 1858, p.351.

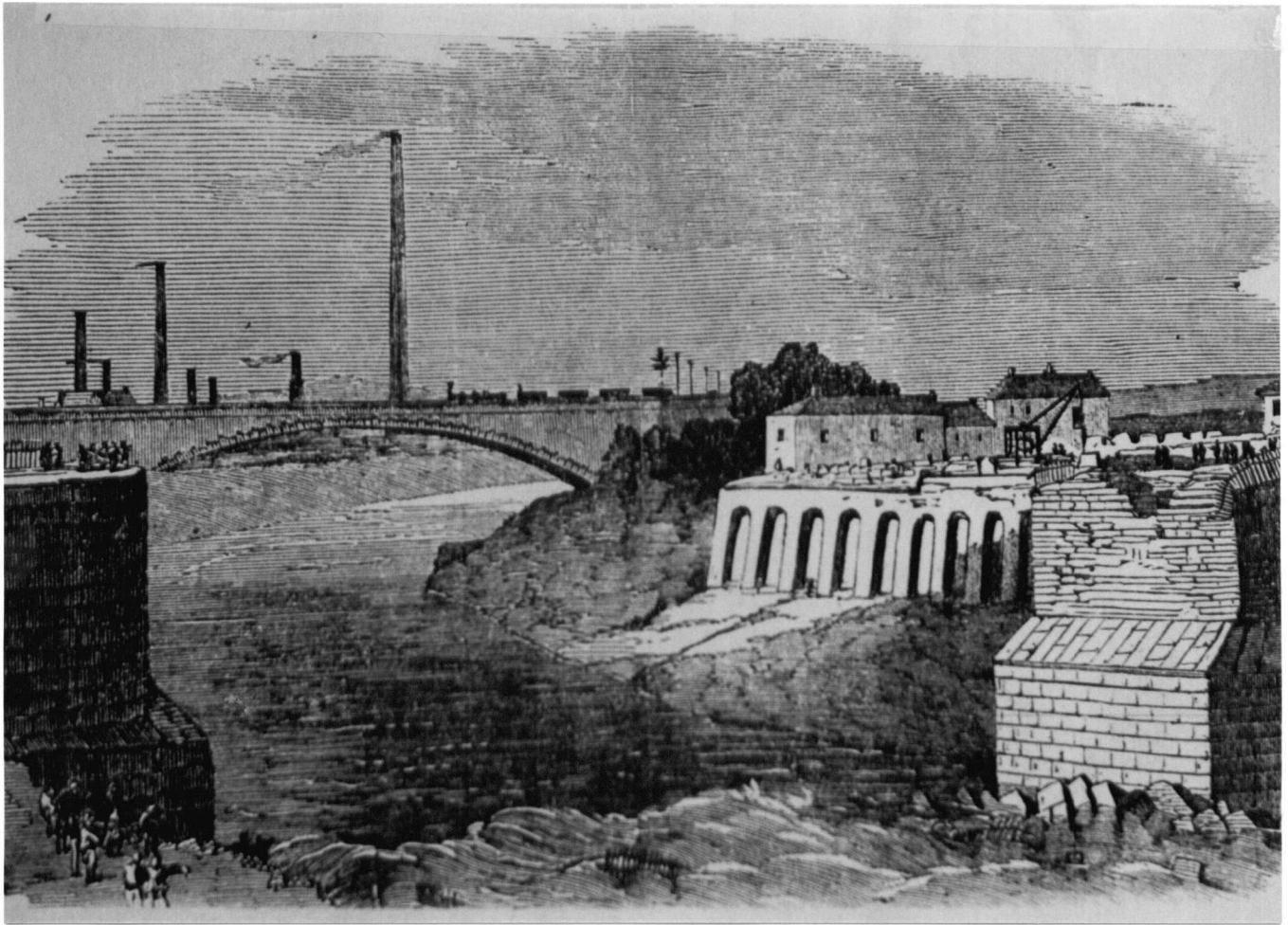


Figure 49. CATASTROPHE AT BRISTOL, Lithograph, I.L.N., March 24, 1835, p.267.

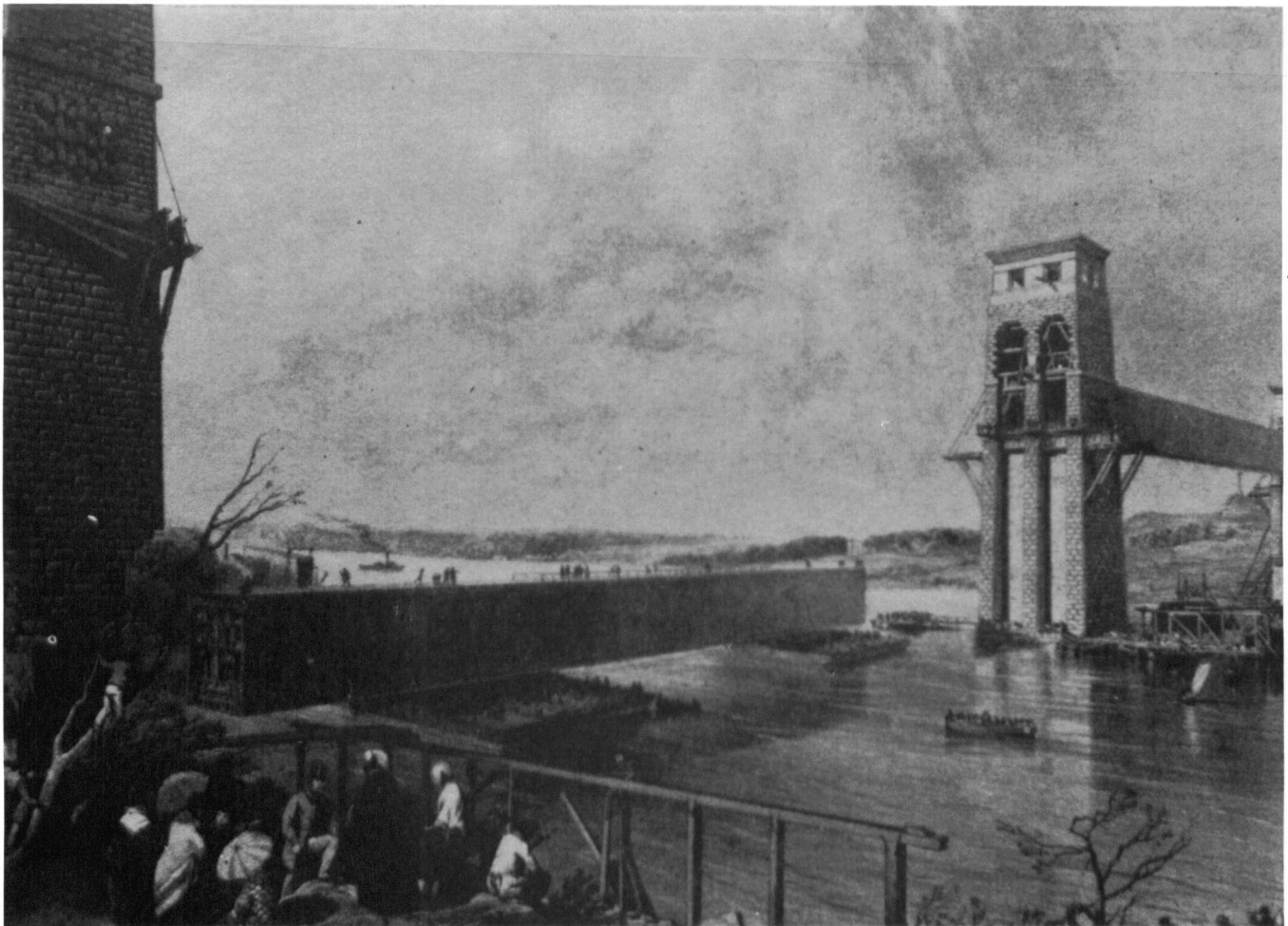


Figure 50. BRITANNIA TUBULAR BRIDGE OVER THE MENAI STRAIGHTS, 1849, from Klingender, F., *Art and the Industrial Revolution*, 1968, Fig.94. Original Lithograph by S. Russell in 1849. Arthur Elton Collection.

no doubt, would be the inspection engineer. Since the literal fracture in this scenario was that the bridge was designed and built in an age when knowledge of cast iron was in its infancy, no one could be called to account.

In order to avoid such disasters, the Institution of Civil Engineers encouraged their members to discuss latest developments and demonstrate models.¹⁵⁶ Meeting agendas included contemporary engineering problems, socio-cultural aspects of engineers and even exhibition of portraits of members.¹⁵⁷ There may have been friction, differences of opinion or downright opposition amongst institution members within the umbrella of the brotherhood, but nevertheless, the organization set out to be professional in its mandate and managed to continue to do so. The fact that it spawned other professional offshoots, all of which are still extant and thriving, says a lot for engineers of the mid-nineteenth century.¹⁵⁸ Other features in the representation of this bridge accident outline the industrial development of Bristol. The tall chimneys emitting black smoke, remind us of the long hours workers had to endure in polluted atmospheres, totally in contrast to Madox Brown's labourers in Hampstead. It appears ironical that at the instant of recording the missing iron bridge, a steam locomotive the epitome of the 19th Century, engineering should be traversing a traditionally designed stone bridge in the middle distance. This 'accident' print contains elements of industrialization and engineering

¹⁵⁶ See note 42.

¹⁵⁷ I.L.N., June 2, 1855, p.539. Paintings and sculpture together link models exhibited at Institution of Civil Engineers meeting in Great George Street.

¹⁵⁸ Encyclopaedia Britannica, Fourteenth Edition, p.463. Established in 1818 and incorporated in 1828, the Institution of Civil Engineers was the forerunner of other engineering societies, e.g. Institution of Mechanical Engineers, 1847; The Society of Engineers, 1854, Surveyors Institute, 1869.

from the previous fifty years and its message corroborates the policy of the Institution of Civil Engineers that their professional meetings were to keep them aware of the new developments which was part of their mandate.¹⁵⁹ It also emphasizes the fact that as well as industrialization being a positive factor in the mid 19th Century engineers had a responsibility to the public sphere to prevent loss of life by maintaining high standards in their practice but also in their application of that practice.

¹⁵⁹ I.L.N., August 20, 1859, in Kensington Museum in presence of Capt. Fowke.
I.L.N., July 12, 1862, p.55, Report of Annual General Meeting.

CHAPTER VI

CONCLUSION

Mid-19th Century engineers in Britain played a major role in economic and political life and their upward social mobility, as well as simultaneously established institutional networks, changed public awareness of this profession. Moreover their non-partisan contribution can be read as proof of their importance in contributing to the improvement of the cultural life in British society.

Some engineers were praised by their peers or by the aristocracy, local civic groups or townspeople and given testimonials, plaques, silver cups and marble busts. Yet they were celebrated in relatively little art work although a few had themselves portrayed in paintings, sculpture or photographs. Others have left no other visual images outside their engineering works, deeds, inventions, patents or biographies so that consigned portraits in the National Portrait Gallery are very few compared to churchmen, aristocrats, politicians or military.

The dearth of material causes problems in selection but the representational complexity of traditional pictorial material highlights the difficulty artists labored under in depicting engineering works through conventional iconography and art practices.

The artists who arguably best represented engineers and engineering from this study's analysis, were the engravers and photographers who attempted to show what was there, even if in many cases the illustrators sketched railway wagons without axles, locomotives sans wheels and rolling mills minus their drives. These omissions of a technical nature can be understood as a consequence of the difficulties of artists to comprehend ongoing complexities. Baxendall has proposed that everyone sees objects differently and that preferred skills relevant to the

perception of works of art are usually taught ones, so that the representation of new mechanical objects would not be learned until the secondary generation. Still, the illustrators were in real terms reporters of circumstances by visual images of engineer participation, in contrast the art of Bell, Bourne, Brown and Turner which was not strictly factual reporting of engineer's deeds. Rather it was an interpretation, sometimes more idealized of a circumstance and therefore had its own voice and was open to an alternate interpretation of the 'gaze'.

On another level, the gap between sketches, oil paintings and photography was finally bridged so that what appeared previously as isolated modes of pictorial representation now became interchangeable rather than new methods substituting traditional ones. Prints were replaced by photographs and photographs were used to prepare prints. Oils were used to record changes in topography caused by industrial encroachment and photography was an additional avenue previously unavailable for portraiture, so the engineer was defined by deed, composition and interpretation.

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