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No 218

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Contents

Light Railways before 1896 — <i>Michael Messenger</i>	2
Sir John Fowler: portrait of an engineer — <i>Carl Shillito</i>	10
Inland Waterways Development 1911–1920: the Waterways Association and Neville Chamberlain — <i>Joseph Boughey</i>	22
The Viaducts and Tunnels of the Whitby–Loftus Line — <i>Michael Aufrere Williams</i>	33
Correspondence	48
Reviews	52

Cover images:

front: Sir John Fowler (1817-98), tinted photograph circa 1855. The engineer was by this time well established in London though his most notable achievements were still before him (Peter Newling) (see pp.10-21)

back: (top) Braunston Top Lock c1912, with boat family, Anchor PH and two narrow boats (Water Lily on right) (Waterways Museum, Stoke Bruerne) (see pp.22-32)

(bottom) top of Farmers Bridge Locks, Newhall branch and the Crescent wharves and carriers' depot, Birmingham, 1911 (Birmingham Reference Library) (see pp.22-32)

Light Railways before 1896

Michael Messenger

The Light Railways Act of 1896 is quite well-known, helped by the activities of Holman Fred Stephens and a slightly rose-tinted modern view of the empire he created. However this was not the first legislation to permit light railways and those created as a result of the Regulation of Railways Act 1868 are rather less well known. Some serious historians of light railways have briefly noted these early examples but have given them scant attention.¹

By the 1860s the rail network had covered much of the country but those parts not served by rail felt at a disadvantage. Most were in rural areas, however, and had little chance of generating enough traffic to justify a main line railway. By the end of this decade light railways were being laid in the Empire, India and Abyssinia for example, and a growing movement felt there were opportunities for such secondary lines at home. Logically, it was argued that it was a waste of expense to build a substantial railway to main line standards where the traffic did not justify it. Narrow gauge was one alternative but standard gauge lines could be built with lighter track and less onerous engineering. Arguments against light railways were concerned about whether main line locomotives and stock could use them and whether transshipment would be necessary.

A light railway has never been defined legally but Davies's definition sums it up well: '... a line of railway constructed deliberately below the standard of a country's main line railways for the sake of economy in construction and working and intended to open up a poor district, at the same time producing additional traffic for the main lines.'²

An attempt to reduce the cost of promoting a railway was the Railway Construction Facilities Act 1864 which enabled the Board of Trade (BoT) to authorise construction, subject to the agreement of all landowners and interested parties, by way of a certificate without the expense of an Act of Parliament. It did not mention light railways but should have been a useful means of authorising minor railways. In fact very few railways were authorised in this way and the Act proved ineffective.

In July 1868 the Regulation of Railways Bill was in Committee when Mr (later Sir) Stephen Cave MP proposed that clauses should be added enabling the Board of Trade to authorise the construction of light

railways and this was agreed apparently without discussion.³ Cave had been Vice-President of the Board of Trade until 1867, when the post was abolished, then becoming Paymaster-General, and the lack of debate may indicate that his proposal had official backing.

The relevant clauses in the Act⁴ were just three and were simple and rather vague. The first two are worth quoting:

27. The board of trade may by licence authorize a company applying for it to construct and work or to work as a light railway the whole or any part of a railway which the company has power to construct or work.

Before granting the licence the board of trade shall cause due notice of the application to be given, and shall consider all objections and representations received by them, and shall make such enquiry as they think necessary.

28. A light railway shall be constructed and worked subject to such conditions and regulations as the board of trade may from time to time impose or make: provided that (1) the regulations respecting the weight of locomotive engines, carriages, and vehicles to be used on such railway shall not authorize a greater weight than eight tons to be brought upon the rails by any one pair of wheels; (2) the regulations respecting the speed of trains shall not authorize a speed exceeding at any time twenty-five miles an hour.

The second paragraph of clause 28 specifies penalties for non-compliance; £20 a day and up to two years imprisonment, 'with or without hard labour'. Clause 29 is concerned with publishing the conditions and regulations laid down.

These clauses do not even define a light railway, but the limit of axle loading to eight tons and the maximum speed of 25 m.p.h. did give a subtle definition. These limits were the only guidance given to the BoT to licence and authorise such lines and to make conditions and regulations.

The BoT prepared a procedure⁵ to be followed. With a written application they required, in summary, a copy of the Act authorising the line, the deposited plans, tables of gradients, stations, curves, straights, cuttings, embankments, level crossings and tunnels. They wanted detailed descriptions of permanent way, locomotives and rolling stock, and to know the proposed maximum speed, an estimate of the traffic

and, significantly, an estimate of the savings to be made 'by substituting a light railway for the railway authorized by Parliament'. Notices had to be inserted in newspapers in a prescribed format. Even allowing for Victorian bureaucracy this does seem to be an exercise in making things difficult but this writer has seen no evidence that the procedure was ever followed. Clearly the BoT expected the railway to have obtained an Act, or a Certificate under the 1864 Act, and felt their role was to oversee the transition from a railway as authorised by Act to a light railway. In the event the practice was somewhat different as almost all railways authorised under this legislation incorporated in their Acts their status as a light railway.

The first railway authorised as such was the Whitland & Taf Vale Railway, in Pembrokeshire. Its Act of 1869⁶ stated 'it is intended that the railway should be constructed and worked as a light railway' and stipulated 'The traffic shall not be worked by engines exceeding sixteen tons in weight, nor at a higher maximum speed than sixteen miles an hour'. The engineer was James Weeks Szlumper (1834-1926) and it seems to have been his idea for a light railway; a standard gauge line 'with the same weight of permanent way as 2ft-3in [gauge]'. The intended traffic was minerals and slate from Glogue and Llanfymach and as a mineral line the Board of Trade only needed to inspect the junction with the broad gauge Great Western Railway just west of Whitland. A third rail was laid into Whitland and despite problems raising capital the line opened for goods traffic in March 1873.⁷

It was 11¼ miles long initially and laid with flat bottom rail of 50lb per yard but soon extended to Crymmych (14¼ miles). It cost £3,000 per mile. On extension to Crymmych it was prepared for passenger traffic but, strangely, the Board of Trade's inspector, Col Rich, failed to inspect the line within the statutory time of ten days. The directors therefore opened the line on 12 July 1875 and Col Rich's inspection 14 days later found the line 'incomplete' and belatedly ordered the opening to be postponed. The line was already open, however, but despite this the Board of Trade file carries the repeated and optimistic instruction to postpone at monthly intervals for more than the next three years.⁸ One wonders if the failure to inspect reflected an uncertainty of what to do with a light railway. By then Rich had inspected the Sidmouth line, although this had not been built entirely on light railway principles.

In 1870/1 a line was built that was, technically, a light railway but not authorised by an Act. The Duke of Buckingham built the 6-mile Wotton Tramway to connect his estate with the Great Central Railway at Quainton Road and as it was on land he either owned or controlled no Parliamentary authority was needed. It was very lightly laid with 30lb bridge rail on longitudinal sleepers and initially horse-drawn. Excluding land it cost some £1,400 per mile. Passengers were carried from 1872 and two traction-engine type locomotives bought. Col Yolland inspected the line in 1873 but refused to recognise it as a railway, although he did permit it to continue as a tramway.⁹

1870 and 1871 saw two light railways authorised in Devon, the Barnstaple & Ilfracombe Railway¹⁰ and the Sidmouth Railway.¹¹ Both were sponsored by the London & South Western Railway and engineered by William Robert Galbraith (1829-1914), who engineered many LSWR lines, particularly in the west country. These two lines opened in July 1874 but only in their permanent way do they appear to have adhered to light railway principles. They were built by an established engineer and backed by a main-line company. The Sidmouth line was laid with flat-bottom rail of 60/62lb/yard and, interestingly, its Act specified that no bridges were to be built of timber.

The Ilfracombe line included some very heavy engineering and gradients and whilst the initial 5¾ miles were laid with flat bottomed 60lb rail, the L&SWR thought better of it and continued with 72lb rail and then 75lb double headed rail in chairs. The swing bridge at Barnstaple was constructed only to take the lightest of engines but the rest of the line was, as Col Hutchinson said in his report, 'of sufficient strength to come out of the category of a light railway'.¹² Three light 0-6-0 tender engines were ordered from Beyer Peacock for the line.¹³

An Act was obtained in 1873 for a narrow gauge Devils Bridge branch of the Manchester & Milford Railway,¹⁴ engineered by Szlumper, but it was not built and light railway activity remained centred on Devon. At this time a young engineer, Arthur Cadlick Pain (1844-1937), was promoting light railways to the members of the Exeter Chamber of Commerce. Whilst his ideas were not greatly different from others he thought that the most basic of railways would meet the needs of rural communities. Laid simply on the surface of the ground with minimal earthworks and with sidings at every farm and factory, and a shelter at every road crossing, the route could follow a stream or road.

His application to join the Institution of Civil Engineers in 1870 reveals that after a pupilage with the County Surveyor for Devon, he had joined the office of Robert Pearson Brereton, one-time Brunel's chief assistant, and W. R. Galbraith. From late in 1871 he was promoting the idea of a light railway up the Culm Valley, seeking support from the Bristol & Exeter Railway as well as local worthies. 1873 proved a busy year for him as not only was that the year the Culm Valley Light Railway obtained its Act¹⁵ but he surveyed the Fal Valley (Light) Railway for the Associated Companies (the GWR, Bristol & Exeter, South Devon and Cornwall Railways), proposed and surveyed the Thorverton & Silverton Light Railway for the B&ER, proposed the Swindon & Highworth Light Railway and published a pamphlet entitled *Light Railways & Tramroads*.

The Thorverton & Silverton Light Railway¹⁶ would have been 4½ miles long from Stoke Canon on the B&ER to the village of Silverton but did not get beyond the Bill stage. In 1874 the B&ER directors decided to amend the scheme to a standard gauge railway of ordinary construction, not a light railway, but it went no further. One of its opponents claimed that a man and two wheelbarrows would meet the traffic needs of Silverton!

The Fal Valley (Light) Railway is altogether more mysterious. Two deposited plans showing a Fal Valley Railway survive but neither entirely match Pain's later description of a 2½-mile line that included a tunnel. The most likely set of plans gives the engineer as P J Margary (1820-96), of the Associated Companies, and it is possible Pain contributed to its survey. One of the engineers of the less likely plan was Silvanus William Jenkin (1821-1911), a Cornish engineer who shared a London office address with Pain. Its Act made no mention of a light railway.¹⁷

Another light railway authorised in 1873 was the Ravenglass & Eskdale Railway, in Cumberland. The engineer was George Gordon Page (1836-85) and the seven mile line was laid to three-foot gauge with 40lb rail, at a cost of £4,266 a mile. It served iron mines but also carried passengers. It opened on 20 November 1876, delayed following a damning report by Col Yolland who was not impressed by the quality of the engineering or the fittings of the stations. Disputes with the unpaid contractor resulted in a receiver being appointed just nine months later.¹⁸

1874 saw no new Acts but work started on the Culm Valley. The following year saw three more light railways authorised. The Swindon & Highworth

obtained its Act,¹⁹ with active support from Sir Daniel Gooch, possibly more in his role as member of Parliament than as Chairman of the GWR, and the GWR signed a working agreement, but it was to be another four years before work started.²⁰

The Ely & Bury St Edmunds Light Railway²¹ was another of Pain's schemes, engineered with a William Fred Butler. This 23¾-mile line, between the two places of its title, appears to have been contingent on the Ely & Newmarket Railway not being started within two years. It would have had a junction with that railway and with the Bury St Edmunds & Thetford Railway to gain access to the Great Eastern Railway. All these parties vigorously opposed the plans and the resultant parliamentary committee minutes have proved a valuable source of information. Petitions against the Bill objected to the junctions, running powers and to the fact that it was a light railway, and much of the evidence was about light railways. There was much ignorance of light railways; for example, some felt that normal rolling stock would not travel over light rails and goods would need transshipping. There was also much bias; Edward Wilson, GER consulting engineer, commenting on the Culm Valley, Pain's first railway, said 'I sincerely hope for the sake of the British public it will be his last'. As for the Wotton Tramway; 'If you go over it once you will not go again ... I walked back instead of coming [back] by it.' Another opposing witness when asked if he had ever seen a light railway replied that he had not and had no intention of doing so. Pain was proposing 45lb rail and much questioning related to this and the weights of locomotives and rolling stock.²² In the event the E&NR started construction and the E&BSELR was abandoned in 1880.

Another unfulfilled proposal of 1875 was the Bideford & Westward Ho Light Railway,²³ a four-mile line promoted by Wilkinson & Jarvis. It did not obtain its Act. James John Wilkinson and James Thomas Jarvis were also involved in a number of the constituents of the Midland & Great Northern including the Great Yarmouth & Stalham Light Railway,²⁴ initially as promoters and engineers and later as contractors and operators. It is claimed that the GY&SLR was built as a light railway, with 65/70lb rail, to prevent the Great Eastern Railway from seeking running powers.²⁵ Certainly their evidence at the E&BSELR hearing showed the GER at this time to be somewhat against light railways. It opened in stages from 1877 to 1880 and in 1879, seeking an extension to North Walsham, changed its name to the Yarmouth & North Norfolk Light Railway.²⁶

Pain was active nearby in Suffolk promoting the Southwold Railway but here he took a different course of action. The Southwold was to be a three-foot gauge railway with no involvement of or with a main line company. After initial meetings in 1875 an Act²⁷ was obtained in 1876 and work started in 1878. Less than 17 months later in 1879 the 8¾-mile line opened, laid with 30lb flat bottom rail. Due to an expensive swing bridge the cost per mile was £8,504.²⁸



Light railway simplicity: intermediate station at Walberswick on the Southwold Railway prior to 1902. A simple wooden shelter and a couple of sidings provided for local traffic

Construction of the Culm Valley Light Railway started in 1874 and followed a familiar scenario of overspending, problems with the contractor (who was sacked), shortage of labour due to the harvest or militia, etc. Col Yolland's inspection found the 40lb permanent way satisfactory although he was concerned with the point interlocking and clearances. He had earlier thought the platforms too short, at 74 feet. The seven-mile line eventually opened in 1876 but not only was it 18 months late but it cost over £40,000 instead of £22,500. As the local newspaper had already pointed out, it was only a low capital cost that would enable the line to be profitable and permit dividends to be paid. Track was laid with 40lb flat bottom rail and the B&ER had built two small locomotives for the line.²⁹

Another problem the CVLR had was that the benevolent B&ER was taken over by the GWR on 1 July 1876 and their attitude was a lot less friendly. Having satisfied the requirements of Colonel Yolland, of the Board of Trade, the directors were surprised to receive a lengthy list from the GWR before they would contemplate honouring the working agreement signed by the B&ER. Pain pointed out that the line was a light railway, built to different standards, but

the GWR would move but little. They wanted cattle pens and carriage docks, water cranes and yard cranes, water closets and clocks, and many other things that the GWR felt a railway should have. Some Pain provided, with much grumbling, and others the GWR provided, charging the impoverished CVLR for the cost.

The problems of the CVLR were being paralleled by the Swindon & Highworth. After a struggle to raise capital, construction started in March 1879 and progress on the 6¾-mile line was good although costs were over-running. Col Yolland's inspection in 1881 was damning, however. The formation was too narrow and the ballast only sand four or five inches deep. The interlocking was non-existent and the point and signal rodding too weak to be effective. The 65lb flat bottom rail was acceptable, apparently, but amongst other minor issues the 50-foot long platforms were too short and there was no locomotive turntable. The line had cost nearly £46,000 against an estimate of £28,000 so the directors, unable to raise the £9,000 required to make the line fit for opening, sold out to the GWR at a substantial loss.

The Golden Valley Railway was authorised in 1876 to build a 10½ mile line from Pontrilas to Dorstone and, after much financial difficulty, opened in 1881. Rail was Vignoles, flat-bottom, of 68lbs per yard fang-bolted to sleepers. Traffic was always slight and the line operated at a constant loss very much on a hand to mouth basis, but with help from the GWR the line was extended to Hay in 1889.³⁰

Another Devon light railway authorised in 1876 was from Sidmouth to Budleigh Salterton and Exmouth,³¹ surveyed by Galbraith & Church. This 'light' railway would have included a 475-yard tunnel through Peak Hill, at Sidmouth, but unable to raise the £130,000 capital necessary it was abandoned in 1879.

In Cornwall the Liskeard & Caradon Railway leased the Liskeard & Looe Railway, both mineral lines opened in 1846 and 1860 respectively, but in 1879 the LCR commenced a passenger service on the LLR having obtained sanction to operate it as a light railway.³² So far, this appears to be the only existing railway authorised to operate as a light railway under the 1868 Act. There is a Pain connection here as the engineer of both the LCR and the LLR was Silvanus Jenkin.

In south east England the Elham Valley Light Railway was authorised in 1881³³ to build a line from Canterbury to Shorncliffe. The engineer was Francis

Brady. It was bought out by the South Eastern Railway as a strategic move in 1884 and opened in stages as a conventional railway between 1887 and 1889.³⁴

A proposal of 1883 was the Billingham & Metheringham Light Railway.³⁵ Running for some seven miles from Metheringham station, on the GN&GE Joint line from Spalding to Lincoln, to the village of Billingham, it was engineered by R. Elliott Cooper, MICE, and Samuel Abbott. It was not built and was abandoned five years later.

One of the few railways authorised under the Railway Construction Facilities Act 1864 was the Lee-on-the-Solent Light Railway, promoted to develop a new seaside resort in Hampshire. Its Certificate of 1890 included a clause stating it was to be constructed and worked as a light railway under the 1868 Act. Opened in 1894 the 3.1-mile line was laid with 60lb rail spiked direct to the sleepers. Initially a small locomotive was hired from the L&SWR, who later worked the line but steadfastly refused to buy it. It was unprofitable from the start.³⁶

What was effectively the final light railway authorised under the 1868 Act was the Shropshire Minerals (Light) Railway, a 2ft-4in gauge extension of the Snailbeach District Railways but a slump in mineral prices meant it did not proceed.³⁷ In the month immediately before the passing of the Light Railways Act 1896 three more light railways were authorised but these were in a different era and cannot be considered in the light of the 1868 Act.

A number of railways were built which would be recognised now as light railways but were not authorised by the 1868 legislation. The Tramways Act 1870 was primarily intended for passenger street tramways but the Wantage Tramway was built under its authority, opening in 1875. It operated a passenger service until 1925 and goods traffic until 1945 and appears to have been profitable. Whilst the GER objected to light railways in 1875 in 1883 they built and opened the Wisbech & Upwell Tramway to serve an agricultural part of East Anglia. Authority for the line was included in their General Powers Act of 1882, and incorporated aspects of the 1870 legislation. Described at the time as an experiment in feeder railways it seems to have been successful, lasting until 1966, but the experiment was not repeated.³⁸ The Glyn Valley Tramway Act of 1870 specifically excluded the 1870 Act. Like the Wotton Tramway some lines were built privately without any formal authority. The 3-foot gauge Torrington & Marland Light Railway, for example, opened in 1881 as a

company railway of the North Devon Clay Co. although some ten percent of its traffic was public goods.³⁹ Two light railways for Ireland were authorised under this legislation but not built, and subsequent Irish light railways were authorised under separate legislation. Doubtless other light railways were proposed, such as Pain's Witheridge Light in Devon, but did not get beyond the wishful thinking stage.

Of the seventeen light railways authorised, mentioned above, only twelve were built, excluding the Liskeard & Looe which existed already. Despite the enabling legislation the concept struggled for recognition. The Railway Inspectorate seemed initially to be at a loss of what to do with them. Perhaps one should not read significance into the unusual failure to inspect the Whitland & Taf Vale for passengers in July 1875 but the only previous light railway that had come before them were the two Devon lines, Ilfracombe and Sidmouth, that had been constructed much more sturdily by a well-experienced and reputable engineer who had the confidence of the BoT.

In that same month the directors of the Culm Valley wrote seeking, before the official inspection, 'an opinion of the Board of Trade as to certain new features adopted on the line', adding that 'this is a railway of a rather exceptional character'.⁴⁰ The tart response pointed out that a light railway must be worked subject to such conditions as the Board of Trade may make but no arrangements had been made with the Board either as to the construction or working of the railway.⁴¹ A hand-written comment on the front of the folder stated

This is not an application for the construction and working of a railway authorised by parliament under ordinary circumstances as contemplated by the RRACT 1868, parliament having in this case sanctioned the railway as a light railway to be constructed and worked as a light railway within the meaning and subject to the provisions of that Act. This does appear to leave the description of the permanent way and the weight of the rolling stock alone to be subject to the BoT licence.

The implication is that by authorising the railway as a light railway in its Act Parliament had pre-empted the Board and their only jurisdiction was in respect of the weight of permanent way and of rolling stock, and of speed limits.

Col Yolland was duly despatched to Devon and proved quite helpful but Galbraith commented when giving evidence for the E&BSELR 'We find the Board of Trade, in passing a line, pay no regard to light



Light railway opening. Hemyock station on the occasion of the opening of the Culm Valley Light Railway on 1 June 1876. A C Pain is believed to be the fourth top hat from the left, with a cane

railways'. Certainly Pain's minimal concept of a station was not acceptable and nameboards, clocks and lamps were insisted on on the Culm Valley whilst the Swindon & Highworth was short on fencing and lighting. Before the Looe line could be granted its licence Col Rich pointed out the absence of, and need for, booking offices, waiting rooms, closets and urinals, clocks, nameboards, signals and mileposts, amongst other things.⁴² The main line companies had even more stringent requirements when they were involved.

Unable to afford the requirements of the Railway Inspectorate, the Swindon & Highworth sold out in 1882 to the GWR, who spent another £18,000 rebuilding the line and opened it in 1883 with little trace of its light railway origins other than Pain's distinctive station buildings.

The Culm Valley, burdened with debt, struggled on for four years before selling out to a reluctant GWR in 1880. They no doubt soon replaced the 40lb rail and steadily replaced Pain's timber bridges with iron. They also rebuilt and replaced the small locomotives built by the B&ER but the line did retain its light railway characteristics and as late as 1902 the GWR confirmed the speed restriction of 15mph and eight-ton axle loading.

The Whitland & Taf Vale had obtained powers to extend to Cardigan in 1877, and changed the name to Whitland & Cardigan. Construction took a long time and debts incurred in upgrading the original line to enable the GWR to work it caused the company to sell out in 1890.

The Golden Valley's 1889 extension to Hay closed in 1897, followed by the rest of the line in 1898 as revenue was insufficient even to pay wages. The GWR bought the line for a knock-down price and rebuilt it totally.

The Great Yarmouth & Stalham became part of the Midland & Great Northern Joint, thus avoided direct control by a larger main line company. The light rails used here lasted until the early 1890s. In the same period the LSWR had replaced the track of the Sidmouth and Ilfracombe lines, writing to the BoT in 1887 to say the Sidmouth line had been strengthened and ceased to be a light railway.

The Southern Railway acquired the Lee-on-the-Solent Light, despite appealing against getting the debts as well, at the Grouping and managed to keep a passenger service going until 1931, and goods until 1935.

That left the two 3-foot gauge lines, the Ravensglass & Eskdale and the Southwold, as the only light railways in their original condition. The former was in a very precarious position having gone into Chancery only nine months after opening. Nevertheless it managed to struggle on until 1913.⁴³ The Southwold actually seems to have been a success and probably more resembled Pain's concept of a light railway than any other. Significantly, whilst it was overspent on construction the debt appears to have been manageable. Also there was no involvement of any main line company and, with a non-standard gauge, the line was able to operate in isolation from main line influences.

The Culm Valley latterly also came close to Pain's ideals. Each level crossing had a station and sidings served local industries. At Hemyock the line extended into the dairy opposite and a short distance away a brickworks briefly had a siding. Both industries came about because of the presence of the railway. By the time of the GWR *Report on Branch Lines* of 1925 the line was generating a good profit.⁴⁴ Passenger traffic was always thin and the solitary coach was usually tacked on the end of milk trains. At the end milk was the only traffic and when the dairy closed so did the line, in 1975.

Bar the Lee-on-the-Solent, all the standard gauge lines became part of British Railways but few lasted

long. Apart from a link to a military depot the Golden Valley went by 1953; the Midland & Great Northern lines nearly all closed in 1959; the Cardigan branch in 1963; Highworth branch to passengers in 1953 and goods in 1962, although some private sidings continued long after; the Sidmouth and Ilfracombe branches in 1967 and 1970 respectively. Remarkably the Looe branch is still with us, for passengers only, but that was the one line not built as a light railway.

Why should this attempt to establish 'secondary' railways in England and Wales have been so unsuccessful? Of the nine standard gauge lines built three were not really light railways. Five of the other six were all financial failures, costing far too much to build and not generating enough traffic to service their capital. Perhaps if they had been built as proper secondary railways they might have survived longer as independent companies but in the event they were bought cheaply by the main-line company. Construction costs in many cases had been low, initially, generally less than £10,000 a mile but to this should be added the later costs of bringing them up to standard. Pain later said that one problem was the greed of landowners who would not sell land cheaply in the hopes of the gains a railway would bring, but the need for cheap land had been a theme of his since the 1870s.

By their nature the railways were built in areas where traffic potential was limited but the truth of the situation was rarely apparent from the promoters' publicity and only became obvious when the promised business failed to materialise. Whilst potential traffic was over-estimated, the cost of construction was under-estimated and many lines cost far more than the capital allowed, giving the new company a debt that frequently proved fatal. Main line companies took a realistic view of the potential and rarely invested, leaving local worthies to find the capital locally. Unlike Ireland and France local authorities were not permitted to invest.

The 1868 legislation still required the expense of an Act of Parliament and all the parliamentary process. Once built the Board of Trade had to be satisfied and whilst they no doubt had the safety of the public uppermost they showed very little flexibility. The range of equipment insisted upon, such as in the Culm Valley and Liskeard & Looe examples above, was hardly essential to the provision of a service. The main line companies, when they took a hand, insisted on even higher standards and soon rebuilt lines to their notion of what a railway should be. One can understand their wish for a level of

standardisation, such as the availability of motive power, but many companies had the odd branch line that did not fit the norm in one way or another and called for special treatment. The 1868 Act was superseded by the Light Railways Act 1896 and this did remedy many of the defects of the earlier legislation. It did away with the need, and expense of an Act, and not only encouraged local authorities to become involved but enabled them to lend money. The Treasury, too, could lend and also make grants. A new era of light railways commenced.

Notes and references

I am grateful to the late Tony Warren, one-time Research Officer of the Society, for much help in compiling a list of railways authorised by this legislation.

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Appendix: light railways before 1896

Act	Company	Engineer	Opened
1 1869	Whitland & Taf Vale	Szlumper	1873
2 1870	Barnstaple & Ilfracombe	Galbraith	1874
3 1871	Sidmouth	Galbraith	1874
4 1873	Culm Valley Light	Pain	1876
5 1873	Manchester & Milford, Devil's Bridge branch	Szlumper	
6 1873	Ravenglass & Eskdale	Page	1876
7 1875	Swindon & Highworth Light	Pain	1883
8 1875	Ely & Bury St Edmunds	Pain & Butler	
9 1876	Great Yarmouth & Stalham Light	Wilkinson & Jarvis	1877
10 1876	Southwold	Pain	1879
11 1876	Golden Valley	Clarke	1881
12 1876	Sidmouth Railway, Budleigh Salterton & Exmouth extension	Galbraith & Church	
13 licence	Liskeard & Looe (for passengers)	Jenkin	1879
14 1881	Elham Valley Light	Brady	1887/9
15 1883	Billinghay & Metheringham Light	Cooper & Abbott	
16 RCF			
1890	Lee-on-the-Solent	Tigg/Meik	1894
17 1891	Shropshire Mineral	Usill	

Sir John Fowler: portrait of an engineer

Carl Shillito

The 150th anniversary of the opening of the Metropolitan Railway duly commemorated throughout 2013 has appropriately drawn attention to the life and achievements of Sir John Fowler, the Sheffield-born engineer chiefly responsible for its construction. A remarkable figure in the first rank of his profession, he is suitably honoured at the headquarters of the Institution of Civil Engineers (ICE) where in 1865 aged 48 he became its then youngest president. In that pantheon of the greatest proponents of the art within these shores Fowler's likeness, painted by John Everett Millais depicting him seated at his desk holding the Metropolitan plans, is placed in equal prominence to portraits of Telford, Rennie, Stephenson and other legendary figures. Given the degree of recognition by his peers and the breadth of a career that ultimately encompassed the design and construction of the iconic Forth Railway Bridge in collaboration with his partner Sir Benjamin Baker, it would therefore reasonably be supposed that Fowler would be a popular subject for research. However, save for one full length biography by Thomas Mackay published shortly after Fowler's death, relatively little has been written that concentrates exclusively on his life and work, with the notable exception of an excellent paper for the ICE by Mike Chrimes and the authoritative Fowler entry in the *ICE Biographical Dictionary of Civil Engineers*, also by Chrimes.¹ Indeed, these excellent references apart, it seems that Fowler the man has become almost as enigmatic as the eponymous Ghost, the revolutionary and much heralded but ultimately ill-fated smokeless 'hot brick' steam locomotive that he conceived to work the first underground trains.

The reasons for this apparent neglect of Fowler are difficult to explain fully but a significant factor has certainly been the dispersal of a great deal of valuable historical material due to events surrounding his family descendants in the early 20th century. This is unfortunate since the records available to Fowler's original biographer had been very comprehensive and included correspondence between the engineer and his parents dating back to the 1830s as well as many personal letters and papers relating to events throughout Fowler's long life. Commissioned by the family, Mackay was an unusual choice of writer as

biography was not his speciality although he was quite well known as an author of political works promoting the virtues of economic liberalism, and for founding an early free-market think tank that regarded nationalisation and municipalisation as manifestations of socialism which should be firmly resisted. This philosophy chimed very closely with Fowler's own solidly Conservative views, thus making Mackay an eminently suitable official biographer. Furthermore he could also be relied upon to defend Fowler's reputation robustly in terms of acquiring material wealth, a talent in which Fowler had been remarkably successful to the extent that it attracted critical comment during his lifetime and has affected his reputation ever since. Mackay's comprehensive account of Fowler's life published by John Murray in 1900 is therefore necessarily interspersed with sections of rather dense social and political theory supporting the merits of free enterprise and individual wealth creation. Nevertheless the biography is rich in detail culled from the documentary records mentioned above as well as interviews with family, friends and colleagues and (to Mackay's credit) certain others who were more critically disposed to Fowler. Overall the book is a notable and reliable account of railway and civil engineering practice in the Victorian era and has been much quoted in works by other authors. The 2013 reprint by Cambridge University Press is therefore most welcome and timely, particularly as the veritable mine of information that Mackay had at his disposal was spread far and wide as a direct consequence of the Great War and its aftermath on the fortunes of Fowler's descendants. Indeed, had Fowler survived to a very great age he may well have regretted leading his heirs along the path of a military career and towards the ultimate sacrifice that this would entail for the grandsons of whom he was so proud.

The Fowlers at War – a legacy divided

Fowler had strong links with the military first formed through professional contact, and the mutual respect that subsequently developed between himself and officers from the Royal Engineers who served as Inspectors of Railways. Among these was Captain Lintorn Simmons who in 1849 had originally withheld approval for Fowler's box-girder Torksey Bridge,

deeming it insufficiently strong for the passage of trains, but who went on to become a lifelong friend after Fowler had used engineering theory to prove that the design was sound, garnering his peers at the ICE in support. Furthermore, in addition to this professional association with the military, Fowler was a staunch imperialist and a vocal advocate of the British Empire and its purported power to exert a civilising influence on the world.² During the campaign to relieve Khartoum in 1885 Fowler came forward to assist the War Office with detailed intelligence of the region, based on surveys for a proposed railway to Sudan that he had previously supervised under the auspices of the Khedive to whom he had acted as an advisor on engineering, transport and industry during the 1870s. The British forces' breakthrough may have come too late to save General Gordon but Fowler was nevertheless honoured with a knighthood for his considerable efforts in support of the action. He was also an officer in the Engineer and Railway Voluntary Staff Corps from 1865 until his death. Apart from these involvements with the armed forces Fowler had distinctly aristocratic pretensions for himself and his family so all things considered the army was in fact a natural choice of career for his eldest son John Arthur (who survived Fowler for only a year) and John Arthur's two sons in turn, but it was one that ended in a double tragedy with the death on active service in France of both those young men only a few weeks apart from each other in 1915. The elder had already succeeded to the baronetcy bestowed on Fowler by the Prince of Wales at the Forth Bridge opening but having had no male heir save for his already deceased brother the title reverted back a generation to the Reverend Montague Fowler, the engineer's third son and a society churchman, who promptly and eagerly took possession of the family's extensive Scottish estates at Braemore and Inverbroom. There followed a time of tension and division within the family worthy of an entertaining novella in its own right until the baronetcy became extinct on Sir Montague Fowler's death in 1933 after which the estates were broken up. A great deal of valuable historical material relating to Fowler was dispersed during this period to various family members.

Fortunately the guardians of much of this legacy have recognised its significance and in recent decades a great deal has re-emerged including artefacts such as the Braemore visitors' book illustrated with sketches by Edwin Landseer and Millais, and the model of Fowler's proposed Channel

Ferry, both of which were originally photographed for Mackay's book and which were displayed at the Forth Bridge Centenary Exhibition in 1990. More recently the location of important correspondence including letters from Fowler to his father referring to Brunel's Maidenhead Bridge under construction (1838), and to Fowler's time in charge of the Stockton & Hartlepool Railway (1841), has been established. Previously unpublished photographs have also come to light including the view of Queen Square Place reproduced below, one-time residence of the philosopher Jeremy Bentham and Fowler's London office that for several years also served as the family



2 Queen Square Place, Westminster, 1865, Fowler's London home until 1867. The building was demolished in the 1880s to make way for an apartment block in which Fowler retained his office and kept the Queen Square Place address. Government offices now occupy the site (Peter Newling)

home. Combined with other important letters extant in the family papers held in the Sheffield Archives and yet to be fully transcribed and catalogued, there is now arguably sufficient original material available to make a new Fowler biography a viable and tempting project. However, this is a very considerable task and impossible to achieve within the space permitted in a publication such as the *RCHS Journal*. A more modest objective must therefore be pursued although it would be less than helpful simply to repeat information which is already accessible to the interested reader by paraphrasing Chimes' excellent work or attempting a potted version of Mackay. Such an approach may be of general interest but it would simply read as another entry in a biographical dictionary or on-line encyclopaedia, and while this

type of reference may be very useful it would not add anything to our knowledge or understanding of Fowler's life and career. As an alternative to a list of achievements and facts a more useful approach, at which this article makes an attempt, may therefore be to examine and discuss in the form of an essay some of the principal themes surrounding Fowler, including those aspects that have drawn criticism, in order to move some way towards a constructive reassessment of his life and career.

Youthful Ambition

Born into the comfortable surroundings of Wadsley Hall on the outskirts of Sheffield, Fowler was privately educated at a local boarding school. There he showed himself to be a more than capable pupil in the classroom and on the playing field, already demonstrating the energy and strength of character that were to underpin his later achievements. His father, a gentleman farmer and land agent, acquiesced in Fowler's decision not to go to university but instead to take up an apprenticeship with John Towlerton Leather, resident engineer to the Sheffield Waterworks Company. Fowler also worked under Leather's brother George who was then involved with the development of the Aire & Calder Navigation among other major engineering works in Yorkshire and the North East. However, although Fowler was to retain strong links with the Sheffield region, he was clearly determined to widen his horizons, visiting Manchester and Liverpool in 1837, the latter place to seek an interview with one of his early heroes, Joseph Locke, who had been born at Attercliffe Common, only a few miles away from Fowler though in much more modest circumstances. By 1838 Fowler was in Birmingham where he joined the staff of John Urpeth Rastrick, an engagement that soon brought him to London. Among other projects for Rastrick he worked on the Balcombe Viaduct over the Ouse Valley and from this period showed a marked interest in bridge design. It was then that he visited Maidenhead to view Brunel's unfinished bridge over the Thames. Due to a collapse of the wooden shuttering one of the broad elliptical arches had assumed a pointed outline prompting Fowler to tell his father that it looked 'perfectly Gothick' and he speculated on what could be done to rectify matters. There followed various adventures and escapades in the employ of Rastrick until George Leather helped Fowler eventually obtain his first senior appointment as Engineer to the Stockton & Hartlepool Railway. However, although this role gave

Fowler a rare opportunity for a civil engineer in being responsible for the commercial and operational management of a complete railway he was soon planning ahead, keen to establish his own engineering practice. Initially letters to his father suggest that he was drawn to Sheffield as the location for this enterprise but perhaps in consideration to the Leathers' interests (he had asked his father not to mention his plans to them) or more likely due to his burgeoning ambition he set up in London in 1844, a bold decision that was to prove critical to his success as a professional of national and ultimately international repute.

Fowler's first commissions brought him back to Sheffield where his father's established local contacts with influential landowners including the Duke of Norfolk and Baron Wharnccliffe no doubt assisted Fowler in obtaining the role of Engineer to the Manchester, Sheffield & Lincolnshire Railway, where he was immediately occupied with the eastward extension towards the Humber. With the architect Matthew Ellison Hadfield he planned a grand Italianate façade for Sheffield's Victoria Station. This was never executed due to financial constraints though the station's approach viaduct was still impressive and included the Wicker Arch, a massive elliptical structure with classical embellishments which bore some resemblance to Brunel's bridges on the GWR at Maidenhead and Bath. Fowler was also involved with various other lines in the region including the East Lincolnshire Railway that connected with the MS&LR at Grimsby. However his office and main residence remained firmly in London which was a far more convenient location for dealing with the essential parliamentary work that formed a preliminary to any railway scheme and at which he became an adept. A London address also enabled him to associate with other leading members of the civil engineering profession at the ICE and to mix in society. This was an eventful period in London's development as a world city, leading up to the Great Exhibition of 1851, and it was around this time that the notion of an underground railway was first discussed as a serious proposition. The genesis of the underground has been very well researched and documented and involved many different personalities until the Metropolitan Railway finally opened for business. Suffice to say that Fowler was captivated by the idea from the very start and stayed close to the promoters throughout the 1850s as the scheme slowly took shape. The principal histories include references to this involvement although in some cases he seems almost peripheral to the action.

However it is difficult to see how the plans could have been realised as successfully as they were without the wholehearted commitment and support of an engineer as resourceful, capable and hungry for advancement as Fowler. As with any major infrastructure project and particularly with one that breaks new ground, scepticism abounded about the feasibility of the concept and whether or not it would attract sufficient paying customers. While some of this criticism was rooted in a general suspicion of progress there was one question to which even the most enthusiastic supporter of the underground railway idea was eager to know the answer, and that concerned the method by which motive power could be provided that would not result in the travelling public being choked and suffocated by clouds of smoke and steam in the tunnels. Furthermore it was going to be difficult to obtain parliamentary approval for the projected line without explaining how this issue would be resolved.

Fowler's Ghost

Much has been written about the theoretical concepts and the trials and tribulations surrounding the development of suitable locomotives for the underground railway, not all of which has been historically accurate. Even in more recent and well researched references certain anomalies persist, including the misleading use of the term 'fireless locomotive' to describe the eventual working prototype that was built by Robert Stephenson & Co. to Fowler's general specification. It was true that initially a hot water engine or fireless steam locomotive was considered, that could be recharged from stationary boilers at each end of the line, and indeed practical locomotives of this type were later developed, mainly for industrial use. However, it was quickly realised even before it opened that the new underground line was likely to be extended into a larger system, and that the trains were likely to be heavier than those which had originally been envisaged. A truly fireless locomotive would have neither the power nor range to cope with this scenario. Fowler and his collaborators therefore settled on an outwardly conventional steam locomotive but one where the fire could be cut off in the tunnels, heat being retained in a chamber of firebricks that would keep the steam pressure sufficiently high to power the engine, while exhaust steam would be condensed to refill the water tanks. With construction of the railway well under way, such a locomotive was delivered in early October 1861 and began trials

almost immediately. It was a quite handsome 4-4-0 broad gauge machine reflecting the close involvement of Great Western interests in the Metropolitan, the original section of line having been constructed with mixed gauge tracks.

On a trip that took place on 10 October 1861 the engine proceeded under conventional power from Paddington out to Hanwell before the firebox was shut down and the engine proceeded back towards town in smokeless mode. However, the condensing apparatus overheated, causing the test run to be abandoned. This event was referred to in Benjamin Baker's paper on the early underground railways presented to the ICE in 1885 in which he somewhat disparagingly opined that it was fortunate that nothing further was done in terms of developing locomotives of this type. Since Baker did not specifically refer to other trials some historians have implied that it was the ill-fated machine's one and only outing. But it is known now not to be the case as it was clearly and very publicly used in the VIP tour that took place on 24 May 1862 where photographs show Fowler riding in one of the contractor's wagons accompanied by Gladstone and other worthies. Indeed, it was after this occasion that Fowler sent a long and detailed memorandum to Gladstone explaining the workings of the hot brick engine. Many other runs were made with the locomotive although it was always temperamental and motive power specialists have generally scoffed at the design, pointing out that water is actually a far better retainer of heat than a firebrick chamber. However it seems that while the locomotive could certainly move on a light engine basis or with a short works train under its own power with the fire shut down, the recurring failure of various ancillary pumps connected with the condensing apparatus was a major problem, and when put to work on a gradient towards Euston it was simply not up to the task. By 1863 Fowler seemed resigned to the fact that the locomotive had no future and on the line's opening day confirmed that Gooch's GWR broad gauge engines initially employed on the line would not be of the same type, although he claimed with some justification that the condensing apparatus incorporated into their design was a direct product of the experiments he had instigated. When railway politics led to the withdrawal of the GWR engines Fowler ordered a standard gauge condensing locomotive from Beyer Peacock that proved extremely durable in service and was the mainstay of underground motive power for several decades. The

design for the 'Metropolitan Tanks' has been attributed to Fowler but as Chrimes and others have pointed out, notwithstanding his association with the Ghost, he was not greatly experienced in locomotive building and the sturdy engines owed their efficiency and durability more to the expertise of the builders and his successor as Chief Mechanical Engineer to the Metropolitan Railway, W H Burnett.³ Nevertheless Fowler deserves credit for initiating the procurement of these very successful locomotives and for his role in encouraging the development of the condensing system which was used in situations world wide throughout the steam era.



Child's ride-on Metropolitan loco, presented by the Metropolitan Railway Company to Fowler's son, John Arthur (Peter Drummond-Hay)

There is some evidence that experimental runs continued with the hot brick engine until 1865 but it was most unlikely ever to have been used in revenue earning service. In that year it was relegated to a siding at Hammersmith and advertised for sale, ending its days at the works of Isaac Boulton near Manchester where it was finally broken up in 1895. In the meantime the underground railway had proved from its very opening to be a very popular and enduring form of transport and Fowler capitalised on this success by securing work on various extensions and connections as the system developed. Construction, while not without incident, was carried out in as efficient a manner as could be expected given the plant and equipment that was available at the time and the skill with which Fowler and his assistants directed this operation through a densely built up area, diverting gas and water services and underpinning foundations, was

remarkable given the pioneering nature of the work. However, there were more than a few carping voices eager to point out that the promises of a smokeless and steamless atmosphere underground had not been met. The eventual compromise using condensing engines was mitigated to some extent by locating the stations in open sections of the newer lines, unlike the original enclosed design typified by Baker Street. Nevertheless the failure to provide an efficient form of non-polluting motive power was a setback and the principal reason why, although the London system was much admired by foreign delegations for the way in which it had been planned and constructed, underground railways were not adopted in other European cities until practical forms of electric traction had been developed.

The failure of Fowler's experimental locomotive may well have been forgotten or at least kept in perspective had it not been for an article in the *Railway Magazine* published in 1900 that speculated on the original design. Its authors stated that '...Fowler and his friends always avoided reference to this curious machine, hence our reason for christening it Fowler's Ghost.' The account was in fact some way off the mark as it was illustrated by a drawing of what was evidently a fireless hot water 2-2-2 locomotive almost certainly never built, and confused this with the dimensions of the actual Ghost, and the statement that reference to the engine was always avoided is in any case not true as the authors contradicted themselves by including Baker's account of the failed test run. Nevertheless the sobriquet has passed into railway folklore and the Ghost has become something of a music hall joke that has overshadowed Fowler's real achievement in getting the underground railway built. A fair assessment of the whole episode would be to say that it was a failure but that none of Fowler's contemporaries, even those who had a much greater knowledge and experience of mechanical engineering, could have provided a workable solution other than the condensing locomotives that were eventually adopted. It would also be fair to say that while Fowler did not dwell unduly on the matter and effectively brushed the whole thing to one side there was no organised effort to suppress what had happened. One commentator has accused Fowler of displaying an 'insular autocracy' typical of the engineers of the time in his doomed pursuit of the hot brick concept but this is somewhat harsh.⁴ Were there such a thing as insular autocracy among engineers then, Brunel's dogged and costly pursuit of the atmospheric system on the South Devon Railway, or indeed his stubborn

defence of the broad gauge, would seem to be much more appropriate candidates. In any event Fowler made the right decision to rein back on unproven technology and rely on what was known to be reliable and practical. Although there were rumours of an experimental electric Ghost making a brief appearance there is no hard evidence of its existence, and if it ever did venture onto the underground system it was perhaps just as well that it was not progressed. It is relevant to note that the Paris Metro opened in 1900 with electric trains from the outset but on 10 August 1903 a fire caused by a short circuit in a traction motor caused the deaths of 84 passengers, proving that cutting edge technology can sometimes carry unforeseen risks. Though the subterranean atmosphere may have been of dubious quality, the Metropolitan, the first railway in the world with fully interlocked signalling, was exceptionally safe by the standards of the time even though it was intensively worked, and there were no major disasters throughout the steam era, a record for which Fowler deserves not a little credit.

Friends and Foes

Fowler developed strong and lasting friendships and professional associations throughout his life. These relationships could withstand a degree of disagreement and in Captain Simmons' case there is at least one example where deep respect grew out of an initial and quite forthright clash of opinions. Mackay claims Brunel as a close friend of Fowler, although biographies of the former make scant reference to it. Certainly there were important interactions between the two men. In the case of the Oxford, Worcester & Wolverhampton Railway there was a very definite collision of personalities. Fowler had assumed the role of Engineer, assisted by his future brother-in-law John Whitton, to that company in succession to Brunel as the OWR tried to extricate itself from a commitment to operate as a broad gauge line in a protracted saga that earned it the nickname, the 'Old Worse and Worse'. The politics were complicated but in essence the GWR were anxious to ensure that the OWR complied with its Act even though the broad gauge was effectively obsolete by that time. There was a great deal of justified suspicion that the OWR did not actually intend to adopt the broad gauge as a working system but Fowler did in fact lay mixed gauge tracks and at the opening, though clearances were very tight, a broad gauge test train slowly eased its way from Oxford to Wolverhampton. As the train engine

simmered in the platform at Oxford prior to the run there was a heated altercation between Fowler and Brunel who had turned up for the trip and demanded he join Fowler on the footplate. Fowler firmly stood his ground and argued that as Engineer to the company it was his place and his alone to supervise the proceedings whereupon Brunel returned to London in a huff.⁵ However within months the rivals were clearly on speaking terms again as Brunel appeared alongside Fowler at the parliamentary proceedings that were examining the underground railway proposals. There he argued in support of Fowler and the idea that a fireless steam locomotive could work, memorably commenting that it was possible to go on a journey without taking along 'corn for your horse'.

In fact Fowler displayed a reverence and affection for his fellow engineer that lasted long after Brunel's death in 1859. This expressed itself in various ways including the removal of the panelled dining room in Brunel's former London home that had been used for Metropolitan board meetings, for reassembly at Fowler's newly constructed residence at Braemore. Much later Fowler, who had succeeded Brunel as consulting engineer to the GWR in 1860, was called on to supervise the enlargement of Maidenhead Bridge to accommodate four tracks. The famous landmark, immortalised in Turner's painting *Rain, Steam and Speed* and arguably the most graceful of all the railway bridges that cross the Thames, and which Fowler had seen during its eventful construction, was carefully widened on both sides preserving the outline and architectural detail of the original. Only a change in the colour of bricks, from pale yellow London stock to a harder wearing red variety subtly differentiates Fowler from Brunel. Completed in 1893 it was a thoughtful, respectful and well executed solution to the challenges of modernisation, indicative of Fowler's respect for Brunel's legacy.

That Fowler was capable of forming close and productive professional friendships is not in doubt, as his highly successful partnership with Benjamin Baker amply demonstrates. He could also be very loyal to associates who were facing difficulty, exemplified in his robust support for John Towlerton Leather in the aftermath of the collapse of the Dale Dyke Dam that caused the 1864 Sheffield flood disaster. However, as Mackay acknowledges, there were some contemporaries with whom Fowler would never be on friendly terms and indeed enmity is not too strong a word to describe the atmosphere that

existed between them. No more prominent an example can be found than Sir Edward Watkin, one of the outstanding railway entrepreneurs of the Victorian era. Both men held strong political views, Watkin being as fervently Liberal as Fowler was Conservative. However this alone would not necessarily have made them hostile to one other. Certainly Fowler was sufficiently pragmatic not to be averse to courting powerful Liberal politicians such as Gladstone, who sat next to him on the 1862 VIP tour of the Metropolitan and to whom Fowler addressed a long memorandum on the subject of the hot brick locomotive.⁶ Fowler also befriended William Vernon Harcourt, another Liberal grandee, who became a regular shooting guest at Braemore for several years. But between Fowler and Watkin it was perhaps simply the case that their personalities were too forceful to be able to mutually coexist within the same enterprise. In some ways the men were similar, certainly in terms of drive and imagination, and Watkin's bold attempt to construct a Channel Tunnel in the 1880s might have been expected to attract Fowler's interest. However, whether for reasons of personal rivalry or out of sensible professional judgement, Fowler countered the idea of a tunnel with a well-worked-out scheme for a Channel Ferry operating from Dover.⁷

In almost every way it seemed that Fowler and Watkin were on a collision course although, to be fair, there were many others with whom Watkin was on similarly frosty terms at one time or another. Nevertheless Fowler's long involvement with the MS&LR ended when Watkin arrived on the scene as chairman, while Watkin's ascendancy to the same role at the Metropolitan in 1872 led to the public expression of remarkably bitter sentiments on the part of Watkin towards Fowler concerning the latter's vast earnings from professional fees for the underground railway works. In fact Fowler was forced out of the Metropolitan by Watkin though he remained Engineer to the connecting Metropolitan District Railway, with which the Metropolitan had to collaborate in order to extend the underground system. In that capacity he received a forthright letter from Watkin claiming that 'no Engineer in the world was so highly paid' and demanding a 'more considerate spirit' if they were to cooperate with each other on completion of the Circle.

'Plausible' the Plutocrat

At a shareholders' meeting Watkin expanded on these comments to deliver a venomous tirade in

which the bejewelled lady occupants of the best boxes at the opera were the wife and daughters of 'Clodd, the great railway contractor' while impoverished nobility were obliged to sell their estates to 'Vampyre, the great railway lawyer'. As for the most fashionable carriages, horses and equipages in the park, they belonged to 'Plausible, the great railway engineer'. No doubt the puritanical Watkin had specific targets in mind for Clodd and Vampyre although various characters of the period would have nicely fitted the bill, but there is no mistaking Plausible as a very thinly veiled and quite extraordinary personal attack on Fowler that has permanently tainted the engineer's reputation, so much so that he has since been variously described as grasping, avaricious, swaggering, and a man whose reputation in matters of money was not good. This is a quite damning assessment and worthy of some examination to determine its validity.

There is absolutely no question that Fowler's remuneration as engineer to the Metropolitan was huge by the standards of the time, amounting to £152,000, a sum equivalent to nearly £12 million in present day value, and while a portion of this would have been passed to staff and contractors it was still exceptional. Moreover he gained an even larger amount from his work on the Metropolitan District. These immense earnings enabled him to acquire among other possessions the vast Scottish estates in Ross-shire, and to hobnob with the aristocracy on something like equal terms. Indeed the ultimate extent of his wealth that included an extensive collection of pictures featuring Old Masters and works by Turner and Landseer, substantial homes in London and Scotland, sea-going yachts, and all the trappings of an aristocratic lifestyle, went quite beyond the upper middle class position that might have been expected for a man who was after all only the head of a professional practice, not a manufacturer or contractor employing thousands in a huge concern. As for Watkin's withering description of high society goings on then it must be conceded that Fowler was an enthusiastic participant. The diaries and letters of Carl Abraham Pihl, the pioneering Norwegian railway engineer and proponent of the 3ft-6in gauge that Fowler favoured for narrow gauge railways in India, provide a valuable insight into Fowler's personal life in the 1870s. Pihl enjoyed Fowler's hospitality whilst en route from Norway to North America and again on the return journey.⁸ He describes a constant round of society gatherings, musical soirees and concert going punctuated by visits to Fowler's office and a

trip to the industrial Midlands when he travelled in the Duke of Sutherland's private railway carriage. Sutherland was a close associate of Fowler who regularly entertained the engineer and his family at Dunrobin Castle. That Fowler comfortably inhabited the upper echelons of society by this time there is no doubt, though he was not so detached a snob that he could not extend a warm and friendly welcome to those he respected such as Pihl, regardless of their relatively humble background, and draw them into his circle.



*On board the Southern Cross circa 1880. Sir John and Lady Fowler (seated) with their daughter-in-law Alice (married to their eldest son John Arthur). This vessel, the first of three yachts that Fowler owned all of which carried the same name, was built for him in 1878.
(Peter Newling)*

The extent of Fowler's great wealth was self-evident. The more pertinent question is how it was acquired. In his letter Watkin had asserted that 'Taking it any way you like — time, speciality, risk, quantity, value or all combined, you have set an example of charges which seems to me to have largely aided in demoralisation of professional men of all sorts who have lived upon the suffering shareholders for the past ten years'. In other words Fowler's fees were nothing less than extortionate. This stern rebuke must be viewed in the context of the undoubted

personality clash that existed between the two men. However, there is more than enough evidence to prove that Fowler's charges for other railway companies were sometimes the source of considerable dispute and disquiet as a similar scene played out in various boardrooms over the years — where Fowler's bill arrived to be met with raised eyebrows and a frown or two at the very least, and sometimes an expression of profound indignation. A typical dispute arose with the GWR directors concerning work that Fowler had undertaken in the 1860s in connection with a proposed goods depot at Farringdon in London. This dragged on for a decade and due to the time lapse Fowler added interest on to the account. The GWR representative sent to Fowler's office to verify the charges was met by the engineer's loyal and long serving business manager, James Danford Baldry. Baldry was well practiced at presenting all manner of ledgers and journals showing the time and trouble that had been taken on the works in question, not to mention details of the arduous parliamentary work. This particular account was eventually settled, although the GWR balked at the interest charges.

However, in addition to professional fees it is evident that from the outset of his independent career Fowler was looking for opportunities to profit from dealing in land and property that might increase in value due to railway development. Though he avoided being drawn in to the major scandal involving the Humber ferries that engulfed the directors of the MS&LR in the 1850s it is noted in records that he had purchased property at Barton on Humber when the railway was being extended there. There was also a hint that Fowler was closer to his contractors than would seem to be strictly appropriate. Indeed he gave evidence to Parliament on the question of the controversial practice of contractor subscription to railway shares, a subject in which he was quite an expert and had experience of the arrangement at least since the building of London's Victoria Station in 1858-62, where he was in collaboration with the contractor (Sir) John Kelk. Later the construction of major city terminals such as Liverpool Central and Glasgow St Enoch in which Fowler was intimately involved provided opportunities for property dealing and speculation by contractors and solicitors that crossed into the territory of fraud according to at least one authoritative source.⁹

From this general picture it would seem reasonable to argue that Fowler was a man who never undersold

himself, charged a healthy premium for his services that was arguably justifiable but sometimes the source of dispute, and was open to various money making opportunities that presented themselves in the course of his business life; he had an eye for the main chance in fact. Sometimes this reputation could unfairly reflect on his dealings as was the case when critics in the New South Wales government challenged his consulting fees to the railway system for which John Whitton had become Chief Engineer. There was a suggestion that inflated prices were being paid for rail imported from England, though an investigation subsequently cleared Fowler and Whitton of any impropriety. Nevertheless Fowler's reputation for money grabbing did go before him in spite of his many positive qualities and achievements. Perhaps there was something more in his personality to reinforce this impression than can be read in official documents. A clue can be discerned in letters between Fowler and his brother's doctor. Henry Fowler had been a promising engineer in his own right, starting as a pupil to Leather, then working on the East Lincolnshire Railway under Fowler, before eventually embarking on a voyage to India where he was engaged on building the Great Indian Peninsular Railway. However his career was cut short by illness and he returned to Sheffield in poor health, where he died in 1854. His physician J K Booth MD had attended him on a very regular basis at Wadsley Hall, though he was apparently able to do little to treat Henry's condition. An account was duly rendered but remained unpaid for a year despite protests from Booth. Fowler eventually paid £66 13s 6d but not without sending a curt letter accusing the practitioner of making visits of his own volition and not at the request of the family. Fowler's own copy of the letter included the words 'with many thanks for your attention' very firmly crossed out. It is possible that the man had attempted to take advantage of a wealthy family and that Fowler was justified in his anger.¹⁰ However the incident contributes towards an overall impression of Fowler that was held by many of those who had dealings with him, that of a man who was passionate about acquiring money and took a great deal of care in the dispensing of it.

A Golden Opportunity

Fowler's reputation with money could be regarded as irrelevant to his technical and managerial prowess were it not for a possibility that some of the schemes and ideas he had been associated with in the 1860s and 1870s, such as a Severn crossing for example,

had been scuppered due at least in part to a general wariness on the part of railway directors in dealing with the entrepreneurial engineer. It may also be one reason why Fowler's political ambitions were never realised and there must have been some disappointment on his part that he never sat as an MP, unlike other engineers such as Locke and Stephenson. Neither of the seats he stood for (he was beaten at Tewksbury in 1880 and withdrew from the contest at Sheffield Hallamshire in 1885 on health grounds) were ever likely to fall to the Conservatives in the year Fowler was candidate. Again the question poses itself as to why a safer route to Parliament was not forthcoming, and coolness towards Fowler within some sections of the establishment is a credible explanation. However this is speculation albeit based on reasonable suspicion. What is clear is that Fowler and his associates, including Thomas Marr Johnson and Benjamin Baker, undertook a great deal of theoretical work in this period on the construction of large bridges that failed to find a market. Not that their overall business was unsuccessful by any means since Fowler and Baker, who had become his partner in 1875, built up a formidable consultancy practice that encompassed projects world-wide as well as making a significant contribution to the development of the first tube railways in London. However their ambitions in relation to bridge design seemed likely to remain unfulfilled until, in December 1879, a great disaster at last presented Fowler and Baker with an opportunity to realise their concepts for a long span structure. The facts are very well known; the Tay Bridge collapsed in a storm with the loss of a train and over 70 lives, its engineer Sir Thomas Bouch was disgraced and died a broken man within a year. His design was shown to have been woefully deficient in terms of resistance to wind pressure, indeed Fowler had wisely forbidden any of his family to travel over the bridge. Fowler was in a London art gallery attending an exhibition of works by Holbein when the news of the collapse was brought to him. Referring to the pose customarily adopted by Holbein's male subjects, standing with legs apart as in the artist's famous portrait of Henry VIII, Fowler reasoned that the bridge would never have collapsed had the design adopted the 'Holbein straddle' for the supports. Most significantly for Fowler the disaster led to the cancellation of Bouch's Forth Bridge commission and gave the engineer and his professional team a unique chance to put into practice the ideas that had been developed over many years.

The preliminaries involved the consulting engineers of the railway concerns that were promoting the Forth Bridge Railway Company meeting to discuss a replacement for Bouch's discredited scheme. Fowler was among their number and it was a cantilever design by Fowler and Baker that was subsequently chosen, construction starting in 1883 and lasting seven years. This was not necessarily a formality and at one time their proposal may well have been ruled out on grounds of cost, but the Tay Bridge tragedy concentrated minds in favour of the partners' impressively engineered solution. Baker spent the greater time on site and was chiefly responsible for the calculations and detailed design for the steel superstructure while Fowler applied himself to the design of the approach lines and viaducts and executive supervision over the whole enterprise, signing all the contracts. Both Fowler and Baker can be credited with the careful application of aesthetic principles as far as functionality would allow, notably the gentle curvature of the tubular girders that makes the spans appear so graceful in comparison to the greater but visually more angular single span of the Quebec Bridge, the world's most closely comparable engineering structure. The structural and constructional detail of the Forth Bridge hardly need repeating since the entire project was exceptionally well documented and a superb photographic record exists of the building from start to finish. Many publications have since done justice to this marvel of the engineering world. The impressive statistics are also well known although in recent times there has been some dispute over the number of lives that were lost during construction. It had generally been recorded that 57 workers died but local researchers have challenged this figure suggesting that the true figure could have been as high as 98. Although this may be true the safety measures and welfare arrangements were quite comprehensive by the standards of the time, while Fowler himself was known to express regret at the loss of life when it occurred, so it would be wrong to impute that there was a callous indifference to the hazards faced by the workforce.¹¹

Crowning Achievement

Contrary to popular myth major civil engineering projects in the Victorian era were not invariably built on time and on budget, certainly not those that simultaneously broke new ground in terms of size, design and construction materials as was the case

with the Forth Bridge. Major challenges had to be overcome before it was opened. By 1887 it is evident from the tenor of the monthly engineers' reports that the directors were growing restless at the rate of progress and the escalating costs, which were largely down to the much greater expenditure on plant than had been anticipated at the outset. The works had been expected to last five years and cost £1.6 million but already this figure had been exceeded and four years had elapsed with completion seemingly a far off prospect. Matters came to a head so much so that Fowler was charged with presenting a special report on the cost and time of completion. It was a consummate display of Fowler's powers of presentation and persuasion that enabled him to carry the day and give the directors the assurances they were seeking. The revised schedule estimated the cost from that time to the point of completion to be £644,000, very close to the actual figure that was achieved, and an opening date in October 1890. In the event the spans met on 6 November 1889, test trains ran from 21 January 1890, and the official opening took place on 4 March of that year. It was a triumph by any reckoning and the ultimate success of this enormous undertaking owed a great deal to Fowler's professional courage and skill in maintaining stakeholder confidence through difficult times.¹²

The scale of the achievement from start to finish cannot be overstated and is particularly notable, in addition to the innovative use of steel, the impressive design elements, withstanding the challenging natural conditions and so on, for the effective management of a truly international coalition of contractors and staff. European firms included the Belgian manufacturers of the caissons that formed the foundations of the cantilever structure, and French suppliers of asphalt, both of which brought their own management and skilled labour to Scotland. On Fowler and Baker's staff significant non-British personalities included Wilhelm Westhofen, the German engineer who wrote a notable account of the entire project for *Engineering* that was reprinted in the form of an impressive commemorative volume, and Kaichi Watanabe, one of the first Japanese engineers to receive training in the West. It is he who was memorably photographed seated on a plank between two human supports in one of Baker's typically imaginative demonstrations of the cantilever principle. For those inclined towards a more superficial examination of Fowler's patriotic credentials this international dimension may be something of a revelation but it is in fact

representative of a man whose professional and personal experiences, at least in his case, proved that travel can indeed broaden the mind. This is after all a man who brought young Egyptian men back to London, in spite of the Khedive's scepticism, to be trained at his office. A man who in his presidential address to the ICE that centred on the professional training of new recruits to the profession, on which subject his contribution was notable in the history of that organisation, held that a working knowledge of French and German was an essential part of an engineer's education. A man who, when he was informed that a party of students from the Royal Technical High School of Berlin was due to visit the Forth Bridge site, wrote to his staff in order to ensure that they were given 'the opportunity to see every detail both of the work, and the drawings'. On the other hand, making preparations for a visit by the Shah of Persia, he could be similarly insistent to his staff that Lady Fowler should 'have a very nice landau for herself during the time she is at the bridge, with a pair of good smart horses' but given the immense task in progress Fowler's grand manner can perhaps be forgiven on that occasion.

Epitaph

The Forth Bridge was the apogee of Fowler's career and he scaled back his professional commitments in the 1890s although continuing to act as consulting engineer to the GWR and likewise maintaining the partnership with Baker until the end. The last major railway line with which Fowler was closely involved, in association with Murdoch Paterson, was the Perth to Inverness direct line for the Highland Railway, completed in 1898. On that route Fowler had a hand in the impressive Findhorn Bridge at Tomatin, reminiscent of the Forth Bridge approach spans, and the elegant Nairn Viaduct at Clava near Culloden, a particularly fine example of traditional masonry construction that has been called the Forth Bridge in stone. Fowler's life in later years was centred increasingly around the Scottish estates that were embellished by symbols of his engineering prowess such as the suspension bridge over the Corrieshalloch Gorge. At Braemore he lived out the role of patrician aristocratic Highland laird that he had created for himself. A degree of eccentricity crept into his persona as when he repeatedly petitioned the Government, including his old acquaintance William Vernon Harcourt, who had by then risen to the rank of Chancellor of the Exchequer, for financial assistance to build a branch railway past Braemore

to Ullapool on Loch Broom. The scheme was hardly ever likely to be more than marginally viable and in any case state investment was supposedly anathema to Fowler.¹³ His health failing at last, Fowler was on a visit to Bournemouth when he died peacefully on 10 November 1898. The funeral took place in London before he was laid to rest in Brompton Cemetery. Fowler's passing was noted in the press but from that point the somewhat ephemeral nature of his social position became evident and the declining fortunes of his heirs had a bearing on the relative obscurity into which his reputation lapsed. First to go was the prized collection of pictures which raised over £65,000 in order to meet death duties, while the ultimate fate of the estates and the baronetcy have already been described. The neo-baronial pile at Braemore at least proved solid, so much so that it was eventually blown up by its last owners.¹⁴ Paradoxically the engineer's birthplace Wadsley Hall and its outbuildings, now surrounded by suburban housing, are well preserved as a private residential development and in Sheffield the monumental and newly restored Wicker Arch is a reminder of Fowler's association with the city. Elsewhere there is little in the way of formal commemoration. Fowler's grave is neglected and unlike several of his more notable peers including Baker he is not remembered in Westminster Abbey. There is a blue plaque marking Bentham's association with the site of Queen Square Place but no mention of the great engineer who lived and worked there.

This is scant regard for a career that encompassed such a wide range of projects and, in the case of the underground railway, provided an outstanding contribution not merely to the development of transport but to the evolution of cities and urban civilisation. However, at the time of writing an opportunity has presented itself to redress this state of affairs to some extent with the news that the Forth Bridge is to be formally nominated for inclusion in UNESCO's schedule of World Heritage Sites. Part of this plan will see the establishment of a visitor centre that will allow public access to the top of the cantilever structure. An appropriate acknowledgement to Fowler's role in the design and construction of this great engineering work as well as reference to his wider career would be more than appropriate and go some way to the rehabilitation, if that is not too strong a word, of the reputation of a man who had his faults and foibles, who was not universally liked or approved of, to whom his associates were loyal but of whom his adversaries

were always wary and sometimes mistrustful, but who is without doubt a professional equal in stature and achievement to any of the greatest figures in 19th century British civil engineering and railway construction.

Notes and References

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I would also like to thank the following for their help and advice on the subject of Sir John Fowler: Mike Chrimes, Prof. Roland Paxton, Earl of Elgin and Kincardine, Prof Robert Lee

1. M M Chrimes, *Sir John Fowler – Engineer or Manager?*, Proc. ICE, 1993, Paper No. 10118. Head of Library and Information Services at the ICE for more than twenty years, Chrimes is now the organisation's Director for Engineering Policy and Innovation
2. Fowler's time in Egypt under the Khedive's patronage instilled a lifelong fascination with the country, its history and its peoples. Following the collapse of Ottoman rule and the imposition of British control Fowler advocated full integration into the British Empire as the best means of increasing the wellbeing and prosperity of the population. It is a debatable view, but was sincerely held (see Mackay p.334: Fowler's letter to *The Times*, 1884)
3. R L Hills & D Patrick, *Beyer, Peacock – Locomotive Builders to the World*, Transport Publishing Co., 1982. The most detailed account of the Metropolitan Tanks.
4. 'Steamologist', 'Facts and fables of "Fowler's Ghost"', *Railway World*, Jan & Feb 1974. An entertaining commentary on the subject but contains some errors
5. J Boynton, *The Oxford, Worcester and Wolverhampton Railway*, Mid England Books, 2002. Draws on research by M Hale
6. It should be noted that Gladstone was Chancellor of the Exchequer at that time, not the Prime Minister as some references have erroneously stated
7. While the vessels he envisaged were rather insubstantial compared to those eventually used several decades later, the proposals anticipated to a remarkable degree the facilities that were in use at Dover until rendered obsolete by the Channel Tunnel constructed in modern times
8. Carl Abraham Pihl, *Jernbane-Byggeren*, Norwegian Railway Museum, 1995. Fowler had been so impressed with Pihl's work in Norway that he submitted a dissenting report when the commission to which he was appointed recommended the three foot gauge for minor Indian Railways. He argued that three feet six inches as adopted on the Norwegian system enabled much heavier and faster trains to operate for only a modest increase in construction costs. It was a sensible view and the gauge was widely adopted in British colonies, as it was also in Japan. Bizarrely the Indian Government actually opted for the metre gauge in a flirtation with metrication
9. J R Kellett, *The Impact of Railways on Victorian Cities*, Routledge & Kegan Paul, 1969. Refers to research by T C Barker and H Pollins
10. Sheffield Archives, Letters and Papers relating to the Fowlers of Wadsley Hall
11. ICE Archives, letters from Sir John Fowler to F Cooper
12. Imperial College London, Civil Engineering Department Library
13. Bodleian Library, Harcourt Papers. For an irreverent but amusing fictional account of the building of this railway see A Drummond, *An Abridged History*, Polygon 2004
14. The property was apparently bequeathed to the Scottish Youth Hostels Association at some point and this was when demolition took place. The fate of Brunel's panelled dining room is unknown

OXO advertisement hoarding, 1890s.
The Forth Bridge had made Fowler and his partner popular figures to the extent that their images were reproduced for product endorsement purposes, presumably for a fee
(Peter Newling)



Inland Waterways Development 1911–1920: the Waterways Association and Neville Chamberlain

Joseph Boughey

On 3 September 1939 Neville Chamberlain told the House of Commons

– This is a sad day for all of us, and to none is it sadder than to me. Everything that I have worked for, everything that I have hoped for, everything that I believed in during my public life, has crashed into ruins.

He was, of course, referring to the outbreak of war, and he may well always be associated with the policy of appeasement. Yet in the field of transport history Chamberlain could have been well-known for his support of inland waterways development; between 1911 and 1926, he was probably its leading supporter in Britain. About this, however, one Chamberlain biographer commented that ‘In the sphere of domestic politics there was probably no subject which occupied more of Chamberlain’s effort for smaller return.’¹ This article will consider the nature of Chamberlain’s early campaigns for waterways development up to 1920, when he chaired a Commons committee to consider the possibilities of development. Later articles will take this account through to the 1930s.

The Royal Commission, the Waterways Association and Chamberlain

Chamberlain’s practical interest with waterways seems to have begun with the Royal Commission on the Canals and Inland Navigations of the United Kingdom. Some public interest emerged in its recommendations after it issued its Final Report early in May 1911. Its proposals to enlarge the Severn Navigation, and extend it via a new line to Birmingham, resulted in a conference at Worcester on October 25 1911, organized by the Severn Commission, which controlled the Severn north of Gloucester. All speakers at the conference supported improvement, from varied locations and motives. Birmingham interests included Alderman W H Bowater, who presided as Lord Mayor of Birmingham, and the accountant Frank Impey (see below). J C Forrest of the Cannock Chase Colliery stressed that exploitation of his colliery and the Cannock coalfield was inhibited by poor means of communication. The Mayor of Cardiff supported the ending of

transshipment to and from smaller vessels at Worcester. Shropshire County Council sought the restoration of navigation on the Severn upstream from Stourport; a Bridgnorth representative hoped to improve trade at Bridgnorth, Ironbridge and Shrewsbury, while the Mayor of Bewdley cited the waterside Highley colliery.

This conference was also supported by Lord Shuttleworth, who had chaired the Royal Commission, the Mayor of Worcester, and Henry Terrell, MP for Gloucester. At the end of the conference Chamberlain spoke, as a manufacturer and Chamber of Commerce member, commending the setting up of a committee.²

There is little evidence of any previous involvement by Chamberlain with waterways, although he came from a leading Birmingham political family, in a city where plans for waterways improvements had been promoted since the 1880s. Neville had spent much time in the Bahamas, from which he only returned in 1896. His interest was then in manufacturing: he joined the board of Kynoch’s, which manufactured armaments, and then became a director of Elliotts, a metal firm which used the Worcester & Birmingham Canal adjacent to its Selly Oak factory. Unlike some company directors, he took a close interest in this operation, but laid no particular emphasis on its transport connections.³ Scaling down his involvement, through family connections he purchased Hoskins & Son in Bordesley, which was rail-served. From 1905 he was a director of British Small Arms (BSA); the Royal Commission had proposed a 100-ton waterway from Wolverhampton to Birmingham and a new canal, four miles long, from Bournville to the Warwick & Birmingham Canal near the BSA factory.⁴ It seems that it was in 1905 that he became interested in canals, as did others just before the Royal Commission was formed.⁵

Neville Chamberlain’s politics, advocating public ownership of utilities, including canals and railways, may appear to twenty-first century perceptions to lie on the political left. Addressing the Birmingham Junior Imperialists in December 1913, he said that if he ‘advocated the nationalisation of canals he was told by Socialists that he was doing their work’. He

deemed the lack of canal development 'partly due to the habit of our people since the days of Cobden of adopting the policy of *laissez faire*. It was thought to be a sort of heresy, even blasphemy, to interfere with what was considered to be the natural course of trade'. However, he stressed that most Continental waterways were owned by the State.⁶

In reality, Neville (henceforth 'NC') supported his father Joseph's politics as a Liberal Unionist. Repudiating any notion of a past golden age, his approach was somewhat Milnerite and social Darwinist, seeking modernization and 'national efficiency'. He sought to progress the position of the working class and the poor, both through industrial welfare and, especially in the Birmingham case, through town planning, which was then in its infancy in Britain.⁷ His various public involvements ranged from local hospitals to the founding of Birmingham University. His personal political ambitions were limited until 1910, when the extension of the council area of Birmingham promised suburbanization, facilitated by public transport, which might bring about a healthier workforce and social cohesion. NC was elected as a councillor in 1911, when Birmingham's expansion was confirmed; his election address, which does not seem to have survived, advocated the revival of canals and town planning. Town planning would feature strongly in his postwar agitation for a new canal route to Birmingham. It would not be long before he became an alderman, and Lord Mayor in November 1915.

If too much stress seems to be laid here upon Neville Chamberlain, it should be emphasized that other supporters of waterways development saw him as a leader; in 1914 a meeting of the Parliamentary Committee of the Waterways Association was postponed as it was suggested that members would not come if Chamberlain was not there.

A significant ally was Frank Impey (1858-1940), who was appointed as secretary of the new Waterways Association. He had become a chartered accountant in 1883, and was then appointed secretary of the Birmingham and District Railway and Canal Freighters Association. Impey had soon become secretary of a committee, including interests in Birmingham, Wolverhampton, Severn and Bristol Channel towns, which sought to build a new 'Ship Canal', for vessels of 200 tons, from Birmingham to the Bristol Channel.⁸ Sharing Chamberlain's political outlook, he seems to have been an important influence and supporter.

The Waterways Association develops: 1912-15

Formal records of the Waterways Association (henceforth WA) seem not to have survived, and the following account draws on newspaper reports and other sources.

Birmingham interests were central to the WA, and its first General Committee was convened in Birmingham Council Chamber on 10 January 1912. At first W H Bowater chaired this, but NC was then appointed chairman and Impey secretary. The WA Committee was joined by representatives of various Councils, including many waterside West Midlands councils, like Kidderminster, Stourbridge and Birmingham, and more distant ones like Derby and Burton-on-Trent. Coastal South Wales was represented by several local councils, including Barry, Cardiff, Newport and Swansea, along with port cities like Liverpool, Manchester and Hull, and Lincolnshire (on the lower Trent). Waterways owners and authorities included Sharpness New Docks and the Severn Commission. Private individuals ('gentlemen') who joined included Midlands traders like Edward Hickman, J S Nettlefold, and Edward Tailby, along with Ebenezer Parkes, veteran Birmingham MP.⁹

Surprisingly, the WA had no copies of the Royal Commission volumes, so that Impey was instructed to produce a digest. Chamberlain led a deputation to the President of the Board of Trade, Sidney Buxton, on 9 July 1912; the Prime Minister, Asquith, had declined due to his close involvement with the coal dispute. NC asserted that only unified state ownership, as on much of the Continent, could resolve the problems caused by railway ownership. As an early step, he advocated the appointment of a Waterways Board and the State acquisition of the routes between the main estuaries.¹⁰ This corresponded to the Royal Commission's proposals to modernise the waterways of The Cross, which linked the Midlands to the four main estuaries of Severn, Mersey, Trent/Humber and Thames.

Buxton responded that while the government supported a single authority, it could not make proposals 'with the pressure of other matters and particularly recent financial pressure'. He stressed that 'the Government were not taking in any sense an adverse or hostile view. It was mainly a question of time, opportunity and practicability ...'. The WA's view was that growing trade would necessitate alternative means of heavy transport, and that its position was thus not hostile or damaging to railway companies.¹¹

By December 1912, the WA had been joined by members from Nottingham, Stoke and Wolverhampton. As there had been no progress since the July deputation, 'a sub-committee was appointed to confer with various members of Parliament with a view to forming a non-political party to give effect by legislation to the recommendations of the Royal Commission.'¹² By 5 June 1913 this Parliamentary Committee had 32 members, and a meeting at the Guildhall, presided over by the Lord Mayor, was planned for 20 July.¹³ It was then chaired by the Gloucester MP Henry Terrell KC, while Ebenezer Parkes was secretary.¹⁴

By May 1913 contributions to WA funds of £670 had been promised towards its proposed annual funding of £1500 p.a. for three years, mostly by Midlands manufacturers and waterways undertakers. The four largest contributors were Cadbury Brothers, Brunner Mond (on the Weaver), Birmingham Small Arms Co. Ltd, and the Bristol Docks Committee. Other Midlands industrial concerns included Elliott Metal Co (£25), Alfred Hickman Ltd of Bilston (£25), and Archibald Kenrick & Sons Ltd (£20), which had family connections with NC. Waterways concerns included the Severn Commissioners (£25) and Sharpness New Docks Co. (£25), which together represented the line from the Severn to Birmingham.¹⁵

On 19 May 1913 the WA circulated a booklet, a manifesto in all but name; Edward Hickman was now treasurer. Pointing to rising trade and rising rates, it suggested that competition with railway rates was now essential. Endorsing the Royal Commission, it sought unified ownership, and specifically the end of railway ownership of waterways, after which development could follow. As it seemed impractical to collect evidence of potential traffics, since many traders might thereby alienate the railway companies, it sought what it termed educational propaganda. A digest of the Royal Commission report was to be sent to MPs, councils, chambers of commerce and labour organisations. The aim was to develop pressure through public opinion and to solicit a guaranteed fund of £1500 p.a. for three years.¹⁶

Railway rates, and then canal rates, were raised in the spring of 1913, citing the greater costs of labour and materials. Impey, interviewed in *The Times* on 14 June 1913, suggested that it had been hoped that rates would fall, that the increase would burden local industry, especially the heavy trades in the Birmingham area, but that freight costs could fall if waterways were developed. At a conference on 20 June, presided over by the Lord Mayor of London,

Chamberlain asserted that the WA report 'showed their first assault upon apathy and ignorance' and described the Government attitude, demonstrated by the meeting with Buxton, as 'passive resistance'.¹⁷ He was supported by the Bristol MP Sir William Howell Davies, who was also a longstanding member of the Bristol Council.¹⁸

Support grew in Yorkshire, so that by July, councils in Leeds, York, Bradford and Sheffield had joined, while the Gainsborough MP George Bentham and Sheffield MP Samuel Roberts had joined the Parliamentary Committee. The Weaver Navigation Trustees, highlighting the heavy freight charges in traffic to the Potteries and Midlands, invited WA members to join their inspection from Winsford downstream.¹⁹

At the end of September 1913 NC recorded a Birmingham Town Council meeting at which his proposals met approval. He organised a boat trip between Lapworth and Hatton on the Warwick & Birmingham Canal, for Birmingham interests and representatives from Sharpness, Stoke-on-Trent and Walsall Wood. These inspected Fellows Morton and Clayton steam boats at Lapworth, while Impey explained the proposed improvement of the line to London. NC now stressed opposition from railway companies.

A new emphasis was laid on local authority contributions. On 21 October 1913 Chamberlain brought a resolution before Birmingham City Council, to support the formation of a Central Waterways Board and to contribute to the costs of waterways improvements, with the resolution to be forwarded to the WA and the Prime Minister. He met objections to local contributions by asserting that 'if they waited for Government proposals, they would all be in their graves before they got it'. Quoting the example of Manchester, NC stressed that Continental waterways development always involved some local contribution and negotiations, such as over the canal from Milan to Venice. Although the Corporation might have to provide terminal facilities and wharves, it could charge dues for these; the proposed new canal between the Worcester and Warwick Canals, costed at £350,000 by the Royal Commission, would lie within the City boundaries. A new Board would promote improvements to the 100-ton standard, but would begin with a small area. Unanimous support (for an amended resolution) included that of Alderman Bowater and George Cadbury junior; the latter would become a leading supporter of development. However, WA Cadbury argued successfully against

support for the development of the whole of the Cross, which would include lines to London, the Mersey and Trent. He stressed that Birmingham's best route was to Sharpness, which was already satisfactory below Worcester.²⁰ This reflected a theme in the general approach to the improvement of inland waterways, that particular localities would benefit more than others, and thus local support for general improvement would be limited.

The *Morning Post* of 24 October 1913 reported the Birmingham decision favourably, and noted support from traders in Nottingham. Leicestershire support included the opening of granite quarries, the carriage of bricks, and even sewage sludge. Although the proposals seemed to benefit Birmingham more than other areas, a Sheffield representative stated that Sheffield would benefit, as it had from the Manchester Ship Canal.²¹ However, a Bradford Chamber of Commerce representative now stated that he had changed his view, deterred by water supply problems (presumably inspired by the Bradford Canal itself, which was only supplied through extensive back-pumping). More eccentrically, Danson Cunningham, a Mersey Dock and Harbour Board member, favoured the conversion of canals into motor highways, as 'tracks for the electrical haulage of heavy motor traffic'. This would obviate the need for heavy terminal charges at railways, which greatly inflated rates.²²

Chamberlain also gained the support of the Association of Municipal Corporations, although the Mayor of Blackburn and the Town Clerk of Chester were opposed, on the grounds that this was beyond the scope of the AMC. Support came from Chatham, Hull, Reading and Burton-on-Trent, with a successful resolution.²³ Later, the *Morning Post* recorded support in Wolverhampton, Bristol (where a past BCC president was a WA executive committee member), Northampton (where the slow narrow canal connections were of little use), and even Bedford, where the Corporation was considering improvement of the Great Ouse to Kings Lynn. Surrey also supported the WA by a majority.²⁴

There was some opposition to the use of public funds, in Derby where Alderman J W Gandy, a canal carrier, headed a special committee, and in Bradford, to the principle of local expenditure.²⁵ Staffordshire County Council later recommended (on 11 November) to take no action upon the WA resolution, to the regret of Albert Stanley, the Potteries Labour MP, who had asserted that 'the waterways we had at the present time were a disgrace to us. Better roads

and a better canal system would do more to bring trade to this country than Tariff reform would do in a century'.²⁶

On 13 November 1913 Chamberlain and Impey addressed the Sheffield Chamber of Commerce, with others from Huddersfield, Hull, Stoke, Rotherham, and even Linthwaite (located on the narrow Huddersfield Canal). The Master Cutler stated that the opening of the Manchester Ship Canal had reduced rates from Liverpool to Sheffield. While Impey conceded that Sheffield would not be served directly by the improved waterways of the Cross, he suggested that once a Waterways Board was established, other districts could be included. There were objections. George Welch, general manager of the Sheffield and South Yorkshire Navigation (which was partly railway-controlled) interrupted, while others complained that the Royal Commission had not dealt with Yorkshire waterways, and that Chamberlain was only there to represent Birmingham. Nevertheless, the Mayor of Huddersfield supported development.²⁷

The WA annual report for 1913 recorded progress, including many resolutions by councils and other bodies. While the increased use of motor power on waterways was noted, there were no other developments. Improvements to French waterways since 1903 and those in Germany (1905) were just reaching fruition; in both countries governments and local authorities worked together on improvements. It was argued that railway traffic could benefit if low-speed heavy traffics were transferred to water.²⁸

On 13 January 1914 the WA Executive Committee met, unusually, in London, where it resolved that in areas where waterways were to be improved local authorities should make a proportionate contribution to costs. Chamberlain commented that this was now an explicit part of WA policy, and he saw this as 'another big step forward in the progress of their agitation'.²⁹ Those present included J W Gandy of Derby, Harry Boddington (of the Anderton company and North Staffordshire Chamber of Commerce), and representatives from Cannock Chase, Bristol and Gloucester.³⁰

At a meeting of the Association of Midlands Authorities on 29 January 1914, NC stressed that local contributions would reduce those sought from central government. Support came from Worcester and from Kenrick of West Bromwich, but while one alderman from Nuneaton (on the Coventry Canal) was supportive, other members were not. An interest from Solihull stated the support of agriculturalists,

but Wolverhampton insisted that it needed an outlet to London, and that the canal from Wolverhampton to Birmingham could not be improved to a 100-ton standard. NC had said that the BCN would not reach the 100 ton standard, but it could be improved so that several boats could be drawn together.³¹

A further meeting, at Bristol on 5 February, revealed that support was partly because the Corporation owned the docks; both Newport and Cardiff were keen to divert trade from the North, but while both were served by inland canals, neither sought to develop these. Elsewhere on the Severn route, Bewdley Town Council's lack of support was because the navigable Severn stopped five miles away at Stourport, although only one lock would be needed to restore navigation to Bewdley. Impey stressed that it would be for councils like that at Bewdley to approach the Board once it had been formed; Wolverhampton had also expressed dissent, on the grounds that the new waterways to the Mersey and Severn would not go through Wolverhampton itself.³²

Asquith, the Prime Minister, had indicated that some government funding might be available to implement some of the Royal Commission recommendations. The appointment of John Burns to the Board of Trade was noted favourably, and a deputation to him, rather than Asquith, was agreed.³³ This was arranged for 31 March 1914, but Burns' attitude was expressed in a Commons answer on 19 February, when the Wiltshire MP Charles Bathurst asked why no Central Waterways Board had been formed. Burns replied that since the Royal Commission proposals 'involve an expenditure of some twenty million pounds, for the direct benefit — in the first instance, at any rate — of particular districts only, and without any certain prospect of an adequate return, the Board of Trade have not yet seen their way to make any proposals on the subject'.³⁴ The deputation included MPs Terrell, Thorne, Parkes, J P L Brunner, and W Field, along with local authority representatives from Nottingham, Huddersfield, Stoke and Worcestershire, chamber of commerce representatives, and the TUC chairman.³⁵ Burns was not available, but NC and others stressed that their proposals were gradual rather than for immediate heavy expenditure, and that the first stage was to appoint a Waterways Board. It seems that Burns' response to the deputation's views was the same as the earlier one to Bathurst.

At a dinner at Gloucester on 13 February 1914, supported by Henry Terrell, Chamberlain said that it

had been put to him that he was there preaching to the converted, but 'he would do better to devote his energies to the conversion of the heathen of Liverpool and London'.³⁶ He pointed out that narrow boats would continue to be used in the collecting grounds for Birmingham, and would need to tranship at Gloucester as it was unsafe to go out onto the Bristol Channel. While it was possible to begin with the Severn line, as there were no railway interests involved, this would be much more costly if it relied on local contribution alone, and would not free the Birmingham Canal from LNWR control. Further support came from the Potteries, where Colonel Saner of the Weaver Navigation spoke in Hanley Town Hall on 22 February 1914, stressing that the railways could not carry more traffic.

The WA met on 18 March 1914 at the House of Commons, where Impey stated that 19 county councils, 60 borough councils, 77 urban district councils and 12 chambers of commerce had stated general support for the Royal Commission proposals. NC expressed satisfaction at the way the WA proposals had been received. He stressed that not all waterways would need to be modernised at once; the Board could make a study, and strengthen the 'weakest spots', so that it would only be necessary to spend £1 million to begin with. The Wolverhampton MP George Thorne thought that local authorities feared the financial commitments, and that the WA should not upset railway companies. Charles Bathurst MP stressed that they must persuade the government that they did not seek to spend a large sum at one time.³⁷

In April 1914, the WA had 130 members in its Parliamentary Committee and the support of various bodies,³⁸ including the Association of District Councils, the TUC and the Miners Federation of Great Britain. Twenty seven local authorities had agreed to make local contributions: these included Birmingham, Nottingham, Stoke-on-Trent and Worcester, and some more surprising ones — Cardiff, Huddersfield, Northampton, Bradford and Reading. The latter did not have significant involvement with waterways transport. Impey noted the promised contributions of various local authorities to the Upper Medway Navigation, and Flintshire with the Dee.

Canal closures, the Trent and mid-Scotland proposals

General principles were explored when the closure of the Wilts & Berks Canal was promoted in a Bill by Swindon Corporation. The debate on 16 July 1914

enabled MPs to oppose closure on the grounds that a central Waterway Board had not been set up. John Gretton, MP for Rutland, referred to 'a great and powerful movement which is attempting to arouse public interest in the development of the waterways of this country as they have been developed abroad'. Basil Peto, MP for Devizes, declared that the canal was one of the feeders to the Cross waterways that were proposed for development, arguing that

as long as we have no Waterways Board, and while the Report and proceedings of this expensive Commission which sat for some years are brushed aside, and the Government refuse to deal with the subject, and we have a Bill presented to the House which provides that because a railway enters a certain district the canal is consequently unnecessary, I think no better reasons could be given for rejecting this Bill or any Bill for the abandonment of any waterway in this country or the remains of any waterway until this House decides some practical steps to put us somewhere more nearly level than at present with those great industrial competitors of ours who realise the value of inland water traffic.

However, although Henry Terrell felt that 'these smaller canals should be maintained as feeders for the great canal system when it has been brought into working order', Charles Bathurst, through part of whose constituency the canal ran, conceded that the Wilts & Berks 'would not fit into a national scheme'. Royal Assent to the Bill was given on 31 July.

On 12 January 1915 the WA Executive Committee noted that Nottingham Corporation had decided to spend £150,000 on the improvement of the Trent from Newark to Nottingham. NC stated that many local authorities were willing to contribute, and proposed that the Board of Trade should be approached to produce a general Bill which would permit this.

Proceedings around the Nottingham Corporation Bill, beginning on 9 March 1915, referred to the works authorised by its 1906 Act, which had influenced standards set by the Royal Commission; these powers would expire in 1916. The Corporation had proposed to assist the Trent Navigation Company (TNC) to carry out the improvements, but found that assistance by the Development Commissioners could only be offered to public bodies. Ernest Jardine MP, who chaired the TNC, had agreed to the transfer. While in August 1914 the Development Commissioners had agreed to advance a third of the costs of improvements, on 18 November 1914 the Treasury had refused to advance the funds, as these were restricted to areas of distress, which did not include Nottingham. The Corporation then decided

to take this on, with a free transfer of the Trent. Only railway companies offered opposition.

Frank Rayner, who had been TNC engineer since 1896 and Engineer and General Manager since 1912, was on the Executive Committee of the WA, gave evidence first. He attributed the reduced profitability of the TNC to severe railway competition and the failure to modernise the Trent. Limited profits made it hard to obtain capital for improvements. Additional warehouses at Nottingham, and an enlarged depot at Leicester had been provided in the past three years, whilst an additional depot at Newark was under development. A 120-ton standard was proposed; the new locks would take three barges and a tug, as at Cromwell. Rayner pointed out that 'The Members of the Royal Commission attached very great importance to the river Trent; they made a personal inspection of it and expressed throughout the view that it was one of the most important waterways in the country, and should be one of the first to be dealt with by the Government in case any definite scheme was proceeded with on their lines'.³⁹ In 1914 there had been 20 days when lack of water had entirely stopped trade between Newark and Nottingham; 29 days when cargoes were restricted to 16/20 tons, and 21 when these were limited to 20/25 tons; the new works should prevent this. Rayner anticipated the transfer of some traffic from rail, but also that new works would be opened up near Nottingham. Citing the Ouse at York, he commented that 'I do not think that anything in the nature of what might call a ship canal could be commercially justified to Nottingham'.⁴⁰

Albert Atkey also appeared, on 10 March 1915. A member of Nottingham Corporation since 1908, he had chaired its Special Trent Navigation Committee since its formation in 1914. He was a motor engineer and South African merchant, with business in Nottingham, Derby and Leicester. Atkey recounted how in July 1914 he had gone down the Trent to Newark by launch, had twice run aground, and saw very little traffic. The Corporation had spent much on flood works and owned three miles of frontage, land whose value would be improved by navigation improvements. The Bill had been approved on 30 December 1914 by 42 votes out of 64, and a meeting of electors had approved the scheme on 11 January 1915. While the Borough of Ilkeston favoured the Bill, on 2 March a meeting of Nottingham Chamber of Commerce had opposed the takeover by the Corporation, although this had been proposed since 1885. Atkey stressed that 'it is felt that some day or

another the Government will probably take this work over, but what we feel keenly in the city is that between the lack of private enterprise on the one hand and the Government coming to our aid on the other, another twenty years may go by, and it is just the kind of work which a live municipality ought to undertake'⁴¹ It was hoped to begin work once the war was over, when there would be a surplus of labour.

Robert Hutchinson, a miller at Nottingham, and a TNC director, gave evidence that grain could come without transhipment as at Selby and York, and could be carried in bulk once the river was enlarged.

Objections defeated the proposed powers for the Corporation to act as general carriers, whilst one counsel raised a larger spectre: 'supposing it is found that they are wrong with regard to the barges of the future, and that instead of 100-ton barges the right measure of a barge is what it is on the canals of Germany where they carry 300 tons.'⁴²

The Trent proposals show some of the limits of local contributions, even with a scheme that was longstanding, a leading one and would confer clear benefits to the main locality. Plans for a Forth & Clyde Ship Canal involved schemes for a completely new canal which had strategic benefits, especially after the development of the Admiralty base at Rosyth. This went up to Cabinet level.

There was an existing Forth & Clyde Canal, but this was a barge canal owned by the Caledonian Railway Company. Since 1889 various schemes had been put forward for a Ship Canal, either along a route close to the barge canal, serving Glasgow, or a northern route at sea level, which would improve the Forth to Alloa, with a Canal across to Loch Lomond and then a new link to Loch Long. Parties had split between the northern route favoured by the Admiralty, and the Glasgow route which would bring new coal traffics.⁴³ The Royal Commission had favoured some government assistance to a commercial scheme for a new Canal, but nothing more.

The agitation for a new mid-Scotland canal partly came from Armstrong, Whitworth & Co. early in 1917, which suggested that detailed surveys should begin, although construction could not start in wartime. The Admiralty had earlier opposed a new canal, although it suggested that a route via Loch Lomond and Loch Long was possible. On 13 May 1917 the Secretary to the Admiralty recommended the Loch Lomond route on strategic grounds and for the saving of railway trucks required for coal, for oil carriage, along with improvements for the merchant marine.⁴⁴ Other

parties, notably local authorities in Glasgow, Falkirk and Edinburgh, had favoured a sea-level canal from the Forth at Grangemouth to the Clyde, and to meet this, in August 1917 Armstrong Whitworth studied a branch canal from the Loch Lomond route to Glasgow.⁴⁵ The firm then investigated the Grangemouth-Glasgow route in November 1917, and presented the whole study to the Admiralty in December 1917.

The Engineer of 30 November 1917 reported that 'the opinion is held in Glasgow that a decision to construct the canal has been reached, and that only the question of route remains to be determined'. This proved to be over-optimistic. In February 1918 the Leith Port Commissioners, perhaps threatened by the scheme, cast doubt on the commercial value of either scheme, and suggested that nothing should proceed before a public inquiry.⁴⁶ On 15 April 1918 Addison recommended further investigations of the Loch Lomond route, although the economic possibilities of a low-level canal were stressed, with the strategic usefulness paramount. Both proposed routes were at a low level.⁴⁷

Chamberlain's emphasis lay mainly on the improvement of the waterways of The Cross, and he does not seem to have considered the mid-Scotland schemes, although these continued up to the 1940s. He would probably not have favoured the Wilts & Berks, but would certainly attempt to further the Trent scheme.

Wartime to Election

The WA agitation for new English Midlands waterways was slowed down by the onset of war, and also by NC's other commitments. He became Lord Mayor of Birmingham in November 1915 and then, from December 1916 to August 1917, Director-General of National Service. He returned to Birmingham seeking a Parliamentary seat, including seeking that of Ebenezer Parkes of the WA.

Shortly after NC left the National Service post, Christopher Addison, Minister without Portfolio, proposed a committee on the future of canals, and asked NC to chair it; mooted in September 1917, this was confirmed early in November.⁴⁸ NC was unimpressed, however, and was not keen to leave his 'useful work' in Birmingham 'to preside over a Committee whose recommendations will probably be shelved'⁴⁹

Much had changed during wartime, with major disruptions in trade, between the railways controlled

by government and the independent canals that were not. The formation of the Canal Control Committee in 1917 brought everyday control into government hands. The effective subsidies involved, and the prospects for waterways once these were finally removed became a significant concern over that of the selective development of some waterways.

NC was returned as MP for Birmingham Ladywood in December 1918. Some waterways supporters, including Major Chapple in Stirlingshire, Ebenezer Parkes, Henry Terrell, Charles Bathurst and Basil Peto, left the Commons at the election, but Albert Atkey was elected M.P. for Nottingham Central.⁵⁰ Atkey was more interested in the furtherance of motoring and general trading problems in Nottingham than with waterways, but he did urge in March 1920 that the Trent Navigation works should begin.

Postwar: Election to Committee

In 1919, NC was again campaigning for canals, being interviewed by the *Daily News*, with requests for addresses about canals all over the country.⁵¹ One of his first Commons speeches, over the Ministry of Ways and Communications Bill on 13 March 1919, was made after 'lunch with Impey to discuss the Bill as it affects canals';⁵² this summed up his position:

... the canals and waterways have long been the cinderella of our transport system, and I hope the right hon. Gentleman, who in his time has played many parts, will on this occasion impersonate the fairy godmother and with his wand turn Cinderella into a princess and revivify our inland water system. But I found the right hon. Gentleman's remarks somewhat vague and somewhat slighting. He spoke, indeed, of taking the canals into his system, but he suggested that to spend £38,000,000 upon improving a property which was only valued at £6,000,000 was rather a tall order. I must agree that that is a tall order, but it is not necessary to spend £38,000,000 in order to test whether it is or is not worthwhile to improve our canals. I have never advocated, and do not advocate now, that the whole of the system known as the Cross should be improved at once. I have always thought the proper and the profitable course was to take that part which appeared to have the greatest return for the smallest expenditure of money, and having improved that, to profit by the experience gained in working it before proceeding to larger and more costly schemes.

He commended developments elsewhere, and the Royal Commission's work:

... Instead of starving and neglecting their canals, Continental countries formed a canal policy. They deliberately spent large sums of money upon the

improvement of their waterways, so that between 1870 and 1890 France alone spent upwards of £28,000,000, Belgium spent also large sums, and Germany entirely reorganised her waterway system. Again, at the beginning of the present century, all these countries returned to their old situation once more. They had then behind them the experience of what they had done, and they were so well satisfied with the result that in every single case they started new programmes; they voted again large sums of money, all of which practically had been spent at the beginning of the present War, and then once more they had started on new programmes of improvement and construction. Is it likely that all these great industrial nations went on deliberately throwing millions of pounds into a quagmire? Does it not stand to sense that if they continually renewed this policy and developed it, they did so because they found that it paid them? It was that consideration which was responsible for the appointment of the Royal Commission on Canals and Waterways in 1906. It reported in 1909 in favour of nationalisation. They regarded nationalisation in precisely the same way as the right hon. Gentleman, not as an end desirable in itself, but as a means to an end, because their investigations showed them that what had held back canals in this country was the multiplicity of ownership. ... It is perfectly hopeless to get any kind of improvement in canals without unifying the control, and the Commission felt that it was impossible to get unity of control unless you nationalised the waterways. One principal reason for that was that in almost every through route you found somewhere or other along its length a piece of canal which was either under or controlled by a railway.

He stressed the work of the Waterways Association in securing local support, including 41 local authorities, for development: 'Anyone who knows local authorities will, I think, agree that that is a very considerable achievement to get them to pledge themselves favourably upon a proposal of that kind'. He concluded that:

The House will see that, in so far as the Bill indicates an intention on the part of the Government to unify the canals and then to improve them, it is entirely in accordance with the policy which was advocated by the Royal Commission and which has since been adopted by the Waterways Association. But a new factor has arisen since the War, and that is the control of the railways by the Government. Therefore the question arises whether we should support the handing over of the canals and waterways to the railways which have been so inimical to them in the past. ... in my view there can be no possible doubt that the right system is one which puts both the railways and the canals under the same central authority. I must confess that if the poacher is going to turn gamekeeper, I am very much less afraid of him in that capacity than if he retained separate control of

the railways. I frankly admit that I am not a Free Trader in this matter. I want Protection for the canals. They are not in a position to-day to stand upon their own legs, and if the right hon. Gentleman had the railways and someone else had the canals I should feel that the canals had not a dog's chance. But if he is going to take them over and if, as I am sure he means to, he is going to give a fair chance to the canals to show what they can do, then I feel that a new era will have dawned for inland waterway navigation and I shall give my hearty support to the Bill'.⁵³

On the same day as the Ministry of Transport began work, 23 September, the new (and Britain's first) Minister of Transport, Eric Geddes, asked to meet NC.⁵⁴ 'I am very anxious to lose no time in reviewing the situation and arriving at a conclusion as to what part our England waterways are to play in the development of the country and its transportation'.⁵⁵

This meeting took place on 15 October 1919, and included Impey, 'who has the most complete and detailed knowledge of canals both here and abroad of anyone I know'.⁵⁶ Geddes stated that railway rates were about to be raised by 50%, and that capital expenditure would not be available for canal development. His Advisory Council would look at removing bottlenecks route by route, with eventual enlargement, on a betterment basis. NC stated that the most important step was to unify management and control, especially on The Cross waterways. Unlike the Canal Control Committee, this must include railway-controlled canals, as railway companies did not facilitate through traffic by water. Impey asserted that it had taken nine years to fix a through toll from the Black Country district due to obstruction by the LNWR. Citing France and Belgium, he said that without improvement canals could not take advantage of mechanical haulage. Impey advocated the building of lifts, greater productivity, and greater speed, and asserted that a new authority would soon be able to advise where the weak spots were. NC explained the position over local authority contributions, the proposed proportions, what to do about authorities that did not contribute, and how betterment could be collected through government ownership of frontages. These could be considered by the new Advisory Council.

At the opening of 1920, Impey, still WA secretary, noted the increase in railway rates, and suggested that rates by waterway might not increase by the same amount. He stressed the labour savings from larger waterways, and the reductions by haulage cost through mechanical haulage. He disagreed with the view that canals were doomed, and stated that French

waterway traffics had increased by 160% between 1880 and 1910. Carrying charges had been raised even though tolls were fixed.

In February 1920 NC wrote from the Commons that he expected to be asked to chair a committee appointed by the new Ministry to consider canals.⁵⁷ Although this proved true, it was reported that 'Eric Geddes having asked Neville to chair a committee to consider what canal improvements can be considered having regard to the country's finances but that Neville feels that it is necessary to settle Government policy on canals first'.⁵⁸ On 16 February 1920 NC asked the Parliamentary Secretary to the Minister of Transport, Arthur Neal MP, about the dangers of revised railway rates, and when the Ministry policy over canals and inland waterways would be decided. Neal replied that NC had been asked to chair the Departmental Committee. Others supported NC's concerns. These included the Bristol MP Thomas Inskip, while the Potteries MP Josiah Wedgwood asked why the Royal Commission recommendations had not been implemented; the latter was dismissed then on the grounds of cost. Others made accusations about the railway company canals. NC returned to canals in a question on 8 March 1920, where he asked whether the Minister proposed to take possession of any canals in order to raise tolls. He urged that possession take place so that tolls could be raised and subsidies end. Inskip, and the York MP John Butcher, again backed him.⁵⁹ On 22 March Chamberlain again urged the Minister to take possession of the independent canals, but Geddes replied that this should be carried out on a voluntary basis.

These activities of Chamberlain's may give the impression that he was satisfied in his role, being considered the leading figure in a longstanding campaign. Yet he wrote in early 1920 that he had 'personally never felt more depressed about politics'.⁶⁰ It seems that successes through the WA's work were only seen as minor, and, as later events suggest, NC had much more significant goals.

NC summarised his position in an article in *The Organiser* in March 1920. Reiterating the WA's aims, he stressed that the position had worsened in wartime. 'The condition of the canals has deteriorated, they are even more decayed and more silted up than before. The boats, too, are fewer in number and more in need of repair. The number of men who are capable of taking charge is smaller, while their wages are higher and their hours shorter'. He pointed out that rising labour costs would affect

waterways badly, unless waterways could take 'larger barges mechanically or electrically propelled'. While the cost of improving the Cross waterways had been put at £17m, this would now be nearer £50m.

Elsewhere, he stated that traffics were declining from pre-war levels, but that improvements could lower the costs of transport for certain goods. He urged that the Minister should take control and order repairs and dredging, and to organise through tolls. 'I am coming more and more to the opinion that we shall have to decide upon some system of public ownership, say, a scheme approximating to the Port of London Authority, or a Harbour Trust ...'⁶¹ He went on to commend the position on the Continent: 'given time and a certain amount of capital expenditure, water, for many classes of goods, can and must be considerably cheaper than traffic by the railways'.⁶²

These views were reflected in the revised aims for the WA agreed on 16 March 1920. It was stated that state control and ownership did not have to mean central government, as local or regional trusts could be appropriate. While financial restrictions were acknowledged, it was pointed out that canal carrying could be facilitated by 'the removal of a bottle neck, or the provision of facilities at some particular point, without any formidable expenditure, and attention might be given to these at once without prejudice to larger improvements which might be undertaken later'. The revised aims reflected Ministry involvement and control, and included the urging that policy over future canal ownership should be declared, to assist canal carriers immediately, and 'Generally to take all steps conducive to the better use of the canals and waterways of the Country, and to advise and assist traders in their use'.⁶³

Settling in to the House, NC planned to interview Eric Geddes and seek the nationalisation of canals, but was concerned that a single individual should have the power to decide whether or not railways should be nationalised.⁶⁴ This meeting with Geddes took place in March 1920, when NC reported that Geddes' views had changed towards Chamberlain's.⁶⁵ By 24 April Eric Geddes had agreed the terms of reference of the canals committee with NC.⁶⁶ He was also asked by Addison to chair a further committee, to enquire into living conditions on canal boats.⁶⁷ The *Carrying Trades Review* suggested that the former Committee 'is a strong one, and is getting to work with all speed; but it has a big task before it, and, we are afraid, a thankless one'.⁶⁸

Quite how thankless this would prove must be left to a further account.

Conclusion

What can be concluded about the first phase of Chamberlain's involvement with waterways development? Within 15 years of the Royal Commission's appointment, and signs of Neville Chamberlain's first interest in waterways development, a pressure group had been founded which garnered significant support from varied bodies and interests. NC had gone from being an obscure Liberal Unionist supporter from Birmingham to chairing a Departmental Committee, with some promise of action. This was against a background of limited enthusiasm and much opposition to waterways development, a major war and resource shortages, and a postwar financial crisis in transport and other industries. Chamberlain was not a lone supporter of waterways development, but he and Frank Impey (and George Cadbury junior to a lesser extent) were the constant forces in a varied movement until the later 1920s. A future article will consider the fate of the Waterways Association and its successor, the National Council for Inland Waterways.

Notes and references

Much has been drawn from the Chamberlain Papers held by the University of Birmingham Special Collections Department, which include many private letters and press cuttings; these are recorded as 'CP' below. Local Press sources have been drawn partly from the online source The British Newspaper Archive.

1. David Dilks, *Neville Chamberlain: Pioneering and Reform, 1869-1929*, Cambridge University Press, Cambridge, 1984, p.287
2. unidentified newspaper, 26 October 1911 (NC collection)
3. Nick Smart, *Neville Chamberlain*, Routledge, Abingdon, 2010, p.30, stressed that he went around the whole factory 'and filled several notebooks with his observations'
4. Frank Impey, *Inland Waterways*, *Birmingham Gazette & Express*, 30 November 1911
5. Smart, p.41
6. *Birmingham Daily Post*, 11 December 1913
7. Gordon Cherry, *Town Planning in Britain Since 1900: the Rise and Fall of the Planning Ideal*, Blackwell, Oxford, 1996
8. *Birmingham Daily Post*, 21 January 1887; *Bristol*

- Mercury*, 19 February 1886; Frank Impey, *Birmingham and Bristol Channel Improved Navigation. A prospectus*, 1887; *The British Architect*, 15 July 1887
9. Sir Ebenezer Parkes (1848-1919) was Liberal Unionist M.P. for Birmingham Central from 1895 to 1918
 10. *The Times*, 15 July 1912; Waterways Association, *Report of the Executive Committee to the Association*, May 1913
 11. Waterways Association, pp.2-3
 12. *The Times*, 13 December 1912
 13. *Financial Times*, 23 May 1913
 14. *Financial Times*, 7 June 1913. Henry Terrell (1856-1944) was Conservative MP for Gloucester between 1910 and 1918, and a Sharpness New Docks Company director (*Cheltenham Chronicle*, 16 May 1914)
 15. Waterways Association, *Report of the Executive Committee to the Association*, May 1913
 16. Waterways Association, p.6
 17. 21 June 1913
 18. Sir William Howell Davies (1851-1932), MP for Bristol South from 1906 to 1922, does not seem to have made many Commons comments on waterways
 19. *Birmingham Daily Post*, 19 July 1913
 20. *Birmingham Daily Post*, 20 September 1913, 22 September 1913, 30 September 1913; 22 October 1913; *The Times*, 29 September 1913. George Cadbury junior (1878-1954), director of the Cadbury Brothers chocolate firm with waterside premises in Bournville, would support the Severn development until nationalization. His cousin and fellow director, William A Cadbury (1867-1957) would become Lord Mayor of Birmingham in 1919
 21. *Morning Post*, 24 Oct 1913. Danson Cunningham (1841-1915) was a Liverpool cotton broker who made many suggestions for improvements to traffic from the Liverpool docks, including special motor roads
 22. *Morning Post*, 25 October 1913
 23. *ibid.*
 24. *Birmingham Daily Post*, 13 November 1913
 25. *Morning Post*, 29 October 1913
 26. *Birmingham Daily Post*, 12 November 1913; *Lichfield Mercury*, 21 January 1913. Albert Stanley (1863-1915) was MP for North West Staffordshire from 1907 to 1915
 27. *Sheffield Daily Telegraph*, 14 November 1913
 28. *The Times*, 14 January 1914
 29. *ibid.*
 30. *Birmingham Daily Post*, 14 March 1914
 31. *Birmingham Daily Post*, 30 January 1914
 32. *Birmingham Daily Post*, 4 February 1914
 33. *The Times*, 13 February 1914
 34. *The Times*, 28 March 1914; Hansard, 19 February 1914
 35. *Manchester Courier*, 1 April 1914
 36. *Gloucester Journal*, February 14 1914
 37. Sir Charles Bathurst MP (1867-1958) was Conservative MP for Wiltshire Wilton between 1910 and 1918, but his home was at Lydney on the banks of the Severn, which may explain his interest in development. George R Thorne (1853-1929) was Liberal MP for Wolverhampton East between 1907 and 1929
 38. *The Times*, 10 April 1914
 39. page 9, Frank Rayner evidence
 40. *ibid*, p.15
 41. *ibid*, p.79
 42. Balfour Browne, 12 March 1915
 43. Edwin A Pratt, *Scottish Canals and Waterways*, Selwyn & Blount Ltd, London, 1922
 44. Cabinet papers, CAB/24/15
 45. CAB/24/28
 46. *The Engineer*, 1 March 1918
 47. CAB/24/48
 48. CP, 10-17 September 1917, 10 November 1917
 49. CP, 16 February 1918
 50. Atkey (1867-1947) would be Conservative MP for Nottingham before losing his seat in 1922
 51. CP, 19 January 1919
 52. CP, 11 March 1919
 53. Hansard, 13 March 1919
 54. Eric Geddes (1875-1937) was Minister of Transport from 1919 to 1921; in 1919, he supported significant state control over transport. See Keith Grieves, *Sir Eric Geddes: business and government in war and peace*, Manchester University Press, Manchester, 1989, especially Chapter 6
 55. CP, NC 8/2/10
 56. CP, 25 September 1919. CP, 8/2/15; NC 8/2/16
 57. CP, 11 February 1920

continued on page 51

The Viaducts and Tunnels of the Whitby–Loftus Line

Michael Aufrere Williams

The Whitby to Loftus line, opened on 3 December 1883, was a little more than sixteen miles in length, from Bog Hall Junction (26 chains from Whitby station) to an end-on connection with the North Eastern Railway at Loftus.

The Whitby, Redcar & Middlesbrough Union Railway was incorporated on 16 July 1866.² The maps for the proposed line are much the same as those for that abortive venture in 1864. From Kettleness to Loftus the line is in the same position as it was upon

completion in 1883, but (as in the 1864) maps, there is little indication of any tunnelling or bridging between Sandsend and Kettleness (the map ignoring the topographical problems completely), while the line between (the future site of) Whitby West Cliff station and Sandsend ran further inland than the final construction. The estimate for the proposed line gives the total cost as being £235,278 (a vast underestimation as it later turned out) with £66,100 being earmarked for 'tunnel and viaducts'. It is unfortunate that the two were not separated in the estimate but it is known from later costs that tunnelling was far more expensive than the overall costs of the viaducts. The line in its entirety

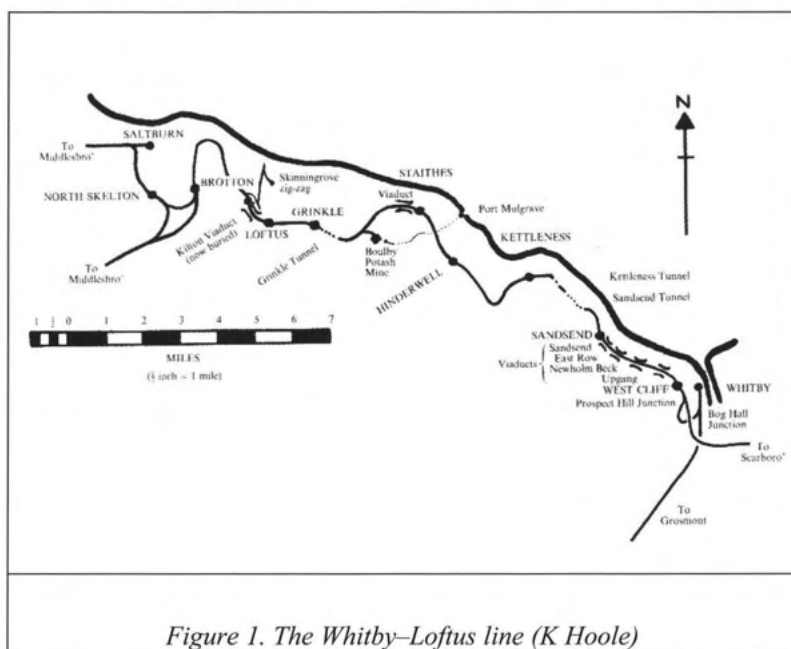


Figure 1. The Whitby–Loftus line (K Hoole)

The first proposal, in 1863, for a line along the coast northwards from Whitby was that of the Scarborough, Whitby & Staithes Railway. According to the map the line between Whitby and Sandsend would have been built a little further inland than was ultimately the case. Between Sandsend and Kettleness the course was more or less similar to that which was eventually built, although the map and the plans give no indication of any tunnelling or, indeed, any cliff-edge work. From Kettleness to Hinderswell the line would have taken a route close to the sea and Runswick village than was eventually constructed. The route on the plan appears to have been rather carelessly drawn, giving little indication of any engineering difficulties (like tunnels and viaducts) that might arise.¹ It was rejected in 1864 by committee in the House of Commons.

cost £655,077 at £40,942 per mile and was very difficult to construct. Although Parliamentary approval for construction of the line was granted in 1866, the first sod was not cut until 25 May 1871, with John Dickson as main contractor. In all likelihood this hiatus was caused primarily by the difficulties the company had in raising sufficient funds. The terrain upon which the line had to be built included ravines of post-glacial streams; the valley sides of which were steep and often unsuited to railway construction except with the use of heavy and expensive engineering works.³ This terrain, and the difficulties involved in bridging it, are clearly shown in the photographs of the viaducts, while operating costs were heavy, owing to the nature of the terrain and the continuing maintenance needed on the three tunnels and five viaducts along the short 16 mile line.⁴

The viaducts

The first of the viaducts in the direction of Loftus from Whitby was at Upgang, about two miles from the commencement of the line at Bog Hall Junction. While there are many photographs of the other four viaducts on the line, those showing Upgang viaduct are hard to come by.⁵ A little further along the line was Newholm viaduct.

Within half a mile of Newholm was Eastrow viaduct. Shortly afterwards the trains passed over Sandsend viaduct, and the last on the line, the *pièce de résistance*, was at Staithes (see Figure 6).



Figure 2: Newholm Viaduct (K Hoole)



Figure 3: Sandsend Viaduct (J S Gilks)

The design of the viaducts⁶

There was a pleasing, if stark, simplicity in the design which was immediately apparent to all those who saw the viaducts while they existed. *The Engineer* remarked that there was no special novelty in the superstructure, where spans of 60 feet had been adopted. Well-designed lattice girders were thoroughly braced together and these were stiffened laterally by elaborate wind ties were surmounted by cross iron joists which in turn supported a timber platform 14 feet wide, on which the single line of rails

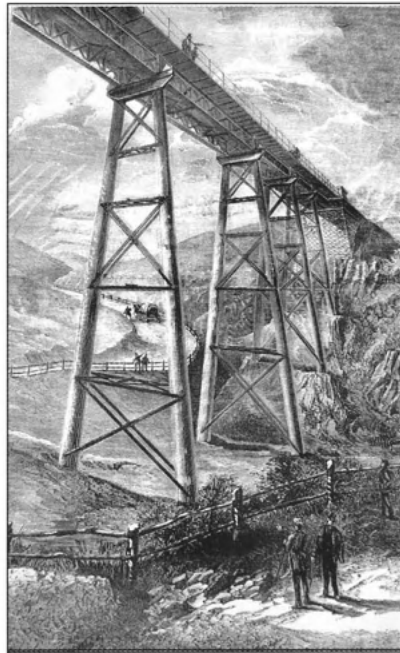


Figure 4: Upgang Viaduct
(The Engineer, 14 March 1873)

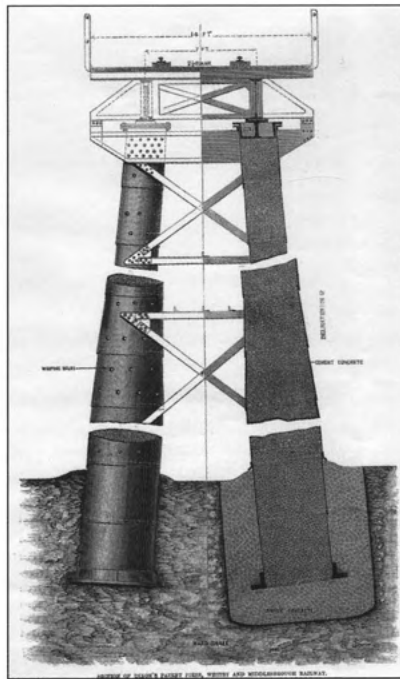


Figure 5: Upgang Viaduct, section
(The Engineer, 14 March 1873)

was laid. Because the ravines upon which they were built had at their base shallow streams, there was an equal simplicity in the way in which the foundations of the piers were constructed. The ground was sufficiently solid merely to dig a hole into which the cast iron bed-plate forming the base of the piers was firmly embedded in a mass of concrete. The piers were constructed of wrought iron and *The Engineer* seemed very approving of Dixon's idea to fill the piers with cement and concrete, which thus would keep the external skin in shape and dispense with all internal stiffening. 'For the sake of concession to popular prejudice more than anything else', continued the contributor of the article,

each pier was equal to a safe load of three hundred tons, more than double that which is theoretically required.

Thus the load was not borne by the iron at all, 'the real duty of which is to hold the concrete column in shape'. The weight of the column therefore was considerable so the diameter was increased towards the bottom by successive offsets from 2ft 6in to 3ft 6in and 4ft 6in which, for ease of construction, is much preferred to a gradually tapering tube. Finally, weeping holes were punched in the plates at every foot to allow drainage of any excess moisture in the setting of the concrete and each pair of columns is stiffened by diagonal and cross bracing attached to the iron skin of the pier at points duly stiffened to receive it.

As will be noted shortly, it was not the design that was at fault, but the casual and slack nature of the erection of the viaducts which was to cause so much trouble before the final opening of the line on 3 December 1883.

The construction of the viaducts

The viaducts were manufactured at the Skerne Ironworks, Darlington which enjoyed a chequered career: opened in 1864, it closed in 1875 and reopened twice, in 1876-79 and 1880-82. The designer of the viaducts was John Dixon (not to be confused, as has happened, with the main contractor John Dickson).⁷ The contracts (or 'articles of agreement') were made on 1 December 1871 and 25 January 1873. The price for the erection of the five viaducts along the line was £23,452. *The Engineer* of 14 March 1873 reported 'We have noted with considerable interest the series of viaducts on the new Whitby, Redcar and Middlesbrough railway, constructed for the company by Mr. John Dixon from his own designs but under the superintendence of Mr. J. H. Tolmé, the engineer.'⁸

Fortunately, evidence is plentiful for the history of the railway and its viaducts between the years 1871-1889.⁹ There are three key sources for the early history of the viaducts with special reference to their cost, the dates of their erection on the line, and the problems they caused before the line could be opened.¹⁰ Arguably the central text is that of a memorandum written in 1883 by T E Harrison, Engineer-in-Chief of the North Eastern Railway, which was deeply critical of their design and construction. The very few historians who have consulted the primary sources accept it at face value; the present historian on the whole agrees with that acceptance.

The viaducts were in place very early in the line's construction. Unfortunately the contract between Dickson and Dixon has not survived; however, it would have been sensible, and not unusual, to bind Dixon to early completion in order to allow Dickson access along the line. The reports of the Engineer, Tolmé, while not always reliable, provide what seems to be a fairly accurate timeline. His report to the directors on 9 May 1872 (less than a year after the first sod had been cut) informs them that (between Whitby and Sandsend) 'The only heavy work on the section consists of three viaducts, the masonry for which is fast approaching completion and the iron superstructure is now in course of delivery'. On 9 September 1872 Tolmé reported 'One iron viaduct on this length (the first seven miles from Whitby) is finished, and two other iron viaducts and two short timber ones are in the course of construction'. The timber viaducts mentioned are of interest for they were to be built on what soon became the abandoned

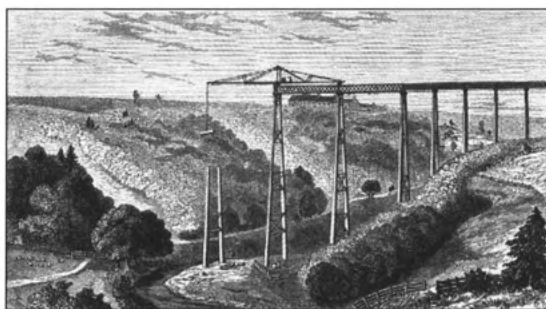


Figure 6: Staithes Viaduct under construction

stretch of line around the cliffs between Sandsend and Kettleness.¹¹

The next five months were productive for, on 21 February 1873 *The Engineer* reported 'The whole of

the iron viaducts are now completed, with the exception of the one at Staithes, which is, however, in course of erection.' That this was the case is shown by a most important source, unused by any other history of the line, which not only gives technical details of the viaducts themselves (see below pp. 10-11 check) but includes a vivid and dramatic illustration of Upgang viaduct which, at the time of the publication of the article, can only just have been completed.¹² However, clouds on the horizon were beginning to darken. The directors' minutes for 11 July 1873 record that 'much discussion took place on the condition and progress of the works and especially with reference to the iron viaducts and the tunnel.'¹³

The building of the Upgang viaduct was successful for, in his next report of 1 September 1873, Tolmé reported that 'One of the piers of the Upgang viaduct, over which trains have been running some time, has been recently weighted with double the maximum working load (viz. 180 tons) and had stood the test in the most satisfactory manner, there being no signs of defect or failure in the slightest degree.'¹⁴ Things were not going entirely smoothly elsewhere for Tolmé reported on the same date 'The work at Staithes viaduct has been almost suspended the last few months pending some slight modifications in the designs of the larger spans. These are now settled, and the work will be proceeded with.'¹⁵ Unfortunately, time was running out for Tolmé and Dickson for, according to the original contract, the line was to be completed within two years 'by midsummer 1873' and by September 1873 that time had passed. In December 1873 Dickson was sacked, and by late 1874 the same fate had overtaken Tolmé.

There are two likely reasons for this state of affairs: firstly, the poor quality of work produced by Dickson of which the Harrison memorandum provides the most compelling evidence and, secondly, the impoverished state of the company's finances. That these finances were in a very distressed state is made clear in a very important document: a long letter dated 5 May 1874 from Arthur Hamand who had, from May 1872, become joint Engineer with Tolmé. Hamand was clearly unhappy with the company and, indeed, while co-signatory with Tolmé to the half-yearly Engineers' Report to the shareholders of 31 March 1874, does not appear on such a document again, indicating his resignation or dismissal (neither of which are mentioned in the minutes of the directors' meetings). In this letter he is severely critical of the company's financial situation, making clear that the company's

penny-pinching has considerably exacerbated the problems in completing the line.¹⁶

The sacking of Dickson caused problems for John Dixon, especially as his contracts for the building of the viaducts had been made with the former. Dixon wrote to the Board of the Whitby company on 9 January 1874 stating that 'I am now prepared to complete the viaducts according to my agreement with your late contractor John Dickson for the sum of £3152, being the balance as shown by you, due to me.' He went on to say that the real balance was actually £5252 'a portion of which has been retained by you in the shape of retentions according to your agreement with him ...'¹⁷ These figures indicate that, by early 1874 almost three quarters of the viaduct work had been completed. The Board seemed to acquiesce with Dixon's demands; the minutes of the directors' meeting of 9 February 1874 note that 'The correspondence and arrangements made with Mr. Dixon for the completion of the iron bridges were read and confirmed.'¹⁸

In order for Dixon to be paid, the Engineer had to issue a certificate which had the effect, among other things, of authorising payments to contractors. By March 1874 Dixon was becoming impatient for payment and on the 26th wrote to the Board asking for £1500. He complained that he had had no certificate since the previous July '... why the Engineer should not issue one regularly every month I cannot understand as it is stipulated for in the contract ... the work has been going on continuously'. Nothing happened. John Dixon finally lost patience and on 8 May 1874 sent a very tart letter indeed to the Board, demanding that 'your engineer be instructed to do his duty'. It was now nearly a year since he (Dixon) had received a certificate although 'I have steadily kept on with the works and I think I am entitled to have consideration'. It is apparent, then, from these letters that although the rest of the work on the line had ceased, work on the viaducts was still continuing.¹⁹ This is confirmed by Tolmé's last report in that he wrote '... the viaducts on the line have been steadily progressing and are now nearly completed.'²⁰ What is also apparent is that the Board of the company was in some disarray, caused most likely by the lack of funds.

By now negotiations with the NER to take over the construction of the line were pending. However, it was not until a year later, after the agreement with the NER, that Dixon's demands began to be met. The minutes of the directors' meeting of 20 July 1875

confirm that ‘... a cheque for £2000 be paid him’, while the minutes of the next meeting, held on 27 August, include the resolution that ‘... a further £1000 on account of his contract sum of £3152 be authorised’. Even so, Dixon was not satisfied. The matter dragged on for a further three years until, in September 1878, the minutes of the directors’ meeting of the 13th declare that ‘... Mr. Dixon’s claim had been settled for £4500 of the Company’s stock transferred to him’.²¹ By 1889, however, this stock had become almost worthless. Nevertheless the viaducts were completed and, to all intents and purposes, John Dixon had (ultimately) been paid.

Before moving to a discussion of the problems presented by the viaducts in the early 1880s, the cost of their construction must be considered. The main source for their cost is the Engineer’s Reports of 1872 and 1873. These reports give (usually at monthly intervals) the amount of moneys spent on various aspects of the line. The costs seem to be cumulative (annually). Thus for 1872 the amount spent on the viaducts was £5650, while in 1873 the amount spent was £7500. In today’s money the amount spent on the viaducts in these years is approximately £600,000. These figures are important, for they partly explain why a deviation proposed in 1875 was not taken up. Briefly, this plan was to abandon the section between Sandsend and Kettleness and to construct a deviation inland from Whitby (West Cliff) to Hinderwell. It is possible that it came to nothing because the viaducts would have been rendered redundant and the money spent upon them wasted.²²

Delivery of the various components of the viaducts

As has been noted above, the viaducts were in place quite early. An interesting question arises: how were they delivered? Manufactured at Darlington, the various parts of the viaducts could have been delivered either by rail or by sea. Similar viaducts, with larger spans, were commonly manufactured at that time in works like Skerne’s, assembled with temporary bolts at the works, dismantled, sent in smaller pieces to sites and re-assembled and riveted at the site. If this is the case, then the parts could have been transported by rail to Whitby and then moved by road to the four viaduct sites between Whitby and Sandsend. It is, of course, possible that component parts of the viaduct were small enough for them to have been sent by sea and offloaded by the following method. The well-known photographer



Figure 7: unloading coal on the beach at Sandsend c1880 (Whitby Lit. & Phil.)

Frank Meadow Sutcliffe in about 1887 took a picture of a boat unloading heavy material (coal) on to Sandsend beach, from where it was moved to horse and cart.

Although the process seems arduous, it *may* have been the method of transportation for the component parts of the four viaducts, for they all lay very close indeed to the beach where, as seen above, it was possible to ground a boat at low tide. Staithes viaduct, by far the largest of the five, presents a more difficult problem. No material could have been transported from Whitby (Deepgrove tunnel not being completed before 1882) and the nearest railhead was at Loftus five miles away; the Staithes-Loftus section of the line was as problematic as the cliff top section between Sandsend and Kettleness and not completed until July 1878. How, then, was the heavy material transported to Staithes? It can only have been by sea. There was — and still is — a small harbour at Staithes where it might have been possible for ships, carrying the heavy structures, depending upon their size, from Teesside to have landed. While quite a haul through the steep, narrow streets of the village it was not far to the site. A unique visual representation of the construction of Staithes viaduct may be found in a contemporary text. The illustration shows the viaduct being constructed from the southern side of the valley. The piece being manoeuvred into position by the crane seems small enough to have been able to be carried by ship to Staithes.²³ Lacking any primary sources on the matter one can only conjecture, but, using the principles of Occam’s Razor, the sea route seems the simplest method of transportation.

Problems

After the takeover of construction of the line in 1875 it took over three years to remedy the defects in almost every area of construction. Then, when things were beginning to improve, the Tay Bridge disaster occurred, leading to, *inter alia*, far greater safety demands on newly built bridges and viaducts. Firstly, in July 1881 a new set of requirements was issued by the Board of Trade which required that the viaducts should be equal to withstanding a wind pressure of 56lb to the foot. The viaducts as built were only calculated to withstand a wind pressure of 28lb to the foot. Secondly, a further regulation was made to the following effect: 'If in iron viaducts the main girders are placed below the level of the rails substantial parapets about 4ft 6in in height must be provided, and as a further protection substantial guards should be fixed outside, above the level and as close to the rails as possible ...'²⁴ These demands were complied with, but the work was heavy and the cost considerable. Nevertheless by October 1882 the usual notice for inspecting the works with a view to opening the railway was given, and the works were inspected by the Government Inspector, his inspection on that occasion confined to the viaducts, for finding he could not pass them he deferred further inspection on the rest of the line. Far greater detail, however, of this inspection may be gained from the Harrison memorandum. It will be recalled that the designer's plan was to fill the piers with cement and concrete, but, wrote Harrison, 'The Inspector required that in the iron casing of the piers of the Staithes viaduct, holes should be cut in them to ascertain the condition of the concrete with which they were filled, the result being that in the first trial place the concrete was found to be mere gravel without any cement, and with the same result, though not so bad, in several other cases.' This was clearly a disaster, and perhaps argues more forcefully than any other evidence that the quality of the construction of the line under Dickson and Tolmé was appalling, leading Harrison to remark that 'It has been asked how it occurred that the Engineer-in-Chief had not discovered these defects before. The answer is simply that he did not believe that such scamping of work could take place with even reasonable inspection, and such a case had never come to his knowledge before.' More detailed inspection at this time revealed that several of the piers were not perpendicular, in one case to the extent of seven inches, in others to the extent of three or four inches, and this applied more or less to all the viaducts. It was clear that the piers on the tallest viaducts,

Staithes and Uppang, had already begun to buckle and remedial work in the form of two rows of longitudinal bracing was necessary. Two rows were, in the end, added to Staithes viaduct and one to Uppang viaduct. The representation of Uppang viaduct in *The Engineer* article of March 1873 (Fig.4) shows the newly constructed viaduct without such bracing. As well as this, Harrison remarked that upon taking control of the construction in 1875 the roadway for the permanent way on all the viaducts was exceptionally flimsy and all had to be replaced. Specifically, this 'roadway' was in the words of *The Engineer* article, 'a timber platform fourteen feet wide, on which the single line of rails was laid.'

When this state of the work was discovered it was, understandably, not thought desirable that any formal report should be made by the Government inspector. Next, it was arranged that steps should be taken for a complete examination of every pier in each viaduct with reference to the concrete, and each pier that was out of perpendicular was with great difficulty straightened. No time was lost in remedying these defects and by aid of a machine designed for the purpose liquid cement was forced into every pier.²⁵

It is interesting to note that the inspector was Major General Charles Scrope Hutchinson who in 1878 had inspected — and recommended for opening — the Tay Bridge. According to John Prebble, Hutchinson was 'a stiff, scrupulous, exacting man, who had a sharp eye for the inconsequential detail', and who had only just escaped 'the blame, the anger and the mob-hatred suffered by Thomas Bouch'.²⁶ The terrible disaster cannot have been very far from Hutchinson's mind when undertaking later inspections and thus it is likely that he would have made the very highest demands to ensure future safety when inspecting the Whitby-Loftus line. Indeed, after the first inspection in July 1883 Hutchinson concluded severely that 'I cannot recommend that the opening of the line should be sanctioned and I must report that by reason of the incompleteness of the works, it cannot be opened without danger to the public using it'. Although not saying so specifically, it was the viaducts which caused Hutchinson the most concern. He made twelve requirements to be fulfilled before the line could be opened. Two of these concerned the viaducts: firstly at Staithes viaduct where the longitudinal bracing had to be extended for three spans and the ranging of the girders should be as far as possible improved; and secondly, that in all the viaducts the condition of the concrete required

careful examination, and means taken to improve it where defective. Not everything was bad, though, for Hutchinson concluded that ‘as regards vibration and oscillation, the viaducts now behave well with heavy engines passing over them at speed.’²⁷ A second inspection followed shortly afterwards, with Major (later Colonel Sir) Francis Arthur Marindin reporting on 22 August 1883. But, once again,

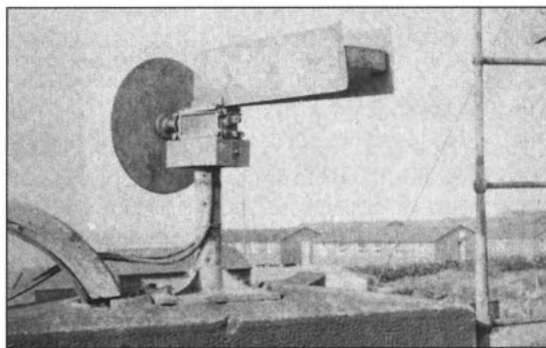


*Figure 8: Major (later Colonel Sir)
F A Marindin*

permission to open the line was deferred; the cause, again, was the defective condition of the viaducts. Indeed, it was clear that the second demand of the previous inspection had not been fulfilled. Major Marindin wrote

With regard to [the second] requirement [of the previous inspection], the concrete filling of most of the piers has been found to be very defective and four of the columns in each of the five viaducts were selected by Maj. Gen. Hutchinson to be dealt with in a manner arranged by him with the Engineer. I examined these columns carefully and I found that, so far as can be judged by sound from tapping the iron casing of the columns, and by inspection at the peep holes and other holes which have been made in the casing, the concrete has now been made good, all the hollow places having been filled up with cement grouting. Orders have been given to continue this work on all the columns, but until all have been satisfactorily healed in the same manner as those which I have tested, I cannot recommend that the opening of this line should be sanctioned and I must report that by reason of the incompleteness of the works, it cannot be opened without danger to the public using it.²⁸

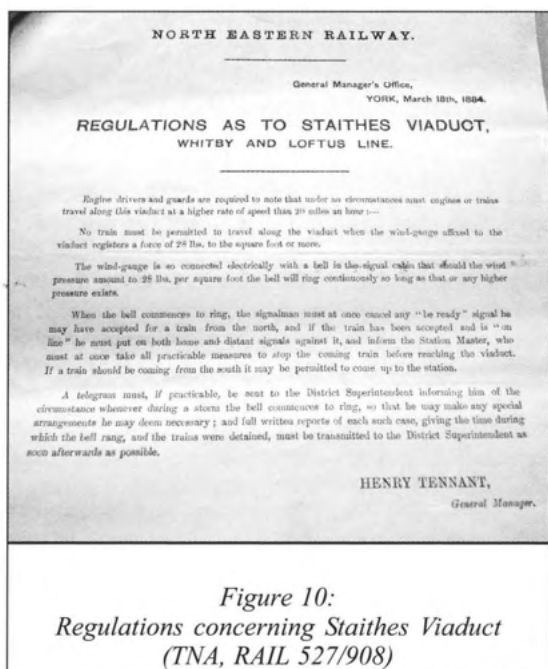
However, at last and two and a half years late, the line was approved by the Railway Inspectorate of the Board of Trade. In the final report, made by Maj. Gen. Hutchinson on 3 November 1883, he gave permission that the line be opened, but it was apparent that he considered that the viaducts still had the capacity to cause problems. On each viaduct the maximum speed allowed was 20 mph. Since Major Marindin’s report he found that the concrete in the columns of the viaducts has been carefully gone over, and its defects made good, except in three places in Numbers 5, 6, and 8 piers at Staithes, which were to be attended to at once. He made a number of further demands, firstly that the viaducts be carefully maintained particularly as regards the bracing, both longitudinal and transverse. Secondly, that no time should be lost in painting those portions of wrought iron girders which had not yet been recently painted (this was an ongoing task throughout the line’s history). But by far the most unusual demand was that, at Staithes, because of its height and exposure to easterly gales, a wind gauge should be placed in a suitable position, in charge of the Staithes station master, and that no train should be allowed to cross the viaduct when the wind registers a force of 28lb to the square foot or more.²⁹



*Figure 9: Staithes Viaduct wind gauge
(J W Armstrong Trust). This is now in the
National Rail Museum, York*

Extremely detailed instructions were issued by the NER three months after the opening of the line concerning the operation of the railway in windy conditions.

Anecdotal evidence suggests that these instructions may, in later days, have been honoured more in the breach than the observance, owing to the inadequacies of the gauge.³⁰ No doubt there were sighs of relief in both the NER and WR&MUR



boardrooms but, as Harrison reminded them just after the opening of the line, ‘the amount spent in putting the viaducts alone into a proper state exceeded £30,000, but for the work to the viaducts the line would have been completed nearly 18 months earlier.’³¹

The life of the viaducts

In the Board of Trade inspector’s report of July 1883 Maj. Gen. Hutchinson went into considerable detail when discussing the dimensions of the five viaducts. There was considerable variation in their height and length.³²

The line opened, beginning its 75-year life quietly.³³

	height(ft)	max. span(ft)	girder type	length(ft)
Upgang	70	60	lattice	330
Newholm	50	30	plate	330
Eastrow	30	60	lattice (6 spans); plate (2 spans)	528
Sandsend	63	36	plate	268
Staithes	152	60	Warren (6 spans); plate (11 spans)	790

Table 1: dimensions of the viaducts

As for the viaducts, they initially gave no problems but, by 1895 (only 12 years after its opening) the lattice girders at Upgang viaduct required

strengthening and at Eastrow viaduct complete replacement (owing to corrosion, the viaduct being built actually on the beach and within 35 feet of the sea at high tide). Certain struts on Upgang viaduct had buckled considerably and needed urgent attention while at Eastrow it was decided to replace the lattice girders with new steel girders. The contractors were the Cleveland Bridge & Engineering Company of Darlington. The contract for the Upgang viaduct was entered into on 6 December 1893 and the work finished by 30 August 1894; the contract for the Eastrow viaduct was entered into on 9 May 1895 and the work was finished by 31 October 1895. The cost of the work reflected the seriousness of the nature of the problems: repairs at Upgang cost £714, while those at Eastrow cost £2682 14s 9d.³⁴ The viaducts were regularly painted and maintained subsequently and gave no further problems.

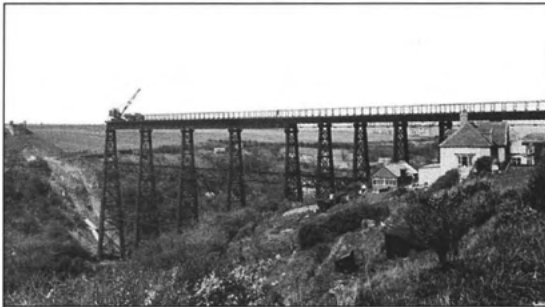
History is silent concerning the viaducts until the announcement by British Railways in September 1957 that the line would be closed, stating that the main reason for closure was the uneconomic nature of the line and that £57,000 would be required for maintenance of the tunnels and viaducts over the next five years. Despite a rearguard action being fought by the Whitby Urban District Council under the leadership of the Clerk, J B McClurg, the line closed to all traffic on 5 May 1958, the last train running on 3 May 1958.³⁵

Demolition and destruction

Two years after the closure of the line demolition of these remarkable structures began. There is considerable photographic evidence for this process. Perhaps it is instructive to contemplate the ease and brutality of their destruction with the difficulties

involved with their construction. Indeed, the second prospectus issued by the WR&MUR described the Staithes viaduct as ‘noble’.

Unfortunately, it has not been possible to locate any photographs of Upgang viaduct in process of demolition. The viaducts were cut up for scrap.



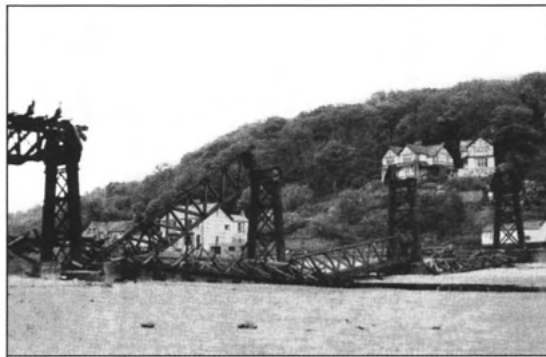
*Figure 11: demolition of Staithes Viaduct [1]
(British Rail)*



*Figure 12: demolition of Staithes Viaduct [2]
(British Rail)*



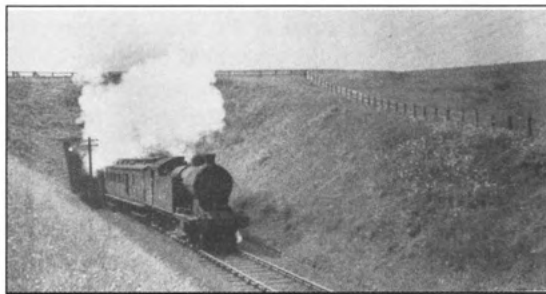
*Figure 13: demolition of Sandsend Viaduct
(K Hoole)*



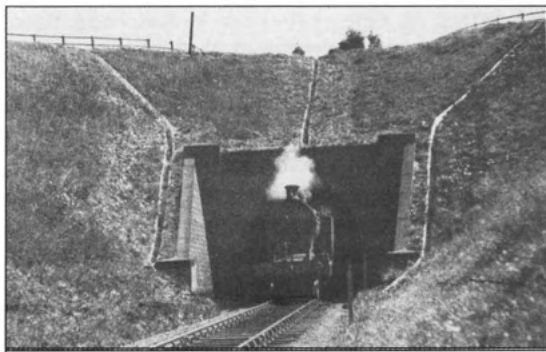
*Figure 14: demolition of Eastrow Viaduct
(K Hoole)*

The tunnels

As finally built there were three tunnels on the 16-mile line between Whitby and Loftus. These were the Deepgrove (or Sandsend), the Kettleness and the Grinkle (originally Easington) tunnels.



*Figure 15: Kettleness Tunnel, north portal
(C C Cobb)*



*Figure 16: Grinkle Tunnel, north portal
(D Ibbotson)*

The longest was Deepgrove tunnel (1649 yards [1508 m]). The tunnel is, for the most part, straight; however, there is a curve to the north for the last 300 yards. Kettleness tunnel was 308 yards [282 m] long and Grinkle tunnel was 990 yards long [905 m].

However, the only tunnel authorized in the original 1866 Act was the Easington, which was then to be 1324 yards long. When work on the line began on 25 May 1871, progress was satisfactory along some sections of the line, but the Engineer's Report presented to the directors at their meeting of 9 May 1872 stated baldly that on the Easington tunnel to Loftus section 'Nothing has been done. Machinery there, then found the tunnel could be halved by a slight deviation. Careful examination of the ground satisfies us that we shall not meet with any extraordinary difficulty in the execution of the tunnel.'³⁶ The Engineer, Tolmé, was often given to exaggeration and prone to telling the directors what he thought they wanted to hear. His forecast concerning the future construction of the Grinkle (Easington) tunnel will, as will be shown, be incorrect. The tunnel was shortened, though, for Tolmé's report of 9 September 1872 mentions that, after arrangements with the landowners, the tunnel has been shortened from nearly a mile in length to considerably under half a mile (792 yards).³⁷ This deviation, along with other changes to the 1866 plans, led the directors at a meeting on 12 October 1872 to note that 'it is desirable that parliamentary sanction should be obtained to the deviations which have been necessary in carrying out the works upon the railway'.³⁸ At the directors' meeting of 11 February 1873 they 'resolved that the Bill now submitted for authorizing the diversion and alteration of the line and levels of the WR&MUR and for other purposes be and the same is hereby approved'.³⁹ It is interesting to note that work had already been undertaken on these alterations, the main ones being bringing the line closer to the sea between West Cliff and Sandsend and the tunnelling changes at Grinkle and along the cliff face between Sandsend and Kettleness. Thus the 1873 Deviation Act was passed.⁴⁰ The plans issued with it clearly show the new length of tunnel at Grinkle and six new ones proposed between Sandsend and Kettleness.⁴¹ However, there is no mention of any moneys spent on tunnelling until the twenty-first Engineer's certificate presented to the 4 April 1873 meeting of the directors where it was noted that £1000 had been spent on tunnelling.⁴² This must have been on the Sandsend-Kettleness section where, Tolmé reported

to the directors on 1 September 1873 'the headings for the short tunnels through the jutting points of the cliff are nearly all driven.' Unfortunately, in the same report, Tolmé had some bad news concerning the Grinkle tunnel: 'A slip which took place in the embankment at the southern end of the Easington tunnel has caused a great deal of trouble and delay ... A bed of quicksand was also met with in the tunnel heading, which considerably retarded the work ...'⁴³

Without any doubt at all, the decision to initially construct the line *around* the cliffs between Sandsend and Kettleness was not only a major mistake, but the cause of the line's failure. Nevertheless a considerable amount of work was done on the various tunnels as is indicated by Tolmé's last engineer's certificate, of 20 October, 1873. He reports there that, so far, £4681 had been spent on the various tunnels. The problems caused by the cliff edge works as well as those at Grinkle tunnel brought the company to the edge of bankruptcy, and resulted in the sacking of the contractor, John Dickson at the end of 1873 and of the Engineer a few months later. It is impossible now to know how much work was actually done (no earthworks of any kind remain on the cliff edge section). However, a more recent historical Ordnance Survey map (before 1923)



Figure 17: Ordnance Survey map (pre-1923) showing 'Old Tunnel' at Keldhowe Point. The darker line indicates the abandoned section; the lighter, straight line as finally constructed

shows a tunnel at Keldhowe Point on the abandoned section of the line. There is no evidence for the existence of this tunnel other than the map. However, even the major tunnelling works which eventually took place further inland did not lessen the cost.

By the summer of 1874 the company was in considerable financial difficulty. Creditors were

threatening to take legal proceedings against the company; horses and locomotives belonging to the company were sold at auction; complaints from members of the public regarding damage caused by the company and letters from disgruntled shareholders were arriving regularly; attempts to attract further investment failed dismally⁴⁴ and by 12 November 1874 the company's bank account stood at £963 15s 6d [£44,054] (and this only after the better of the two locomotives had sold for £750).⁴⁵ The contractor had been sacked, and work on the line had ground to a complete halt. There was only one option open to the directors if the line was to be completed: an agreement with the North Eastern Railway. On 12 November 1874 the directors met to consider a letter they had received from C N Wilkinson, the Secretary of the NER, dated 23 October 1874 in reply to the WR&MUR's directors' wish to open negotiations with the NER for taking over the construction of the line. At this moment the NER's reply was cautious:

Dear Sir Harwood,

the representations which have been made as to the present position of the WRMURly have occupied the attention of the North Eastern Board and the decision that they have arrived at is that they *cannot* (my italics) advise their shareholders to adopt the *present* line with a view to its completion or to become subscribers to it. The N.E. Board however are prepared to look *favourably* on the construction of a line of railway properly laid out to meet the requirements of the district and further, so far as can be done, to adopt such portion of your present line as will be consistent with the construction of such new line and to utilise so far as possible any materials, works, etc. which may be available for the new line *paying for the same* according to a fair valuation. If your company thinks it advisable to enter into negotiations (sic) on this basis you will of course advise the Directors of this company.

Yours faithfully, C. N. Wilkinson (Sec.)⁴⁶

Central to the demands of the NER was that the cliff edge line be abandoned; clearly it was not, in their opinion 'properly laid out'. At last in May 1875 an agreement was made, ratified by the Whitby, Redcar and Middlesbrough Union Railway Act of 19 July 1875, between the two companies to complete the line 'with all despatch', and 'in a substantial and satisfactory manner'. The NER would find the necessary capital and work the line upon completion.

Initially, the idea was for a major deviation away from the coast to be made. This would certainly have been a cheaper and easier option, but the new line was never begun.⁴⁷ It would have included a tunnel

near Mickleby of 525 yards in length at an estimated cost of £13,650. The cliff edge section between Stonecliff End and Holmsgrove (see Fig. 17) was indeed abandoned, but the deviation line inland was never built; instead, a tunnel of length 1,652 yards was built which by-passed the cliff edge line and ran from Deepgrove to Holmsgrove, where it emerged for a short section in the open air before entering another — Kettleless — tunnel. It is likely that the NER (with, no doubt, the agreement of the WR&MUR) considered that too much had already been invested in the line to make such a major deviation, or, more likely, that the additional new cost would not be recouped by savings in working or maintenance.⁴⁸

The directors' report to the shareholders of 22 February 1876 clarified the position: 'As provided by the terms of the Agreement, the North-Eastern Company has applied in the present session for powers to make a Deviation of the authorised line, and the Bill is about to be submitted for your approval. The deviation is less extensive than was proposed last Session, and substitutes for the line along the cliff about a mile and a quarter of railway almost all (sic) in tunnel'.⁴⁹

On 13 July 1876 powers for the deviation of the line through what is now known as Deepgrove tunnel (and for the abandonment of the partly constructed works along the cliff top) received the Royal Assent.⁵⁰ The NER had immediately recognised the main problem, but its expensive solution (the construction of Deepgrove tunnel) was to become an important contributory factor for the line's financial difficulties throughout its life and, indeed was, as will be seen, to be the immediate cause of its closure.

However, between 1875 and 1879 no work on this new tunnel was undertaken. The reason for this is clearly explained by the memorandum of the NER Engineer-in-Chief, T E Harrison. Writing just after the long-delayed opening of the line in December 1883 he felt the need to explain and justify the length of time it had taken to construct such a relatively short line. According to this memorandum almost every element in the construction of the line when taken over by the NER in 1875 was faulty. This document has been discussed elsewhere and it is a most important source for understanding the early history of the line.⁵¹ Concerning the tunnels Harrison wrote '... the surveys were so inaccurate that had the original tunnels been completed [those around the cliffs and at Easington], they were so out of line with each other, that no junction could have been

made with them at all'.⁵² The memorandum gives the clearest explanation as to why the construction of the Deepgrove tunnel began so late in the proceedings: it was necessary to get all the other deficiencies remedied first. At Grinkle tunnel problems continued; the memorandum indicating that the delay in opening the line was caused in part by two major landslips at the south end of the tunnel and another a little further south 'extending over four acres of land which slid away for 300 yards.'⁵³



Figure 18: construction in progress at the south end of Grinkle [Easington] Tunnel (Whitby Lit. & Phil.)

Reports submitted to the half-yearly meetings of shareholders between October 1879 and October 1882 indicate that this was the period of the construction of the tunnels between Sandsend and Kettleness. On Friday, 24 October 1879 the shareholders were informed that 'The Mulgrave [i.e. Deepgrove] tunnel is commenced, also involving in its construction a large amount of very tedious work; but the Directors have reason to believe that the Contractor is proceeding surely and steadily (about 800 men being daily employed ...'⁵⁴ Six months later the shareholders were informed that 'Much time, however, must yet elapse before the line can be opened throughout, owing to the very heavy amount of tunnelling to be accomplished ...'⁵⁵ Another optimistic report in October 1880 indicated that, 'The Directors are informed that rapid progress is now being made....where the tunnel through the ironstone beds, near the Alum Works, is being vigorously pushed forward ...'⁵⁶ However, it was at the next shareholders' meeting that the problem of landslips on the line became serious. At this meeting (17 March, 1881) a letter from Harrison was presented in which he gave details,

'The material at the Easington tunnel had for some distance turned out to be wet sand instead of shale as was expected, and this requires the tunnel to be invested with stronger brickwork and all to be timbered in the tunnelling, which as near as I can estimate will cost about £10000 more than the contract.'⁵⁷

The line around the cliffs at Kettleness proved equally problematic. Harrison recalled in his memorandum that

'The three great slips that have taken place on this line are such I have never before in my long practice experienced....The slip in the face north of the Kettleness Tunnel has rendered it necessary to make a considerable deviation of the line for a length of 726 yards, including a tunnel 308 yards in length ... The Kettleness (sic) [he means Deepgrove] Tunnel is 1621 yards long; a heading is made throughout its whole length, and there are only 540 yards remaining to be completed, 1081 yards being finished ...'⁵⁸



Figure 19: construction in progress at the south end of Kettleness Tunnel (Whitby Lit. & Phil.)

This work proved costly: Kettleness tunnel cost in the region of £5000 to construct. The tunnelling work was still in progress as late as February 1882. A complaint by the master of a ship that had run aground near Whitby because lights on the cliffs near Sandsend had been mistaken for the Whitby lighthouse was investigated by Trinity House. Coastguards at Staithes and Whitby stated that these 'lights' were in fact open fires at the entrances to the long tunnel at Deepgrove and Holmsgrove, provided for illumination for the shift workers involved in the tunnelling. This had been going on for two or three years.⁵⁹ After the complaint was dealt with these lights were discontinued. It seems that the tunnels had been completed or nearly so by October 1882, for the shareholders' report for that month stated that '... general engineering works ... nearly completed ...

extra works ... required on the viaducts ...'⁶⁰

The North Eastern Railway spent a considerable amount of money on the construction of the three tunnels. The final cost for the line amounted to £655,077 of which the NER contributed well over £350,000. This high cost was due almost entirely to the need to improve the viaducts, to build or complete the tunnels and to make all the improvements so clearly delineated in the Harrison memorandum. Nevertheless the final product reflected the money spent upon it. Visual evidence, showing the interior of the Sandsend (Deepgrove) tunnel over 120 years after its construction and 50 years after its abandonment shows a very solid and well-built structure. Indeed, so well-built were the tunnels that there is very little reference to them in the three formal inspections carried out by the Board of Trade in 1883, thus indicating that they were not a cause of any concern for the inspectors.⁶¹

The development, construction, and final completion of the line were by no means easy. The main problems concerned the topography through which the line passed and the difficulties encountered in overcoming those problems. The — in retrospect — foolish decision to round the cliffs between Sandsend and Kettleless and the immense costs involved in trying, first of all, to implement that decision and then the necessity to construct two tunnels were factors which were to influence the consequent history of the line, even up to its closure. And, as has been noted above, problems with the Easington tunnel were also costly.⁶²

There were two slightly unusual elements in the construction of Deepgrove tunnel. Two adyts or spoil tunnels were constructed so that some of the excavated material could be taken right to the cliff edge and easily dumped onto the rocks below.

The line was difficult to work. The gradient map shows the many steep rise and falls between Whitby and Loftus.

Especially difficult for train crews was the 1 in 57 bank from Sandsend to Kettleless (with a short stretch of 1 in 62). Most of this steep climb was through Deepgrove tunnel which had been built without any ventilation shafts. The line had been operating for sixteen years before it was decided to ease the difficulties for the drivers and firemen labouring up this difficult stretch of line. Although there is no direct evidence, complaints from the train crews must have been regular enough and loud enough to make the NER construct two shafts.

Detailed plans of these exist in the National Archives.⁶³ They were built in 1900.

As far as the primary sources are concerned, the tunnels pass out of history until September 1957, when the announcement was made that British Railways were to close the line.⁶⁴ The ostensible reason was the cost of immediate and future maintenance, it being considered that £57,000 needed to be spent, mainly on the tunnels and viaducts, in the next five years. This, plus the limited income from the very few passengers that the line carried, was a difficult argument to counter. A glance at Fig. 20 (the north portal of Deepgrove tunnel) shows the distortion of the brickwork and the out of alignment tunnel mouth. British Railways were sufficiently alarmed by the inherent danger of the situation that they put in place temporary repairs, reinforcing the misshapen brickwork with steel rails.

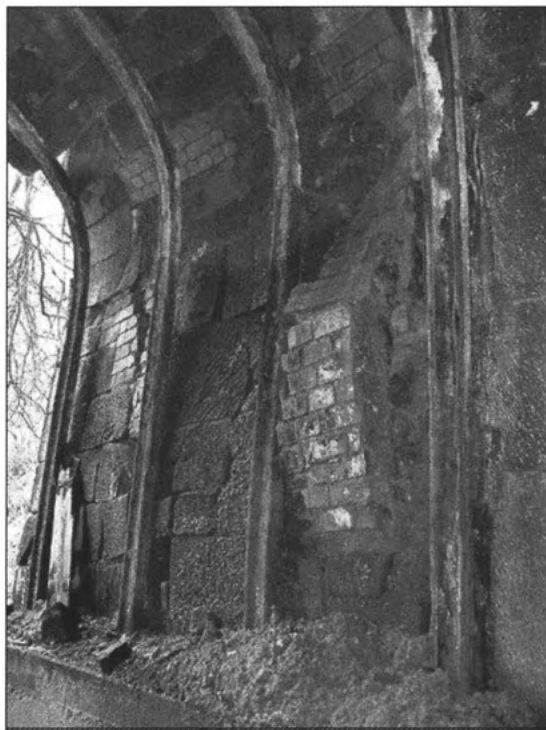


Figure 20: Taken fifty years after the closure of the line, this photograph clearly shows the attempts made by British Railways to temporarily shore up the north portal of Deepgrove tunnel. It was the extent of these problems which led to the announcement that the line was to be closed.

However, while maintenance problems were absolutely necessary, it is more likely that the demands of the 1955 Modernisation Plan had more to do with the closure of the line than the (admittedly large) expense of maintaining the tunnels and viaducts.⁶⁵

When the line closed to all traffic on 5 May, 1958 (the last trains having run on 3 May) the tunnels were left to the vicissitudes of time and weather. However, as has been noted, so well-built were they that well over 50 years later the interiors of Kettleless and Deepgrove tunnels are still in good condition, except for the collapse at the north portal of Deepgrove. Access to the south portal of Deepgrove tunnel is straightforward, as is the north portal of Kettleless tunnel, but the respective north and south portals of these tunnels can only be reached by passing through the tunnels, as the track bed on the cliff face at Holmsgrove is totally inaccessible. While



Figure 21: the north portal of Deepgrove Tunnel on the verge of collapse. In 2008 six feet of the roof collapsed

the ventilator shafts of Deepgrove tunnel exist, the exits in the fields above have been covered over, and there is now no sign of them.

Notes and references

1. HL/PO/PB/3/plan1864/S13 (Scarborough, Whitby & Staithes Railway, 1864. Plan, section, book of reference, published map, gazette notice, list of owners, lessees, and occupiers, estimate of expense)
2. HL/PO/PB/1/29&30 VI n 250 [Local Act, 29&30 Victoria I, c. cxcv (1866)]
3. G H J Daysh (ed.), *A Survey of Whitby and the surrounding area* (Windsor, 1958)
4. R J Irving, 'The Branch Line Problem in British Railway History: the financial evidence from North-East England', *Journal of Transport History*, III ser., 14, 1993, p.42
5. A contemporary representation of Uppang Viaduct may be seen at Figs 6 and 7
6. the following paragraphs are heavily dependent upon 'Viaducts on the Whitby, Redcar and Middlesbrough Railway', *The Engineer*, 14 March 1873, pp.151, 158
7. *Grace's Guide*: 'John Dixon, from the north-east of England and nephew of the John Dixon who was the first Chief Engineer of the Stockton and Darlington Railway, had moved to London in 1864, having considerable success abroad including the construction of a bridge over the Nile in Cairo and extensive drainage and sanitary works in Rio de Janeiro. He is best known for carrying out the transportation from Alexandria to London of Cleopatra's Needle.'
8. 'Viaducts on the Whitby, Redcar and Middlesbrough Railway', *The Engineer*, 14 March 1873, pp.151, 158
9. The National Archives (TNA), RAIL 743 (21 items)
10. TNA, RAIL 527/276; RAIL 743/2; RAIL 743/15
11. see Fig. 17
12. *The Engineer*, 14 March 1873, p.158. Also see Fig. 7, p. 12 (check)
13. TNA, RAIL 743/2
14. TNA, RAIL 1110/501
15. *ibid.*
16. TNA, RAIL 743/15
17. TNA, RAIL 743/9
18. TNA, RAIL 743/2
19. TNA, RAIL 743/9

20. TNA, RAIL 1110/501
21. TNA, RAIL 743/2
22. see n.48 below
23. E M Hutchinson, *Girder-making and the practice of bridge building in wrought iron* (London, 1878)
24. TNA, RAIL 527/276
25. *ibid.*
26. J Prebble, *The High Girders* (London, 1959), pp.69-71
27. TNA, MT 29/44
28. *ibid.*
29. *ibid.*
30. K Hoole, *Railways in Cleveland* (Clapham, Yorkshire), p.46
31. TNA, RAIL 527/276
32. TNA, MT 29/44; Hoole, *Railways in Cleveland*, p.44
33. Williams, *Whitby-Loftus line*, pp.71-3
34. 'Strengthening the East Row and Upgang Viaducts on the Whitby and Loftus Railway', *The Institution of Civil Engineers; with other selected and abstracted papers*, Vol. CXXX (J H T Tudsbery, ed) (London, 1897), Part 5, Section 2, pp.234-40. This article is of a highly technical nature
35. Williams, *Whitby-Loftus line*, pp.124-9
36. TNA, RAIL 743/2
37. TNA, RAIL 743/15
38. TNA, RAIL 743/2
39. TNA, RAIL 743
40. HL/PO/PB/1/1873/36 & 37 V1 n 162 (an Act to authorise the diversion and alteration of the line and levels of the WRMUR; and for other purposes) [Local Act, 36&37 Victoria I, c. cxxi (1873)]
41. HL/PO/PB/3/plan1873/W13 (WRMUR. plan, section, book of reference, ordnance map, gazette notice, list of owners, lessees, and occupiers, estimate of expense)
42. TNA, RAIL 743/2
43. TNA, RAIL 743/15
44. W W Tomlinson, *The North Eastern Railway; its rise and development* (London, 1914), p.669 'By an Act passed this session (1874) they (the WR&MUR) were authorised to raise £100,000 of additional capital and to borrow a further sum of £33,000, but no one would take their shares or advance money on works of so costly a nature'
45. TNA, RAIL 743/2
46. *ibid.*
47. see above p.37
48. probably mainly because the viaducts at Upgang, Newholm, Eastrow and Sandsend were already in place. The estimated cost of the inland deviation line was £73,211 (£3,345,743). See pp. 9/10 above (check)
49. TNA, RAIL 743/15.
50. *ibid.*
51. TNA, RAIL 527/276; Williams, *The Whitby-Loftus line*.
52. TNA, RAIL 527/276
53. *ibid.*
54. TNA, RAIL 743/15. Report submitted to the Ordinary Half-Yearly Meeting of Shareholders to be held at The Station Hotel, York, on Friday, the 24th day of October, 1879 at 2.30 in the afternoon
55. TNA, RAIL 743/15. Report submitted to the Ordinary Half-Yearly Meeting of Shareholders to be held at the Company's Offices, 9, King's Arms Yard, London, E. C. on Saturday, 20th March 1880 at 12 o'clock noon
56. TNA, RAIL 743/15. Report submitted to the Ordinary Half-Yearly Meeting of Shareholders to be held at the Company's Offices, 9, King's Arms Yard, London, E. C. on Wednesday, 13th October 1880, at 3.30 p.m.
57. TNA, RAIL 1110/501. No photographs of the inside of Grinkle tunnel are available as the line is still in use
58. TNA, RAIL 743/15. Report submitted to the Ordinary Half-yearly Meeting of Shareholders to be held at the Company's Offices, 9, King's Arms Yard, London, EC on Thursday, 17th March, 1881 at 2.30 p.m. Also TNA, RAIL 527/276
59. TNA, RAIL 527/276. Also D T Pybus, *Sandsend Railway* (unpublished article, Sandsend, 2006), p. 14; Hoole, *Railways in Cleveland*, pp.43-44
60. TNA, RAIL 743/15. Report submitted to the Ordinary Half-Yearly Meeting of Shareholders to be held at the Company's Offices, 9, King's Arms Yard, London, EC on Tuesday, 3rd October 1882
61. TNA, MT 29/44 (Inspector's reports of 7 July, 1883, 22 August, 1883 and 3 November 1883)
62. see above, p.42
63. TNA, RAIL 527/908
64. Williams, *Whitby-Loftus line*, pp.124-9
65. *ibid.*

Correspondence

Not on Beeching's List

(*RCHS Journal*, March 2013, 3-6 and July 2013, 45)

I offer the following observations on Tim Edmonds' piece and his follow-up letter, which have been discussed and agreed with him.

Kirkham – Blackpool South: this, the direct Marton line, was reduced from a more frequent service to only two Sunday trains (what today would probably be referred to, erroneously, as a 'parliamentary service') from 7 September 1964 and further reduced to summer seasonal use from 31 January 1965. The final service — now down to a single train, 1925 Mondays to Saturdays Blackpool South to Leeds Central — last ran on 3 September 1966.

Cheltenham Spa – Honeybourne – Stratford-upon-Avon: the date of closure quoted (25 March 1968) was for the single round trip between Stratford and Cheltenham, which did not serve Honeybourne. Local services between Honeybourne and Cheltenham had been withdrawn from 7 March 1960, while those between Honeybourne and Stratford (*Passenger Services to be Modified – Section 2*) were not withdrawn until 5 May 1969.

Eastleigh – Romsey: line retained for summer seasonal use until summer of 1987 inclusive, and thereafter for two trains: 2145 Mondays to Fridays Bristol to Southampton (advertised), withdrawn 16 May 1988, and 0750 Mondays to Fridays Eastleigh to Salisbury (unadvertised between Eastleigh and Romsey), withdrawn 15 May 1989.

Wormit – Newport on Tay East: the western terminus should read **Dundee** as the section between Wormit and the junction at Tay Bridge South signal box was not excluded from the closure, as might be inferred from the entry as it stands.

Birmingham Snow Hill – Wolverhampton Low Level: the sections north out of Wolverhampton Low Level and south out of Birmingham Snow Hill both closed from 4 March 1968, when their services were diverted to High Level and Moor Street stations, respectively (not 6 March 1967, as might be inferred from the entry as it stands in respect of the former).

Paignton – Kingswear: BR had ministerial authority to abandon their service after operation on Saturday 28 October 1972. As DVR wanted a winter service to continue — but could not themselves yet run it — they contracted BR to continue service on their behalf until completion of transfer of ownership from 30 December 1972. BR's service was thus withdrawn from 30 October 1972 — but immediately replaced by a (reduced) service operated by BR under charter to DVR until the year-end, and by DVR themselves thereafter. In the end, however, regular winter operation proved to be too much of a drain on DVR resources and was withdrawn from 8 October 1973. This was set out in the Society's *Railway Chronology Group Co-ordinating Newsletter* no. 66.

Morecambe – Heysham Harbour: trains ran on 7 October 1975 so the withdrawal date should read 8 October 1975.

Stratford – Tottenham Hale: the withdrawal date was 8 July 1985 — although a single train, 2245 Mondays to Fridays Norwich to Liverpool Street (latterly unadvertised over this section), continued to use the route until withdrawn from 18 May 1986.

Yate – Mangotsfield – Bristol: the closure (and diversion) had been scheduled to take effect from Monday 29 December 1969 but the line was blocked by rubble dislodged by a lorry about ¼ mile west of Fishponds at 0830 on 27 December 1969; trains were immediately diverted by their new route via Filton Junction.

After discussion, we concluded that the final three entries of the original listing should be deleted, for the lines in question were closed only temporarily, so that they could be modified for *continued rail passenger operation* as light rail or metro. Incidentally, analogous with them would be the Tyneside lines which were closed so they could be converted for Tyne & Wear Metro and the various lines (the most recent of which was the Rochdale via Oldham line) in Greater Manchester which were likewise closed for conversion to Metrolink. Other examples of lines which have since become light rail would be in a different category, being the fortuitous use of closed infrastructure rather than closure specifically to enable immediate conversion. **Richard Maund**

A Review of the Beeching Era

(RCHS Journal, March 2013, 7-20)

In page 18 of my article the heading to 2d should end '... but not formally proposed for closure'.

Allan Brackenbury

Transport Modes and Conversions

(RCHS Journal, July 2013, 21-7)

After reading Joseph Boughey's essay, I looked at Peter Paye's book on the Mid-Suffolk Light Railway (Wild Swan, 1986, page 58). After the (unwilling?) take over of the MSLR by the LNER in 1924, proposals were examined by which the whole line would have been converted into a toll motor road for light traffic.

The railway land was only able to accommodate a road 12 feet wide while the Ministry of Transport required 20 feet width if the road was to be for two-way traffic. Consequently the scheme did not go ahead especially as three of the few bridges would have to be reconstructed to MoT standards. In addition the quotation for a bus service along the converted line was unacceptably high. Surveys showed that most passengers on the MSLR wanted to go to towns north and south of the branch line and preferred a direct bus journey. Even today, much personal and farm business in the district is conducted in places north and south of the line of the MSLR which were connected to the rail system before the light railway was built (e.g. Diss and Framlingham). Nearby Eye fell into decline despite the construction of a stub branch line sponsored by local people

Many members will know that the MSLR scheme was intended to connect Halesworth to Haughley and also Kenton to Westerfield. Work commenced on the Haughley to Laxfield section which passed through almost level country for the most part with no large industries or important market towns

which would have provided a base for traffic. At the time of construction farmers in Mid-Suffolk were switching from cattle production to wheat and barley following the introduction of powerful ploughing machinery. If initial construction had been directed towards the county town of Ipswich with its Corn Exchange and shops then traffic levels might have been different. Providing access by the cheapest route seems to have been the major concern as the Kenton to Westerfield line would have run through undulating countryside, crossing some river valleys en route.

It seems important that the MSLR was not constructed along a natural traffic route. Even today car drivers wishing to go along the course of the line must navigate through numerous indirect lanes. Main line railways served busy traffic routes and were (and are?) not candidates for conversion.

In the 1950s, after the MSLR and other local lines had closed, farmers complained about the roads and a number of local roads were joined up with improvements and bits of new road to form the roughly parallel A1120 (Stowmarket-Yoxford). A drive today along the A1120 reveals a poor quality road for Class A with very moderate traffic by today's standards. Again the A1120 is not a natural traffic route — its heyday may well have been when the few straight stretches formed part of what is said to be the Roman road to the then important port of Dunwich.

I recently asked a farmer friend about transport of modern farm needs and products. Although his farm extends right up to a station on the East Suffolk line, he does not seem to have used rail for many years (local freight traffic here ceased in the 1960s. In years gone by sugar beet was required to be sent by rail necessitating hand loading at the farm and again at the railway siding; the destination was then decided by the sugar factory authorities depending upon which factory could take the beet. Nowadays sugar beet goes by road, sometimes hauled by powerful farm tractors, which can travel at up to 40mph. Durum wheat from the same farm is used to make pasta and goes to Italy by sea from Ipswich or Lowestoft. **Richard Tyson**

Trent & Mersey Canal Early Notices and Posters (*RCHS Journal*, July 2013, 2-9)

Peter Brown's fine article demonstrates how printed notices and posters can importantly supplement our knowledge and understanding of the social, technological, engineering, and legal aspects of railways and canals.

As many of these documents were directed at boatmen, one must wonder whether they could read and comprehend the messages. The literature indicates that boatmen were not well-educated (if educated at all) and were most likely illiterate, especially in the late 1700s and early 1800s.

Noting that David Bosworth signed with an 'X' (p.3) one wonders if he could read the statement, or if it had been read to him. Peter Cross-Rudkin (*RCHS Journal*, March 2010, 38) wrote of sparse literacy among canal navvies. The British Railways *Rule Book* (at least as late as the 1960s) mandated that 'Each Ganger or Sub-Ganger must read and explain to each man all the Rules and Regulations so far as they relate to his duties ...' suggests illiteracy and/or possible lack of comprehension.

The notices and posters indicate the policies of the canal company, but they might not reflect the actual behaviour and practices of the boatmen. One wonders: would a boatman have been charged and held liable for an offense or wrongdoing that he had no knowledge of because of his illiteracy? The successful prosecutions suggest that 'ignorance of the law' may not have been an acceptable defence. The Stone Association would likely not have been impartial as a county police force.

The bound volume of notices suggests that it was the Guard Book or Book of Copies maintained by Smith, printer, Newcastle, as mandated by 39 Geo. III, cap. 79. Smith was a prominent Newcastle printer, and his work reflects careful design, composition, and printing.

Alan M Levitt

Holding the Line: how Britain's railways were saved

(*RCHS Journal*, July 2013, 56)

I should like to add to Graham Bird's review of this book.

A search on the Amazon website identifies thirteen books published to mark the fiftieth anniversary of the publication of the Beeching Report, plus one that is only available in a Kindle edition. This must

be the only year that the Great Western Railway has not topped the list of new railway books — a measure of Dr Beeching's status in railway folklore.

In all these books the analysis of the man, his reports, and the events that preceded and followed them cover well-trodden ground, with varying degrees of emotion and prejudice. Two common trends emerge: a strong tendency to make ahistorical judgements on the events and opinions of fifty years ago based on today's circumstances; and a softening of attitudes towards Beeching himself. Only three of the books offer new insights for the historian, by far the most outstanding being Faulkner and Austin's *Holding the Line*.

As Graham says, the effects of the Beeching Report do not dominate this work. Rather, they are presented as part of a more extended study of the repeated attempts over many years to close a great deal more of the British Railways' network. One of the strengths of the book is the use of government records that were not available to Terry Gourvish for his two-volume history of BR. Another is the authors' close understanding of the events recorded in the later chapters, derived from their personal involvement at the interface between the British Railways Board and Government. The result is an authoritative, readable work, particularly valuable for its evaluations of the key personalities. The chapters on 'Appraising Peter Parker' and 'The rise and fall of Sidney Weighell' give due weight to two of them whose record was fully as significant as Beeching's.

This book should be recognised as an important contribution to the political history of British Railways.

Grahame Boyes

Three Hundred & Seventy Two Horse Power: the Rochdale Canal 1888-1921

(*RCHS Journal*, March 2003, 238)

An image from the Manchester Central Library illustrating this article was titled 'Rochdale Canal, 1899', to which the Editor added a query: 'Any suggestions about the exact location?' It is actually the Bridgewater Canal at Runcorn. The road on the left is Halton Road - the nearest building was built in 1893 for the Runcorn Co-operative Society Limited: see <http://www.canalwalking.co.uk/photograph.php?opt=runcorn&photo=329>

Glenn MacLeod

Kent & East Sussex Railway

(*RCHS Journal*, March 1985, 181)

The following letter appeared in the *RCHS Journal* above:

The Kent & East Sussex Railway

Sir, – As records of the opening dates of the Kent & East Sussex railway differ in modern publications, I arranged for contemporary records in Kentish newspapers to be consulted. I consider it advisable to put on record the following information.

Rother Valley Railway, opened Robertsbridge to Rolvenden (then called Tenterden) for goods 26 March 1900; for passengers 2 April 1900.

Opened Rolvenden to Tenterden Town, all traffic 16 March 1903. Name of Tenterden station changed to Rolvenden same date.

Name changed from Rother Valley Railway to Kent & East Sussex Railway 1 June 1904.

Opened Tenterden Town to Headcorn, all traffic 15 May 1905.

Members who have a copy of Clinker's Register of Closed Stations should amend date in Note 4268, page 179; 15.4.1903 to read 16.3.1903.

H.V. BORLEY

Unfortunately, Horace Borley failed to cite the newspapers upon which he relied for the opening dates; they were:

for '2 April 1900': *Kent County Examiner & Ashford Chronicle* of 6 April 1900 (reproduced at *The Railways of Southern England: Independent Light Railways*, Edwin Course, B T Batsford, 1976, p.43)

for '16 March 1903': *Kent County Examiner & Ashford Chronicle* of 6 March 1903 p.4:
"Tenterden – New Station. The new station at the back of the High Street will be opened on Monday March 16th. It will be called Tenterden station, and the present Tenterden Station will be renamed Rolvenden Station. The new station will be a great boon to travellers..."

and of 20 March 1903 issue: page 5: 'THE TENTERDEN RAILWAY, OPENING OF THE NEW STATION Monday last [16 March] was a gala day in Tenterden, the opening of the new town station being celebrated with the greatest enthusiasm... The reason for Monday's rejoicing was the opening of the new station in Coombe Field, close to the High Street... For the proceedings on Monday a large marquee had been erected... The programme was timed to commence at 12 o'clock... The arrival of the midday train from Robertsbridge was the first train to bring passengers into the new

station...' [the scheduled 1110 from Robertsbridge was due at 1157].

The paper's weekly issue up to 13 March showed only the original Tenterden station (latterly named Rolvenden) — the succeeding issues showed both Rolvenden and Tenterden. For unknown reasons, a number of distinguished historians besides Clinker quoted 15 April as the opening date but that is clearly incorrect.

for '15 May 1905': *Ashford Chronicle* of 19 May 1905 (reproduced at *The Railways of Southern England: Independent Light Railways*, Edwin Course, B T Batsford, 1976, p.46)

Both the 1900 dates (goods and passenger) and the 1905 date are confirmed by the Directors' Minute book [The National Archives RAIL 332/1] — minutes of 30 March 1900 and 21 June 1905. Alas, they did not bother to minute the 1903 opening.

Richard Maund

continued from page 32

58. CP, 15 February 1920
59. Thomas Inskip (1867-1947) had been elected as Conservative MP for Bristol Central in 1918 and would remain such until 1929; John Butcher (1853-1935) was a veteran York MP from 1892 to 1923 (bar 1906-10)
60. quoted in Robert Self, *Neville Chamberlain: A Political Life*, Ashgate, Aldershot, 2006, pp.79-80
61. *Observer*, 29 February 1920
62. *ibid.*
63. The Waterways Association, *Objects and Policy*, 1920
64. CP, 15 March 1920
65. CP, 27-28 March 1920, 3 April 1920. Auckland Geddes, the Minister's brother, who had just resigned as President of the Board of Trade
66. CP, 24 April 1920
67. CP, 15-16 June 1920
68. *Carrying Trades Review*, vol.XVI, no.189, 15 June 1920

Reviews

***The Caledonian Railway, Scotland's Imperial Railway: a history* — David Ross**

252pp, 273x210mm, 143 b&w illustrations and 16 maps, hardback, Stenlake Publishing, 54–58 Mill Square, Catrine, Ayrshire KA5 6RD, 2013, ISBN 978 1 84033584 2, £30

The Caledonian was one of the two main pre-grouping companies in Scotland. Its main lines completed the West Coast route to Scotland and ran from Carlisle to Glasgow, Edinburgh and Aberdeen. It employed 29,000 staff at its peak and ran stylish passenger trains hauled by distinctive blue engines, but its bread and butter was the mineral traffic of Glasgow and Lanarkshire.

Although there have been numerous books about smaller companies this is the first time for many years that the history of one of the larger pre-grouping railway companies has been published. In undertaking this major project, the author decided to present the story in chronological order so one gets a very good idea of the complexity of managing such a large organisation. It is hard to see what else he could have done but it does make following particular threads more difficult.

Of the sixteen chapters, fourteen are devoted to the development of the Company, from its gestation to the grouping. Chapter 15 reviews how the staff were treated. The last chapter gives a potted history of locomotive development; this seems out of place to your reviewer. A timeline shows major events over

the years. There is a bibliography, references and an index.

The author has worked assiduously through original sources, including minute books and newspaper reports. His style is simple and direct. Each paragraph is packed with details; little seems to have been missed. Extensions to the system, abortive proposals for lines and the shady financial dealings of the early years are all described. But we do not find out much about the Company's commercial development and its relations with other railway companies and customers; the author recognises this in his Foreword, acknowledging that a book of twice the size would have been needed.

The way the publisher has laid out the book does it no favours. The single column text is difficult to read, subheadings and captions and page titles are all in the same font. Several of photographs are from poor originals and not directly related to the text.

But overall, this is a significant and substantial work which deserves to be on the shelf of anyone interested in Scottish railways or in the larger pre-grouping companies.

KEITH FENWICK

***Paddington Station: its history and architecture* — Stephen Brindle**

183pp, A4, 174 illustrations, maps & drawings (many in colour), paperback, English Heritage, Fire Fly Avenue, Swindon SN2 2EH, 2013, ISBN 978 1 84802 089 4, £25

This second edition of Stephen Brindle's book is in a larger format than the first, reviewed in the March 2005 number of the *Journal*, and is much the better for it, with a more legible print size. The text has been revised and updated to include the recent refurbishment of the 1913–14 roof span at Paddington, achieved only after defeating controversial proposals to demolish it; the tricky job of rebuilding Bishops Road Bridge; and the forthcoming Crossrail platforms on the Eastbourne Terrace side of the station which will involve a redesigned entrance.

There is also an account of the virtual last-minute discovery of a cast iron canal bridge designed by Brunel in Bishops Bridge Road, hitherto concealed

by brickwork until it was about to be demolished in connection with the main bridgeworks. The author has played a leading role in its identification, dismantling and planned re-erection further along the canal.

The numerous illustrations, a number of which are new, are excellently reproduced. Most of them have considerable historical value, which together with original drawings and plans, many in colour, combine to form an attractive book. Is it too much to hope for a similar authoritative survey of another early London terminus — say Waterloo, which may lack the charisma of Paddington but has an interesting history unrecorded in any detail?

GORDON BIDDLE

***Speedbird: the complete history of BOAC* — Robin Higham**

486pp, 234x160mm, 111 illustrations, 3 maps, hardback, I B Tauris, 6 Salem Road, London W2 4BU, 2013, ISBN 978 1 78076 462 7, £30

Sometimes a book has a history as tortuous as the story it tells: this is one such. It was in 1960 that Robin Higham was commissioned by the airline to write BOAC's history following his masterly history of Imperial Airways which had followed his PhD. The work was completed but events at the airline and a change of chairman saw publication postponed. When British Airways was formed in 1974, it was decided that a BOAC history should be prepared. When it was remembered that the earlier history had already been written, Higham was given a new contract, an office and a lot of internal help, but publication was again delayed by politics after which BA's legal department blocked it. Eventually in 2000 there was a change of heart but by this time the original publisher had lost interest.

With great use of primary sources, particularly the airline's records at Heathrow and state records in the National Archives, the result is a most impressive work. The early history of the airline during the war years is particularly intriguing. Delightful quirks are revealed such as the Treasury refusing to allow the

issue of stock for fear it might hurt war bonds. The author however does not appear to have discovered that it was its first and reluctant chairman, the then Sir John Reith, who decided on its name. But the author was constrained as to how much he could publish and he acknowledges this, mentioning particularly overseas stations. Nevertheless, the work would have been richer if a little more had been included about personalities. Perhaps there could also have been more about other countries' airlines, both as competitors and as possible sources of ideas on strategy.

The bibliography, which runs to over thirty pages, is very good and even includes medical works by BOAC staff; and there is a reminder of the importance of telephone directories in tracing organisational and staff changes. The detail in the seven appendices is particularly useful, although the listing sequence of the aircraft fleet does not seem to have any logic.

Robin Higham's book will always be the definitive history of a most important airline. JOHN KING

***Dr Beeching's Remedy: a cure for a century of the railway's ills* — David N Clough**

160pp, 255x200mm, 167 photographs, 15 tables, hardback, Ian Allan, Hersham KT12 4RG, 2013, ISBN 978 0 7110 3542 3, £22.50

This is a helpful general analysis of the impact of Beeching both on the contraction of loss-making services and in terms of planning for the future, drawing both upon the various well-known published sources as well as archival sources; though the latter are mentioned, there is no specific detailed list to explain their nature.

Early chapters review early railway company profitability, using the Lancashire, Derbyshire & East Coast Railway as an example of costly duplication. Some of this is interesting but pressure to be brief means there is a risk of leaving some complexities aside; a potentially interesting point about industry and railway profitability needs expansion to be convincing. Two challenging topics for railway historians are tackled energetically: finance and management structures, with some helpful material on charges for goods and sundries traffic. This gives a good overview of the financial and operating problems that Beeching inherited. Commission member H P Barker is seen as one of the few to earn credit.

What emerges is how quickly Beeching came and

went — only 11 pages of text, not starting until page 105, refer directly to the Beeching 'era'. Of the famous names associated with railways, he must surely have had the greatest impact in the shortest time. Thus perhaps Beeching is open to the accusations of being over-hasty, and the limited nature of the statistical analysis at the time is well known, but issues such as the chronic under-use of coal wagons and outdated manning practices were easy targets.

The book is well-illustrated with often evocative pictures of fading branch lines and poorly thought-out early dieselisation.

The authoritative impact of the text might have been stronger had some unnecessary comments been edited; asides about 'left wing commentators', armchair managers and the inabilities of 'military men' add little to the strength of the arguments being put forwards. There are also a few comments about trades unions, but a measured analysis of whether or how far they sowed future destruction by resisting modernisation of working practices might have been very interesting. ADRIAN GRAY

***William Dargan: an honourable life, 1799–1867* — Fergus Mulligan**

xi+300pp, 232x156mm, 96 illustrations, hardback, Lilliput Press, 62 Sitric Road, Arbour Hill, Dublin 7, Ireland, 2013, ISBN 978 1 84351 395 7, •25

‘William Dargan is arguably the greatest Irishman of the nineteenth century.’ On the basis of what he achieved for his fellow countrymen during a very difficult period in their history, this book’s opening sentence must surely be true and this, his first full-length biography, is long overdue.

Dargan received his initial training under Telford on the Holyhead road, and then built up his experience in various capacities on road and navigation works in Ireland and on parts of what was to become the Shropshire Union Canal. (It was while working on the Birmingham & Liverpool Junction Canal that he met and married his wife, Jane.) But it was his successful bid for constructing the Dublin & Kingstown Railway, Ireland’s first passenger railway, opened in 1834, that was the foundation of his reputation. Although he partnered William McCormick as contractor for the Liverpool & Bury and parts of the Manchester & Leeds Railways, he concentrated his efforts on Ireland.

He is remembered chiefly as Ireland’s greatest railway contractor (building nearly a quarter of the total mileage), but his later engineering works also included canals and harbour improvements; he was largely responsible for establishing Belfast as a major port and ship-building centre. His business interests too were much wider. He invested heavily, or accepted shares, in several of the railways he built and in associated hotels. In his later years was

chairman of the Dublin, Wicklow & Wexford Railway, having already promoted the development of Bray as a popular seaside resort. Further afield he was actively involved in promoting shipping links between Northern Ireland and Liverpool and between Galway and the USA.

But it is his promotion of agricultural works — land reclamation and the development of the flax, peat, sugar beet and whiskey industries — that perhaps reveals most about the man. It seems clear that he felt a duty to exploit his wealth, or more accurately his ability to borrow money from the Bank of Ireland, to create employment, sometimes not altogether wisely. Speaking in 1847, during the potato famine, he could claim to be employing no fewer than 50,000 men in various projects across the country.

In his final months he lost heavily in the market crash of 1866, but he did not, as has been stated, die a bankrupt. When his complicated financial affairs had been settled, his widow survived him in some comfort for 27 years.

The presentation of the book is traditional in style. Although this might be considered appropriate for the subject, the uncoated paper does not help the illustrations. The addition of a map of Ireland showing the location of Dargan’s railways and other enterprises would have been helpful for non-native readers.

GRAHAME BOYES

***Travels in the Valleys* — Robert McCloy**

189pp, 236x166mm, 47 b&w photographs, 13 maps, paperback, The Historical Association, Swansea Branch, 6 Cefn Glas, Tycoch, Swansea SA2 9GW, 2012, ISBN 978 0 9574178 0 9, £12.99 (plus £2.50 p&p). Cheques payable to ‘The Historical Association, Swansea Branch’.

The sub-title of this book is ‘A study of road passenger transport in the half century since the First World War’. It examines Merthyr inter-war, Swansea in WW2, Cardiff immediately post-war and Newport between about 1953 and 1963.

Merthyr was seriously hit by high levels of unemployment during the Depression due to the closure of the local steelworks and some of the coal mines. There was even talk of abandoning the town entirely but the bus services enabled workers to find employment outside the immediate area although it meant a very long day. Swansea, which unusually

did not have a municipal bus operation, was heavily bombed during the Second World War but the local bus services came to the rescue by taking residents to the comparative safety of the surrounding areas while still getting workers to the factories or other places of employment. Cardiff in the post-war period lost its trams, engaged in a love affair with trolley-buses and acquired a new bus station for the wide range of stage carriage, limited stop and express services heading for and through this capital city. Newport Corporation bus services bore the brunt of the social and economic changes of the 1960s with

increased car ownership, fare rises, congestion and relocated industries (such as the Llanwern Steelworks) all leading to reduced usage with losses on the service accumulating due, at least in part, to a failure to introduce modern operating methods.

This is neither a spotter's book nor a 'history' as such of the bus services in South Wales. Instead it is an examination of the relationship between bus operators, the traffic commissioner, the local authorities and (to a lesser extent) central government and employees. The conclusion seems to be that, in period under review and with hindsight, the well intentioned regulation of the bus services and competition did not really benefit the travelling public and that the restrictions had a negative effect as a whole. The study closes before deregulation and privatisation of road passenger transport throughout

the country in the mid-1980s which changed everything.

Surprisingly little is said in the book about competition between buses and railways in the area but this could be down to geography as the railways tended to hug the valley floors while buses were more flexible in being able to serve the growing hillside communities, adapt to changing travel patterns and provide a more frequent and cheaper service than that by the trains.

The book is illustrated throughout with photographs of some interesting buses and street scenes, which will please enthusiasts, together with appropriate maps. It is fully referenced and has an impressive bibliography containing a wide range of primary and secondary sources, some of which are quite obscure, and an index.

RICHARD COULTHURST

***Rope & Chain Haulage: the forgotten element of railway history* — Colin E Mountford**

384pp, 240x175mm, 258 b&w images, 112 colour, 65 maps & diagrams, hardback, Industrial Railway Society, 2012, 24 Dulverton Road, Melton Mowbray, Leicestershire LE13 0SF, ISBN 978 1 901556 84 1, £29.95.

The author will doubtless be well known to many members for his 1966 book devoted to the Bowes Railway and his contributions to four of the 'Early Railway Conferences'. As he points out in his introduction, it is a surprising fact that no book has previously been published devoted exclusively to the subject of rope- and chain-haulage on railways in Britain. This magnificent volume, the result of a lifetime's painstaking research by the author and some acknowledged contributors, fills this literary anomaly in comprehensive style. It also includes items on the most interesting examples from abroad: several from New Zealand plus the remarkable Serra Nova and Serra Velha inclines on the Sao Paolo Railway in Brazil. (Funicular railways, street tramways and canal inclines are not included, however.)

The ten chapters are divided into categories ranging from self-acting inclines to the stationery engines used on powered inclines, haulage in different historical eras and on different gauges. Separate chapters are devoted to hardware details and unusual incline systems. The concluding rather sad and rueful chapter considers the current state of the preservation scene, particularly the now overgrown Bowes Railway which closed in 1999: disinterested local authorities, vandalism, no steam locomotives masquerading as 'Thomas the Tank Engine', so no tourists and no money.

The 15 page index is superb, analysed by the haulage system, railways, stationery steam (and electric) engines and their manufacturers, passenger services, and finally the key people involved. As a search-engine, it could not be bettered. The publishers and printers deserve to share the accolades for the art-paper used throughout and the faultless quality of the reproduction of the extensive illustrations and the clear maps and gradient profiles.

Undoubtedly this book will become the standard work on the subject, but is the subject itself too esoteric to be of wide interest to members? The 65 page chapter on 'railways, inclines and haulages, 1822-40' could in itself be considered worth the price, let alone the fascinating insights into the workings of iconic systems such as the Cromford & High Peak Railway and the slate railways of north Wales.

In spite of the tragedy of the Bowes Railway, the book ends with a glimmer of optimism surrounding the work currently being done to excavate, and eventually partially restore, the engine room under the rope-hauled Camden Bank on the old London & Birmingham Railway. Perhaps also we should not forget that the futuristic, experimental MAGLEV line that ran to the airport from Birmingham International railway station was replaced in 2003 by the present system, which like the famous San Francisco cable cars, uses continuous rope haulage.

MILES MACNAIR

***Sauce Supreme: the annihilation of British Transport Hotels Ltd* — P A Land**

167pp, 200x122mm, no illustrations, paperback, Dawn Rite Publishing, 2012, ISBN 978 1 4801 0577 5, order on-line from Amazon, £4.99

The British Railways Board subsidiary, British Transport Hotels Ltd, owned one of Britain's biggest hotel chains, with 29 hotels, ranging from the internationally famous, such as Gleneagles, to modest station hotels such as the Great Northern at Peterborough, together with Travellers' Fare catering and station trading. Like its parent, the company had very restricted funding, and all the hotels were in varying degrees rundown and in need of modernisation.

In 1979 the company's board, led by the recently-appointed group managing director, Peter Land, produced a business plan for rejuvenating its portfolio. It included provision for raising capital for major hotel projects through joint ventures with the private sector, which it was expected would find favour with the thinking of the newly-elected Conservative government.

Whilst retaining commercial viability, the plans were changed to respond to political and bureaucratic pressure. A management buyout proposal was agreed by the BR Board, then rejected by the bureaucracy, leading to government instructing a sale by public tender.

The story has been well told by Terry Gourvish in his *British Rail 1974–97* (pp 232–41). This was based partly on this fuller account, written by Peter Land shortly after the events, but only now published after thirty years. In it he sets out his perplexity and frustration with the indecisive process that eventually extended over more than three years: 'the hopelessness of trying negotiate with a sponge'.

Was this a problem of extended channels of communication, with the ultimate power, the Treasury, never appearing but always in the background — or a problem of language — or of personalities? Or was it, as Land came to believe, the incompatible objectives of those responsible for running a business, those serving government and those elected to govern — a problem that must have become worse in later years as fewer MPs are elected with business experience.

Whatever the reasons, there were clear portents here of the annihilation of British Railways ten years later. This is one man's account of what it was like to be at the centre of such events and a unique primary source for studying the history of railway privatisation.

GRAHAME BOYES

Paddle Steamer Kingswear Castle and Steamers of the River Dart

— Richard Clammer & Alan Kittridge

76 pp, 210x196 mm, 45 b&w and 68 colour photographs, 5 line drawings, 1 map, paperback, Twelveheads Press, PO Box 59, Chacewater, Truro TR4 8ZJ, 2013, ISBN 978 0 906294 77 2, £14

This is, in part, an enlarged and updated version of the author's 1987 work *Passenger Steamers of the River Dart & Kingsbridge Estuary*. The opening chapter traces the development of transport on the River Dart, in Devon, noting the first mention of a pleasure steamer in 1836, and running through to the formal incorporation of the River Dart Steamboat Company in 1906. The next two chapters follow the fortunes of steamers and the RDSCo on the Dart up to the ending of the company's operations in 1974.

The focus then moves to the *Kingswear Castle*, a steamer built in 1924 (interestingly, using the engines of an earlier *Kingswear Castle* from 1904), which was withdrawn from service on the Dart in 1965. The interest of the Paddle Steamer Preservation Society

is explained, along with its move to the Isle of Wight, through restoration and use on Medway-based excursion services between 1984 and 2012. The final section describes its return to regular services on the Dart for a maiden voyage on 29 March 2013.

The book has been excellently produced, with a good range of modern and historical photographs, most of which are clear and have reproduced well. A map of the Medway area, in which the vessel operated for many years, might have been helpful, but this is a minor omission.

Overall, it provides a creditable combination of company history, ship listings, a history of the vessel's restoration, and a helpful contribution to the history of tidal river navigations.

JOSEPH BOUGHEY

***Steaming to Victory: how Britain's railways won the war* — Michael Williams**

x+374pp, 233x150mm, 37 b&w illustrations, hardback, Preface Publishing, 20 Vauxhall Bridge Road, London SW1V 2SA, 2013, ISBN 978 1 848 09314 0, £25

Within its 16 chapters this volume offers a very readable account of the story of Britain's railways during World War II. Three chapters are devoted to the preparations for war, although the first one, 'Goodbye to the Golden Age', somewhat overplays the glamour of the pre-war expresses. Three chapters are devoted to the Blitz and one to the London Underground. Chapter 12, 'The Tools that did the Job', well explains the demands placed on the railways by the need to deal with troop movements, airfield construction and munitions manufacture. Chapter 14, 'Is Your Journey Really Necessary?' considers the difficulties of making radio, film and written accounts of the railways' war.

This is a volume which gives some rewarding insights: for example, into the massive volumes of traffic carried, and the privations suffered by many of those at the sharp end. The author makes the valid point that bombing, though serious enough, was relatively ineffective in halting railway operations. However he perhaps concludes too readily that the Germans were 'incompetent' and that the destruction of certain strategic targets such as Sutton Weaver viaduct, had it been carried out, would have had the effect of 'wreaking havoc on the entire network'. The author clearly aims to tell a dramatic tale and the over-frequent use of terms such as 'merciless onslaught' and 'heroes of the hour'

sometimes borders on the journalistic. Certain well-known events, such as the 1943 disaster at the unopened Bethnal Green tube station, are covered twice.

The book also makes some claims which cannot be sustained. Considerable space is devoted to the well-known explosion at Soham, Cambridgeshire in June 1944 which we are told was 'the biggest single blast in wartime Britain'. But its magnitude was far exceeded by that of the incident at RAF Fauld, Staffordshire, in November 1944, which reshaped the landscape and resulted in about 70 fatalities — the precise number remaining unknown. There are also some elementary errors — for example, the HST dates from the 1970s not the 1990s, John Elliot Blumenfeld's name is mis-quoted, and the author seems to believe, curiously, that the pre-war *Flying Hamburger* took its title from the popular American food product, rather than from the north German seaport.

Although much of the ground has been covered elsewhere, the strength of this volume lies in its wealth of personal recollections — some the result of interviews with the author, others written previously, in many cases soon after the event. However, as a factual account it needs to be treated with caution. An index and bibliography are included, although no primary sources appear to have been consulted.

GRAHAM BIRD

***Freightliner* — Paul Shannon**

112pp, 280x215mm, 154 colour photographs, hardback, Ian Allan, Hersham KT12 4RG, 2013, ISBN 978 0 7110 3688 8, £25

Launched in 1965, the 'Freightliner' concept of running block trains of containers between specialised handling terminals proved a success. Under the 1968 Transport Act, Freightliner Ltd became a company separate from BR. The domestic network was pruned in the 1980s but the services from ports, particularly Felixstowe, grew strongly to become the dominant part of the business. The company was privatised in 1996; since then it has diversified, first focussing on railway infrastructure movements and by 2012 capturing 30% of the UK bulk freight market. Operations in Poland started in 2007 and in Australia in 2009.

This book explains how and why the traffic flows have altered, and how Freightliner has responded. The inter-related issues of containers, rolling stock,

locomotives and terminal operations are discussed. Three chapters are used to illustrate aspects of the activities: Trafford Park for terminal workings, Ellesmere Port to Fiddlers Ferry coal trains as an example of the 'Heavy Haul' traffic, and Crewe Basford Hall yard as the principal operational centre.

It is not a full business history as there is little mention of finance or the non-UK activities and none of personalities, nor are the company's strengths and weaknesses over the years analysed. There are no maps (so keep a copy of OPC's *Rail Atlas* handy), and the Trafford Park and Basford Hall chapters would have benefited from having track layout diagrams. On the other hand, it reads well, production standards are high and it is copiously and attractively illustrated.

PETER BROWN

***Airwork: a history* — Keith McCloskey**

272pp, 245x170mm, 81 illustrations, paperback, History Press, The Mill, Brimscombe Port, Stroud GL5 2QG, 2012, ISBN 978 0 7524 7972 9, £17.99

The history of the Airwork Ltd and its subsidiaries at home and overseas is quite complex, and this work is the first major attempt to explain it. In general, the author has succeeded in his task. Certainly the company has a special place at the centre of British aviation history. In many ways, it is a personal story in that the company was begun by two individuals, Nigel Norman and Alan Muntz, who invested their capital in an industry with an uncertain reward.

Airwork's activities over the years were many. The company began with the opening of Heston Airport in 1928 and it managed other airports for their owners such as Newtownards for Lord Londonderry in Northern Ireland and the municipally-owned Barton at Manchester from 1933. It never managed Gatwick but from the late 1930s it had a major maintenance depot at the airport. Airwork also had many overseas contracts which included the setting up of national airlines in countries such as Egypt. There were also many overseas military contracts.

After the war, the company could have played a much bigger part in British air transport history but

for the regulatory system. Nevertheless it expanded in the later 1950s by acquiring Transair, Morton and Bristow Helicopters, becoming in 1959 the largest private airline. With the merger of the airline interests of the British & Commonwealth Shipping Group and Hunting Clan, it became British United Airways in 1960.

The author has clearly endeavoured to unravel the story as much as he could and no doubt his original text was much longer. As for his sources, he has uncovered some unpublished material and private papers; and he has interviewed many former Airwork staff. If there is to be a criticism of what is a very good book, it is that the author appears to have made little use of primary sources in the National Archives where there are several Airwork files of the Colonial Office and Air Ministry, while the Airwork Ltd board minute books can be seen in the British Airways archives at Heathrow. Certainly this book is essential reading for anyone wanting to understand the intricacies of the private sector in British civil aviation history over a long period of time.

JOHN KING

Southern Rails on Southampton Docks including Industrial Lines of Southampton

— Ian Drummond

160pp, A4, 250 b&w and colour photographs, 43 maps and diagrams, hardback, Holne Publishing, PO Box 343, Leeds LS19 9FW, 2011, ISBN 978 0 9563317 4 8, £22.95 (plus £3 p&p)

This book is a companion volume to *Southern Rails Around Southampton including the Fawley Branch*, self-published last year by the author which described the history and development of the mainline railways in the Southampton area. Filling a gap in the earlier book, the present volume covers the all-important docks area, helping to complete a picture of how Southampton's railways were, and are, integral to the development of the docks and the city.

The book outlines the growth and operation of the railways as the docks developed over 150 years and takes us through the development of the railway system within the docks, covering both the original ones on the River Itchen and the later New Docks of the 1920s and 1930s on the River Test. It is in a semi-pictorial format, the high map content being notable in showing the stages in the development of the docks. They also clearly show the railway system,

which at its peak consisted of seventy-seven miles of track with nearly one thousand hand-operated points and no signals. The photographic content, which includes some ephemera, has good informative captions. Narrative chapters are concisely written and include the history and development, traffic and commodities transported, operation and train ferries, together with additional chapters on independent wharf tramways, each with their own maps and history.

Southampton has, deservedly, been well served by railway literature but this book is a further worthy addition to the canon. Aimed at the interested enthusiast, it is not claimed as a definitive history, but it will certainly serve as an excellent brief history until there is one. It gives a well-illustrated overall impression of the port itself though motive power, perhaps understandably, is particularly dominant.

BRIAN JANES

***The Golden Age of Air Travel* — Nina Hadaway**

56pp, 235x165mm, 68 illustrations, softback, Shire, Midland House, West Way, Botley, Oxford OX2 0PH, 2013, ISBN 978 0 74781 223 4, £6.99

Bradshaw's International Air Guide

176pp, 182x135mm, 1 map, hardback, Old House, Midland House, West Way, Botley, Oxford OX2 0PH, 2013, ISBN 978 1 90840 257 8, £10

Was there ever a Golden Age of Air Travel? Probably not, but in the latest Shire Library publication, Nina Hardman skilfully takes us from the beginnings of air travel in the 1920s, through the romance of the 1930s and eventually to the jet age of the 1960s. The beginning was certainly not romantic with toilets concealed by a curtain and little or no heating but by the 1930s air travel was much more comfortable, although only a minority could afford it. It was the jet of the 1960s that raised the glamour level of air travel.

As an instruction to the subject, the book is admirable. It was however not just the public that was — and still is — mesmerised by air travel. The author could have commented on the high failure rate of airlines and that so many people have always been prepared to put money into airlines without any hope of getting a return on the investment.

For most people with any appreciation of transport history, the Bradshaw name is indelibly linked with

British railway timetables, the last one appearing as long ago as 1961. But how many of us know that Bradshaw also published a monthly air timetable from 1934? It included airline services within the British Isles as well as services to Europe and further afield.

Essentially this is a facsimile reprint of the first issue in November 1934. For the student of air transport history, it is an indispensable document in that it reveals details of services and the structure of the industry in the so-called Golden Age. Most of the domestic airlines had only been formed that year, most of their routes being hopelessly uneconomic such as London to Plymouth by the short-lived Provincial Airways with a return fare of £5.95. The timetables remind us that the railways also had an airline but its routes were more sensible, such as Croydon via Liverpool to Belfast.

Whereas the original was soft back with thin paper, this informative reprint has a hard cover and quality paper. JOHN KING

***The Wrong Sort of Fish Oil: the trials, tribulations (and triumphs) of the early railway passenger* — M E Quick**

297pp, 234x155mm, 39 illustrations, paperback, Austin & Macauley, 25 Canada Square, Canary Wharf, London E15 5LB, 2012, ISBN 978 1 84963 174 7, £11.99

This book began as a by-product of the author's searches in newspapers and other contemporary sources for his work on passenger station chronology. His intention is to provide some idea of what matters were like for railway passengers — or 'a worm's eye view of the railways', as he rather cynically describes it — in the first half of Queen Victoria's reign.

It is arranged thematically in 22 chapters, many further divided by sub-headings — some 90 themes in all. So, although there is no index, it is not too difficult to find a particular topic. For example, the chapter on *Travelling — comfortably?* has sections on locked doors, extraordinary provision, first-class complaints, second-class complaints, third-class sufferings, and lighting and heating. *Stations* includes sections on conveniences and on friends and relations. The *Unwanted Companions* chapter is a mixed bag covering the themes of class distinc-

tions, excursionists, convicts and madmen. Tipping and smoking ('two rules made to be broken') merit their own chapter. The causes of accidents are dealt with at some length, with separate chapters on the allocation of blame, the treatment of casualties, and compensation.

These examples illustrate just some of the great variety of subjects covered. Many will accord with previous impressions of railway travel in the mid-nineteenth century, but there are the unexpected too. Such as the 1858 report of a (unique?) station with an all-female booking and telegraph office staff. Or the LNWR morning train from London in 1869 that was terminated at Warrington because no one wanted to go to Liverpool, thereby delaying the arrival of the London papers. Or the adhesion problems on the Holyhead line that were traced to liquid — the wrong sort of fish oil — dripping from wagons leaving the port. GRAHAME BOYES

Bridgewater 250: the archaeology of the world's first industrial canal

— Michael Nevell & Terry Wyke (Editors)

128pp, [size], paperback, Centre for Applied Archaeology, University of Salford, 2012, ISBN 978 0 9565947 1 6, £10

The Bridgewater Canal is 250 years old and deserves its place in history. This collection of essays by a number of contributors is an excellent summary of the past twenty years of archaeological and historical research into this primeval canal. The volume is nicely produced and contains a wealth of little-seen illustrations in the form of plans, drawings and photographs. Each of the well-crafted and wide-ranging essays could stand alone; taken together they cast new light on many fascinating aspects of the Bridgewater Canal.

The initial chapter, which establishes the context and says that the canal was an attraction for industrialists and tourists from its very beginning, is followed by a potted statutory history, ending with the flurried attempts at staving off competition from the Manchester Ship Canal in the late 19th century. An essay on the 'Ingenious Devices' recorded by Arthur Young in 1770 captures details of some of the structures associated with the canal, including waterwheel-powered mills and cranes as well as emergency stop-gates and a sexfoil weir designed by Brindley. An important and fascinating essay on recording sunken barges in Boothstown Basin

points out that the archaeology of vernacular inland waterway craft in the UK is in its infancy. An exploration of the extraordinary engineering of the Worsley mines and underground canals is followed by a virtual tour of Worsley village and its industrial remains. Further chapters consider the archaeology of the Castlefield terminus, the Grocers' Warehouse, which was the precursor of other similar canal warehouses and indeed of railway transshipment warehouses, the Barton Aqueducts, and the impressively engineered 28½ mile branch giving access to the sea via Runcorn which was developed as an inland port.

A popular image of the Duke of Bridgewater is that of a reclusive figure, but surely this is wrong. He was an energetic, risk-taking businessman with a touch of genius. The modest wall tablet in Little Gaddesden church where he lies buried, translated from the Latin, reads, 'He sent barges where formerly the farmer tilled his fields'. He did indeed, as this important volume of essays admirably demonstrates.

NIGEL CROWE

[This is an edited version of the review which appeared in *Industrial Archaeology Review*, the journal of the Association for Industrial Archaeology, in November 2012]

***Waterways Journal (Volume 15)* — Cath Turpin (Editor)**

76pp, 199x210mm, 80 illustrations, paperback, The Boat Museum Society, South Pier Road, Ellesmere Port CH65 4FW, 2013, ISSN 1466 3732, £6.99 (or £9 including p&p) from Dr Di Ascott, National Waterways Museum, Ellesmere Port, CH65 4FW, <www.boatmuseumsociety.org.uk/publications> or from the museum shop

This issue contains five diverse articles:

- The steam tugs which hauled coal to the gas works and power station in Norwich from the 1890s to 1961 are recalled. Agricultural produce and textiles were exported; Colman's mustard factory was also served by water.

- The tug *Ralph Brocklebank*, built in 1903 for the Shropshire Union, was later sold to the Manchester Ship Canal Company and from 1936, modified and renamed as *David Adamson*, served as the company's directors' launch. Retired in 1985, she is subject to preservation society ministrations.

- In 1928, Norman Anglin converted *Russian*, an ex Shropshire Union narrow boat, for habitation and, accompanied by Joyce Brown, embarked on an extended cruise. Respectively they recounted their experiences for the *Manchester Guardian* and *Motor*

Boat. Comparisons are made between Norman Anglin and Tom Rolt.

- Five generations of the Griffiths family had close connections to canal transport over a wide area of the Midlands and London. They included boatmen, canal carriers, boat builders, publicans, farmers and shopkeepers.

- Finally there is a précis of ship and boat building at Ellesmere Port. Beginning in 1812 and expanding in 1846 with the formation of the Shropshire Union, which had a large fleet to service, ship repair continued until 1969 when the pontoon dock, built 1893, was scrapped. The patent slip, circa 1846, is detailed.

This publication should appeal to all waterway enthusiasts.

JOHN HOWAT

Railways of Keith and Dufftown: the story of the railways in Keith and the line to Dufftown

— Keith Fenwick

64pp, 240x166mm, 70 photographs (8 in colour), 8 maps and plans, 3 facsimile timetables, gradient profile, paperback, Great North of Scotland Railway Association, North Cairncake, Cuminstown, Turriff AB53 5YS, 2013, ISBN 978 0902343 25 2, £6.90 (£8.50 including p&p from publisher)

Keith's importance as a railway centre came from its frontier position on the lines of the Highland and Great North of Scotland companies that formed the main Inverness–Aberdeen route. Extensions to the GNSR network, including to Elgin via Dufftown, and the opening of the HR Buckie branch, gave Keith Junction an important role as an operational centre. Both companies maintained separate locomotive sheds and goods depots there.

Early chapters cover the complexities of the railway development succinctly and clearly, from first proposals to the present day. Then follow a description of the line to Dufftown and short chapters on locomotives and rolling stock, signalling and train

services. Ian Hird contributes memories of operations during his railway career at Keith from 1962 to 1998, and the book concludes with a chapter about the Keith & Dufftown Railway Association's successful take-over of that line as a tourist operation and a look to the future of the local railways. There is a short list of sources and a bibliography.

This book is an updated version of *The Railways of Keith*, published in 2006, and extended to include additional illustrations. One of a series of attractively-produced short books from the GNSRA, it will specially appeal to those visiting the tourist railway who want to understand something of its history.

TIM EDMONDS

Beeching 50 Years On — Anthony Poulton-Smith

182pp, 233x155mm, 67 b&w and 18 colour photographs, paperback, History Press, The Mill, Brimscombe Port, Stroud GL5 2QG, 2013, ISBN 978 0 7524 8092 3, £ 16.99

The author argues that the Beeching Report probably did more than any other single factor to preserve the nation's railway heritage. To illustrate this point he describes sixteen former BR standard gauge lines which have become heritage railways, and a further seven now in use as cycling and walking routes. In their new role these railways have boosted the tourist industry and created many permanent jobs. Space allocated to the individual railways varies from one page to ten, and usually includes a detailed description of the line and sometimes historical background notes. There are no maps. Much interesting

information is given about running heritage railways, but there are a few errors and misleading statements which have escaped the proof-reader.

In addition there is a forty-six page list containing several stations named in the Beeching Report and which closed between 1964 and 1968. Often there present-day state is given also. Some station names have been abbreviated, giving the impression that towns such as Andover, Paisley and Wigan lost their only station at this time. This list seems an odd contrast with the theme of the rest of the book.

ALLAN BRACKENBURY

The Staffordshire & Worcestershire Canal ... as it was — Alan T Smith

44pp, 250x170mm, 74 images & 3 maps, paperback, Lapal Publications, 53 Senneleys Park Road, Birmingham B31 1AE, <www.lapalbooks.co.uk>, 2013, ISBN 978 0 9509238 5 7, £12

Anybody interested in canal history will find this selection of images of the Staffordshire & Worcestershire Canal a useful source. Alan Trevis Smith MBE has put together a collection of maps, photographs and postcards that follows the geographical route from Great Haywood to Stourport. Many of these images are rarely seen and include views of the canalside buildings at Aldersley, the

terminus of the Stafford Navigation, and trows in the upper basin at Stourport. Many images came from the collection of the compiler, who was in the process of completing this book, when he died. The final stages were done by his daughter, Heather. The careful choice of images used is a credit to the compiler's special knowledge of this waterway.

RAY SHILL

***The Industrial Tramways of the Vale of Llangollen* — J R Thomas & D W Southern**

72pp, A5, 74 b&w photographs, 10 maps, paperback, Oakwood Press, P O Box 13, Usk NP15 1YS, 2013, ISBN 978 0 85361 727 3, £9.95

The 25 miles of the Dee Valley either side of Llangollen had numerous tramways connecting extractive industries with the Holyhead Road, the canal or the railway. Slate came from Penarth Quarry, from Deeside and Moelferna Quarries and from Clogau, Oernant and Moel-y-fant Quarries. Limestone was quarried at Eglwyseg and Trevor Rocks and above Froncysyllte. The Ruabon Brook Railway was built by the Ellesmere Canal Company to link various mines and industries with the canal at Trevor Basin. J C Edwards' brick and tile works at Penybont was also linked to the canal by a tramway before its branch from the Great Western Railway was constructed. Some of the lines were short-lived, predating photography, and were missed by the map-makers. Others lasted much longer — one horse-drawn line

had a level crossing over the A5 as late as 1954.

All these (and a few minor tramways) are detailed in this book. John Thomas did the initial research, collected photographs, and did extensive fieldwork. Dave Southern later worked with him to turn the researches into a book, but regrettably John Thomas died shortly before publication.

The weakness of the book is that the minutes of the canal and railway companies have not been consulted, which particularly affects the content of the chapter on the Ruabon Brook Tramway. On the other hand, the photographs are fascinating, being full of interesting detail. The fieldwork is excellent, and one hopes that this will inspire readers of the book to explore this little-known industrial area for themselves.

PETER BROWN

***Ffestiniog Revelations: including the Talyllyn Railway in 1951* — Vic Mitchell**

DVD, running time 45½ minutes, Middleton Press, Easebourne Lane, Midhurst GU29 9AZ, 2013, reference code V001, £19.95

This DVD comprises largely home movies taken by Vic Mitchell, the founder of Middleton Press, and his family. The first eight minutes deals with the Talyllyn Railway in 1951. Then follows the story of the Ffestiniog from the first encounter in 1951 through to its eventual reopening in 1982. Four minutes cover a 1960 speeded-up 'from the cab' journey up the Ffestiniog as far as Tan y Bwlch, entitled *Atomic Run to Tan y Bwlch*, which is entertaining if jerky. The remainder consists of colour home films with some commentary by Mr Mitchell, or still photographs with his voice over.

Much of the content is idiosyncratic, but there are some interesting depictions and commentary. For instance, on the Talyllyn, Tom Rolt is shown at work, as is the crossing keeper Peter Jones, and the breakdown of the first ex-Corris locomotive. Unfortunately, the quality of some of the filming shows its vintage — flickery, faded and dark — and some scenes, like the Ffestiniog landscapes or personal family events, are of limited interest. The commentary is relayed in an unobtrusive 'fireside' manner, but some depictions require further clarification.

JOSEPH BOUGHEY

***Brunel's Atmospheric Railway; featuring the contemporary watercolours of William Dawson* — Paul Garnsworthy (Editor)**

104pp, 295x360mm, 25 watercolours in col. facsim., 126 illns (62 col.), 24 drwgs, 13 maps & plans, 3 facsim., 12 tables, paperback, Broad Gauge Society in association with The Friends of Devon's Archives, c/o Stevensbooks, Taddyforde House South, Taddyforde Estate, New North Road, Exeter EX4 4AT, 2013, ISBN 978 1 84785 037 9, available from <www.stevensbooks.co.uk> or <publications@broadgauge.org.uk>, £20 (plus £6 p&p)

Three of William Dawson's views-cum-strip-maps of the South Devon Railway when new between Exeter and Totnes were reproduced on the back cover of the July issue of the Journal. The originals are in the collection of the Institution of Civil Engineers. Now, thanks to the publishing partners, it is possible to study the complete set at leisure in this volume,

where they are reproduced in colour to a large format and accompanied with ample text and illustrations setting the line in both historical and modern context. Apart from the special interest of the SDR's abortive means of traction, the views portray something of the impact of an early mainline railway on the landscape.

MATTHEW SEARLE

Brief Notes

***The Isle of Man Railway: colour photographs 1963–1971* — Eric E Bird**

107pp, A4, 224 photographs (the majority in colour), 1 map, paperback, Peco Publications & Publicity, Underleys, Beer, Seaton EX12 3NA, 2013, ISBN 978 0 900586 43 9, £14.95.

As a youth the author, a Manxman, toured his beloved IoMR, initially with a second-hand box camera, taking b&w photographs but soon graduating to a marginally more sophisticated camera and colour slide film. He rejected 70% of what he took, but now, 50 years or so later, he presents the best of the rest in this volume of remarkable, annotated vintage pictures, concentrating on those parts of the lines from Douglas to Port Erin and Peel reached easily by bicycle. If track diagrams and pictures of the railway infrastructure interest you there are none, but the pictures of the trains are first-rate.

An A-Z of Famous Express Trains: an illustrated trip down memory lane

— Julian Holland

192pp, 220x240mm, many colour illustrations, hardback, David & Charles, F&W Media International Ltd, Brunel House, Forde Close, Newton Abbot TQ12 4PU, 2013, ISBN 978 1 4463 0295 8, £19.99

***Dr Beeching's Axe 50 Years On: memories of Britain's lost railways* — Julian Holland**

192pp, 264x192mm, many colour illustrations, paperback, David & Charles, 2013, ISBN 978 1 4463 0267 5, £18.99

These two books of nostalgia will appeal especially to former trainspotters of the 1950s and 1960s. The first describes alphabetically 99 named trains of British Railways, devoting one or two pages to each. As an example, 'The Royal Duchy' which ran from Paddington to Kingswear/Penzance has its history described with a short piece of text illustrated by the winter 1958/9 timetable, a copy of the 1959 restaurant tariff, a close-up of the headboard and two action photographs of the train in the late 1950s and in 1961. The book is highly attractive, particularly enhanced by the reproduction of ephemera associated with these titled trains.

The second book is naturally a more sombre offering yet made readable again through its clever design and concise text. The lines are grouped by geographic region and described chronologically by their closure dates, illustrating each by a well-chosen evocative photograph, many of which are of last-day trains. The book's introduction explains the

context and impact of the Beeching report but then the accent is on recalling the railways rather than analysing the reasons for their closure.

***Ayrshire's Last Days of Colliery Steam* — Tom Heavyside**

48pp, 168x238mm, 51 b&w photographs, 1 map, Stenlake Publishing, 54–58 Mill Square, Catrine KA5 6RD, 2013, ISBN 978 1 84033 620 7, £9

Deep mining in Ayrshire is now a thing of the past but this excellent album of photographs of industrial steam locomotives at work in the 1960s and early 1970s will bring back memories for many readers. The photographs, which are crisply reproduced, are accompanied by the author's extensive captions. There is a chapter on three of the local locomotive manufacturers (Andrew Barclay, Grant Ritchie and Neilson) which provided the bulk of those featured in the book including some unusual types. Only occasionally does one of those rude diesels intrude into the background!

***A Guide to the Industrial Archaeology of Tayside* — Mark Watson**

80pp, A5, 160 illustrations (mainly colour), 10 maps, paperback, Association for Industrial Archaeology, 2013, ISBN 978 0 9560251 2 8, available from Roger Ford, AIA Sales Officer, Barn Cottage, Bridge Street, Bridgnorth WV15 6AF, £5.50 (plus £1.10 p&p)

Each year the AIA produces an authoritative well-illustrated gazetteer for the area of its conference, this year comprising Dundee, Angus, The Mearns and North Fife. Of the 224 entries (some for multiple sites), 49 are related to transport: 16 railways, 18 road and other bridges, 12 docks and harbours, and an airfield, a tram shed and a canal. Yes, a canal — a short canal dug about 1495 to allow Admiral Sir John Wood to travel from his castle to Largo Church on Sundays, the traces of which can be seen in the manse garden (map reference NO 4213 0363).

***Rail Atlas: Great Britain and Ireland* — S K Baker**

128pp, 243x172mm, hardback, Oxford Publishing (an imprint of Ian Allan), Hersham KT12 4RG, 2013, ISBN 978 0 86093 651 0, £17.50

The 13th edition of this indispensable guide to the current rail network, including tramways and preserved railways, has been updated to include recent developments such as the re-opened Airdrie–

Bathgate line. It also includes numerous changes proposed for the next couple of years and shows the draft route of both phases of HS2. An extra colour has been introduced in this edition, new railways and stations being shown in brown; regrettably, if you suffer from the commonest form of colour-

blindness, the result can be virtually indistinguishable from some of the other lines. The wealth of detail is admirable but this has meant that London, in particular, has become so complex that it would be desirable for the scale of the maps on these pages to be increased in the next edition.

The following 'Middleton' books: 96pp, 236x166mm, about 120 photographs plus maps, timetables, tickets etc, hardback, Middleton Press, Easebourne Lane, Midhurst GU 9AZ, £16.95 (post free)

Chester to Warrington via Frodsham

— Vic Mitchell & Keith Smith

2013, ISBN 978 1 908174 40 6

The terminal points on this busy line, most of which was originally part of the former Birkenhead Railway and later under the joint management of the GWR and the L&NWR, get generous treatment but the long closed intermediate stations at Daresbury, Dunham Hill, Halton, Mickle Trafford and Norton (Cheshire) are not ignored. The illustrations of the railway crossing the Weaver and the Manchester Ship Canal will please the waterway enthusiasts.

***Walsall Routes* — Vic Mitchell**

2013, ISBN 978 1 908174 45 1

This volume illustrates thirty stations of three pre-grouping companies in the northern part of the Black Country and the Cannock coalfield, the routes comprising Lichfield to Dudley, Rugeley to Walsall and Priestfield to West Bromwich, together with various links. Diagrammatic maps from various sources are helpful in interpreting the complexities, and the Ordnance Survey maps reveal much, not only about the railways, but also about the canals and industries.

The following 'Through Time' books: 96pp, 235x165mm, about 180 illustrations, paperback, Amberley Publishing, The Hill, Merrywalks, Stroud GL5 4EP, 2013, £14.99

***St Pancras Station Through Time*
*Waterloo Station Through Time***

— John Christopher

ISBN 978 1 4456 0921 8 and 978 1 4456 1022 1 respectively

The Waterloo volume covers the Necropolis Station, the Waterloo & City terminus and Waterloo East, but pictorial coverage prior to its reconstruction from about 1910 is limited. St Pancras fares better: it is portrayed during construction and the former freight facilities are included. The magnificent Grand Hotel is displayed both as built and as restored. Although the Eurostar aspect of St Pancras is celebrated, that formerly at Waterloo tends to be underplayed. The areas surrounding both stations are not forgotten: the Festival of Britain and the British Library both receive attention.

Oxfordshire Railways Through Time

— Stanley C Jenkins

2013, ISBN 978 1 4456 1001 6

This collection of 'then and now' photographs has all the 'thens' in sepia and all the 'nows' in colour. Captions are detailed and informative. All the lines

there ever were in Oxfordshire are covered thoroughly. Most of the 'then' pictures are of stations and the 'nows' are of the same view today — with or without station. There are some reproductions of tickets and of old working timetables. There are some unfamiliar old pictures of the Wantage Tramway motive power and some unlikely pictures such as one of the bodies laid out in the neighbouring paper mill after the Hampton Gay crash of Christmas 1874.

The London to Brighton Line Through Time

— Simon Jeffs

2013, ISBN 978 1 4456 0979 9

An historical overview of the 'Brighton' from the early days down to privatisation is followed by a survey of the lines from London Bridge and Victoria to East Croydon and then on to the coast. The photographs are well-chosen (the most recent date being February 2013), the captions succinct, and informative and infrastructure receives as much attention as locomotives and trains. A comprehensive bibliography is included. One of the best in a variable series.

Publications of the Railway & Canal Historical Society

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