

JOURNAL

of the

Railway and Canal Historical Society

Vol.9. No.5.

September 1963

PRESIDENT - Charles Hadfield
VICE-PRESIDENTS - C.R.Clinker and H.A.Vallance
CHAIRMAN - C.F.Klapper

HON. SECRETARY

John Bryant
26, Clarence Street
Ulverston
Lancashire

HON. TREASURER

C.P. Weaver
4, Queen's Close
Kenilworth
Warwickshire

HON. EDITOR

J.G. Spence
Tuborg Halt
34, Manor Avenue
Caterham, Surrey

JOSEPH LOCKE IN THE WEST MIDLANDS: A MYTH EXPLODED

by J. Horsley Denton

Comparatively little has been written of that early railway engineer Joseph Locke (1805-60) but almost invariably the few accounts that exist of his work refer to his alleged aversion to tunnelling and major works and the consequent cheapness of his routes at the expense of gradients and detours. Whatever may be the truth of this in his work elsewhere, it certainly was not true of his efforts to link Shrewsbury with the Black Country between 1839 and 1845 where his plans called for considerably greater works than those of his competitors.

Of the five schemes placed before Parliament prior to the building of the Shrewsbury & Birmingham Railway opened in 1849, Locke was first in the field with a plan deposited 1 March 1839 to link Shrewsbury with the Grand Junction Railway near Wolverhampton. The latter town stands on a hill and the railway avoids the worst of it by passing round its north slope. Locke's plan, however, boldly aimed for the centre, passing over Wellington Road (now Waterloo Road) and entering a tunnel on a curve short of North Street to emerge 440 yards further on just before crossing the Birmingham Canal.

This same plan called for a tunnel of 880 yards at Oakengates on the site of the existing tunnel but far longer, and the gradient of Albrighton Bank, built as a long pull at 1 in 100, would have been relieved if Locke had been successful in 1839 with the aid of a further tunnel at the summit of 449 yards at a lower level as the line crossed from Shropshire into Staffordshire. The proposals of other engineers did not call for a tunnel here.

This was an isolated scheme. There were no others to go before Parliament before 1844 when Locke again entered the field, in opposition to the Shrewsbury & Birmingham company who had, in short time, failed to come to terms with the Grand Junction company (whose line was, of course, one of Locke's great works), and who were therefore compelled to promote their line through to the other side of Birmingham. This was to connect with the London & Birmingham line near Curzon Street after passing through a tunnel of 708 yards terminating beyond Nova Scotia Street. It might have been the prospect of additional heavy engineering works under Birmingham that caused the latter company to try to economize between Shrewsbury and Wolverhampton. This is most unlikely, for the Provisional Committee of the Shrewsbury & Birmingham were full of ambition and their 1844 plan included an extension northwards to Chester, another westwards to Newtown via Criggion and Welshpool and four branches in the Black Country. The fact remains that Locke's rival plan called for far greater works and consequent easing of gradient and route.

This second proposal gave Locke an opportunity to grow even bolder. His earlier tunnel of 440 yards under Wolverhampton was now increased to 520 yards occupying roughly the same position but emerging beyond instead of before the Birmingham Canal. His opponents fought shy of such a prospect, and the Shrewsbury & Birmingham plan under the authorship of Sir John Rennie and Captain W. S. Moorsom called for a wide detour south of the town centre to cross the lower end of Darlington and Salop streets and the Penn Road south of St. Paul's Church.

On Albrighton Bank, Locke's 1844 scheme called for deep cutting and high embankment on the fall to Codsall giving gradients travelling eastwards of 1 in 140 up and 1 in 990 down in comparison with the 1 in 100 up and 1 in 183 down as built. Only at Shifnal, where later schemes went right over the town did the Locke plan appear to confirm the reputation ascribed to him by so many writers, but even here there were complications in his apparent detour.

Although only five schemes went before Parliament in all, there was a sixth plan which was also drawn up in 1844. This carried in the title the names of Sir John Rennie as Principal Engineer and Mr C. J. Blunt as Assistant Engineer, and was the first plan of the Shrewsbury & Birmingham company when they initially hoped to connect with the Grand Junction Railway at Wednesfield Heath station near Wolverhampton. It followed almost exactly the first of the Locke plans (1839) and both made a wide detour of Shifnal to the south, as did also Locke's second plan (1844, the same year). The only variation of note in the three was that the

Rennie and Blunt scheme round Shifnal was to pass north of The Hem, while Locke proposed to pass south of The Hem and return to the general line near Cosford by tunnelling under Brimstree Hill for 170 yards. Once again, Locke is found to be advocating tunnels and complications considered unnecessary by his competitors.

It was the second set of 1844 plans of the Shrewsbury & Birmingham company drawn up by Rennie and Moorsom that first proposed to take the line over the centre of Shifnal. These plans had been drawn up in considerable haste. As late as 4 November that year, the S & B Committee were still considering reconciliation with the Grand Junction, and the Committee Accounts that have only recently come to light tell of deputations on that date, discussing the position with Robert Stephenson on behalf of the London & Birmingham, and with his even more famous father George, who had been "authorized on the part of the Grand Junction Directors to carry out an arrangement".

In the light of subsequent events, it is easy to deduce from these records that the London & Birmingham and Grand Junction companies were beginning to shake off some of their former enmity and were advancing towards the amalgamation which brought about the birth of the L.N.W.R. on 16 July 1846. But the Shrewsbury & Birmingham either could not or would not see this, and in their panic to get their plans deposited before that memorable final date of 30 November of that year of many Bills, they went ahead with the revised and extended objective of Curzon Street, Birmingham, to by-pass the necessity of collaborating with the Grand Junction. This revised plan incorporated the extensions to Chester and Newtown and branches already mentioned, and also, for the first time proposed, as a result of a request from the townsfolk of Shifnal, to take the line over the town by the present system of high embankment, bridge and viaduct. There was a tremendous panic to get the plans printed in time, and the Accounts tell of numerous visits to printers in many places to get them to assist in the "circumstances of pressure". With a battle headquarters set up in the Stork Hotel, Birmingham, lengthy accounts of clerks working day and night checking the Books of Reference, and with the aid of special trains, the necessary documents were duly deposited before the House and, with the aid of special messengers, with the widely dispersed Clerks of the Peace. There was no keeping of office hours on that night of 30 November and in some cases plans were deposited with only minutes to spare before midnight.

Thus, by the end of 1844 we may summarize the comparison between Locke's schemes and those of his competitors in this area by saying that in every one he called for more elaborate earthworks and more tunnels, the only possible exception being the somewhat ambitious competing scheme for carrying the line over Shifnal. But even in this last, it is unlikely that his motive was due to any timidity as we shall see when we come to 1845, the last year of proposals before Parliament gave its assent and work began.

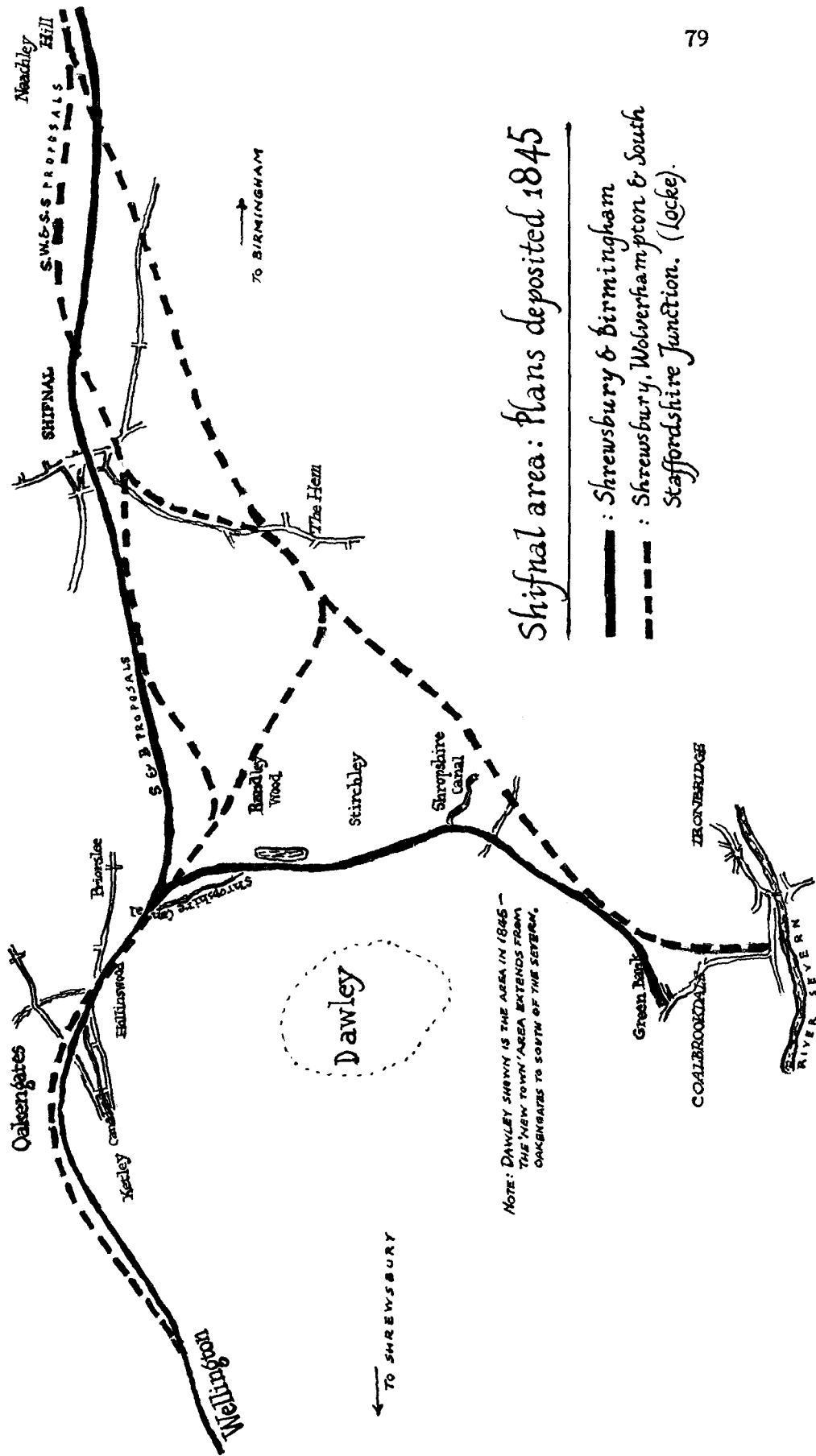
In that final year of deliberation, the rival companies both deposited plans. The Shrewsbury, Wolverhampton & South Staffordshire

Junction Company's plan under the hand of Joseph Locke was deposited on 29 November. The Shrewsbury & Birmingham Company's plan now carrying the signature of Robert Stephenson and W. Baker was duly deposited on the following day. Both Bills were accepted by Parliament and received their Royal Assent on 3 August 1846, becoming 9 & 10 Vict. Caps. 308 and 307 respectively. But this did not foretell a duplication of lines. The twenty-first clause of the Shrewsbury & Birmingham Act says "And whereas a Bill is now pending before Parliament for making a Railway called the Shrewsbury, Wolverhampton & South Staffordshire Railway the objects of which are identical or nearly so..... as relate to this line between Shrewsbury and Wolverhampton" and it went on to decree that the powers conferred by such a Bill would not come into effect for two years and that if at the end of that time the Shrewsbury & Birmingham had either begun or completed the line under their powers, the S.W. & S.S. powers of construction would become void. The Act also made it lawful for the two companies to amalgamate "for the purpose of building the railway" under the above conditions.

And so it came about that the Shrewsbury & Birmingham company won the day. But the line as built was different in a number of respects from the plans that were passed, and in the case of the branch to Coalbrookdale, the company had to obtain additional powers at a later date to modify them considerably (Vict. 10 & 11, cap. lxxx 2 July 1847).

Before the modified branch to Coalbrookdale was eventually constructed from Madeley Junction and opened to Lightmoor in 1854, the Shrewsbury & Birmingham planned to reach the Dale by a line that would have been a remarkable combination of two later lines. Their branch, authorized in 1846 in their original Act, would have left the main line at Hollinswood just east of Oakengates tunnel and for the first half of its journey would have used the old bed of the Shropshire Canal where the L.N.W.R. a few years later used it for their Coalport line. It would then have turned west and on a very easy gradient, would have passed into the Dale, and terminated by the present Green Bank Halt.

But this simple and inexpensive proposal for a branch was far removed from the fantastic rival scheme of Joseph Locke. In a final orgy of proposals, this man, with the alleged dislike of the costly and complicated, indulged in a swan-song scheme for the area that would have turned the peaceful Shropshire countryside into something approaching a miniature Crewe. Only one feature of his plan is easy to understand, which was his reason for making a detour round Shifnal. This was to facilitate a junction, just south of the town, of a branch to Coalbrookdale. But that was not all. In about a mile, the branch would have joined another branch that had left the main line from Wolverhampton at a point south of Neachley Hill, and almost immediately afterwards yet another branch would have left this line to run north-west to join up with the original main line again, south of Priorslee. This gives altogether five junctions in the Shifnal area ! Not content with this, and unlike its competitor, Locke's branch would not have stopped short by Green Bank Halt just above the Coalbrookdale Company's furnaces; that was much too simple. It was to terminate by the River Severn near the Coalbrookdale Company's wharf, by descending steeply after



Shifnal area: Plans deposited 1845

- : Shrewsbury & Birmingham
- - - : Shrewsbury, Wolverhampton & South Staffordshire Junction. (Locke).

passing through a tunnel of 396 yards at the north end of the Dale. Once again, Locke was calling for tunnels and complications where competing schemes were of a vastly simpler character.

We may never know why one of the greatest engineers of his day advocated such comparatively high expenditure in this area. It might have been better if his advice had been followed, for apart from easier running his lines would have avoided other pitfalls. In Oakengates tunnel for instance, Locke planned to pass 44 feet under the Ketley Canal and 39 feet under the Shropshire Canal. Instead, the Shrewsbury & Birmingham built their line as near to the surface as they dared, and even at the opening, the Illustrated London News on 17 November 1849 reported that some people had expressed fears for the safety of the tunnel but that "Mr. Stephenson has inspected the tunnel ... and reports that it is perfectly safe". Six years later, in October 1855, the canal broke through the lining and the whole three miles of its summit level emptied into the town of Oakengates via tunnel and station yard. We do not know what Mr. Stephenson said when he heard about it. Neither do we know what Mr. Locke said if he heard about it. Only one thing is certain. If Joseph Locke's work elsewhere justified that feature of his character so many writers have ascribed to him of parsimonious avoidance of major engineering works, then his efforts in Shropshire were entirely at variance with his activities elsewhere.

* * * * *

KING'S WEIR AND LOCK

by Hugh Compton.

On the River Thames, $3\frac{1}{4}$ miles above Oxford, lies King's Lock and its adjacent weir. Above the lock craft can either proceed up river to Eynsham and Lechlade or turn to the starboard along the Wolvercote Mill Stream and through Duke's Cut on to the Oxford Canal.

The oldest records show that a weir belonging to the nuns of the Benedictine Abbey at Godstow existed here in 1189, this being in connexion with fishing, but the first known records of its being used for water transport are contained in the Rolls for Merton College, Oxford wherein mention is made in 1310 and 1331 of stone from Taynton being carted to Eynsham thence by water to the Hythe, a wharf near the present Hythe Bridge, Oxford.

After the dissolution of the Abbey in 1540 the weir and Wolvercote Mill passed through several hands until they came into the possession of the Duke of Marlborough.

The question of building a pound lock was considered by the Duke as early as 1782, a millwright having estimated that he could build it for £248 and an additional £100 would be required for repairing the weir.

The Thames Navigation Commissioners resolved in 1818 to build one "as soon as sufficient money can be raised", but there the matter rested until 1928, when the present King's Lock was made by the Thames Conservancy Board.

The management of the weir by the owners of the mill caused a number of disputes. In 1813, one Williams of Wolvercote took legal proceedings against the lessee of the mill for failing to draw up the sluices when the river rose to high water mark. The offence was proved, and the fine of £10 was divided between the Thames Navigation Commissioners and Williams.

In 1823 the Thames Navigation Commissioners went from Oxford by water and there they met Mr. Swann (of the mill) by appointment at King's Weir; examined the bargemen and others as to the operation of the weir upon the navigation and also discussed the subject at great length with Mr. Swann. The committee found that the work which they had recommended had been done, but that the sluice gates had been useless for some years. They also found that the pen gates of the river had been very considerably raised above the former level, by which combined causes, in conjunction with Mr. Swann's refusal to draw the water when the necessities of the navigation required it, the barges were constantly stemmed up.

The committee, therefore, recommended that the regulation of the gates should be placed under the care of the Commissioner's Officers. But, four years later it was reported to the committee that the sluices, which were put in by the commissioners had been spiked up and rendered unfit for the purpose for which they were intended. The General Surveyor was instructed to put them in order straight away and to make an immediate report to the commissioners in the event of their again being injured, in order that the parties might be dealt with accordingly with the utmost severity of the law.

In 1842 Swann put in a new gate at the weir, and the Navigation Commissioners complained that the sluices were about 8" higher than those of the old gate and required him to lower them.

The Thames Navigation Act of 1865 required the owners of King's Weir to open the sluice gates to let boats pass and twice a week for a spell of three hours to fill the lower reach; during this period work stopped at Wolvercote Mill.

About this time the Thames was allowed to silt up between Oxford and King's Weir and the depth of water over the sill at King's Weir was only 2'9" compared with the present day 5'6", as a result narrow boats went by way of the Oxford Canal. By arrangement with the boatmen the manager of the mill stopped the flashes so that the mill worked continuously, in 1861 it was stated that "no Canal Boat or Barge has passed down the said River (with the exception of two or three barges partly loaded with timber and two or three Canal Boats with coals) during the last two years". But not long before 1872 Mr. Campbell of Buscot Park, and others prevailed with the Thames Conservancy Board to restore the navigation

of this part of the river.

The Thames Conservancy Board reconstructed King's Weir in 1872, thereafter the owners of the mill periodically agitated for the building of a lock, but the Thames Conservancy Board wanted the mill to bear the whole of the cost.

In 1872 there was still a cottage on the east side of King's Weir. The Thames Conservancy keeper in 1912 could remember an old woman, who lived there 60 years before. She looked after the weir, and boatmen went to her cottage to borrow a lever to work the winches. At that time the weir had a pair of gates exactly like gates of a lock, with sluices in them, and worked by winches and chains. The cottage had gone by 1885, when the Thames Valley Drainage Board bought the weir for £5 and thoroughly repaired it, but the plot of land on which it stood was still part of the mill property.

Just prior to 1872 a boat slide was built beside the weir and in 1909 a towing path bridge was erected.

The present lock (113'1" x 16'4") was completed on 29 May 1928 and a new Lock House was built about the same time. The land between the weir and the lock was set aside for campers.

The author would like to acknowledge the help given by The Thames Conservancy Board, Mr. H. Carter, Archivist, Oxford University Press, and Mr. W.J. Arkell.

* * * * *

ERRATA

May Journal p.44. 5th line of 3rd paragraph: for 1886 read 1866.

- - - - -

Jan. Journal Mr. M. D. Greville writes that the opening date of the L.C. & D. Brixton to Loughborough Junction section should be 1 May.
(1 July is correct for the Herne Hill-Beckenham opening).

* * * * *

The Editor is very grateful for the response to his appeal for material. So much has come in that he hopes members will understand if they are not published immediately. It is hoped that further material will come in to provide for future issues.

* * * * *

RECENT LITERATURE

William J. Skillern

- BAILEY, Trevor. Festiniog Railway guide book. [1963]
(Ian Allan, 2/6).
- BARKER, T.C. and ROBBINS, Michael. A History of London Transport: passenger travel and the development of the metropolis. Vol.1, The nineteenth century. 1963. (Allen & Unwin, 40/-)
- BOUCHER, C.T.G. John Rennie, 1761-1821: the life and work of a great engineer. 1963. (Manchester University Press, 28/-).
- THE CASE against Beeching. 1963. (Labour Research Department, 161 Drury Lane, London, W.C.2, 6d)
- DAY, John R. The Story of London's Underground. 1963.
(London Transport, 5/-)
- FORUM (magazine of the Railway Preservation Society). Quarterly, from Spring 1962. (Railway Preservation Society, 31 Old Croft Road, Walton-on-the-Hill, Stafford, 8d)

ARTICLES

- Dickens and the railway, by Robin Atthill. (In "English", Vol. 13, No. 76, Spring 1961)
- *To hospital by rail, by Laurence Dopson. (In "Hospital World", Vol. 2, No. 4, April 1963)
- *Hospitals and their railways, by Laurence Dopson. (In "Hospital World", Vol. 2, No. 5, May 1963)
- Navigation of the Yorkshire Ouse, by Baron F. Duckham. (In "The Dalesman", Vol. 25, No. 4, July 1963)
- *Stanier's Pacific steam locomotives. (In "Engineering", Vol. 195, No. 5064, May 10, 1963).

*These items are in the Society's Library.

* * * * *

TRACING THE OPENING OF A STATION

The difficulty in tracing the precise date of opening of an individual station in the early years of railways is well known. Frequently intensive research in every available source will not reveal the information and a first timetable appearance is left as the nearest guide.

A rather unusual instance was Bodmin Road, Cornwall Railway. Owing to some indecision at the time the line was being made, the most convenient site for the station had not been established, whether at Glyn Bridge (where it was eventually built) or at Respryn, three-quarters of a

mile nearer Lostwithiel. Meanwhile, the private station at Respryn, constructed for the Robartes family of Lanhydrock House, was used temporarily for public traffic. No clue as to when Bodmin Road (permanent station) was opened could be obtained from the official timetables because they showed "Bodmin Road" from the opening of the line in May, 1859 and no adjustment of times was made when the permanent station came into use.

An advertisement of the opening of Lanhydrock grounds to the public on 23 June 1859 mentioned that they were "contiguous to the Bodmin Road Station". This clearly indicated Respryn as still in use, since Glynn Bridge is nearly $1\frac{1}{2}$ miles from Lanhydrock House.

The next clue was a letter in the West Briton & Cornwall Advertiser complaining that only one omnibus met "the express" at Bodmin Road on 28 June 1859, despite this being the day before Cornwall Quarter Sessions opened at Bodmin. As a consequence, barristers, police and witnesses had to trudge up the hill to the town. Two weeks later the same newspaper published a letter in reply to this complaint. It explained that several other conveyances "had proceeded to Respryn Bridge to meet the train unaware that the station at Glynn had been put in use the previous day".

So Bodmin Road was opened to passengers on Monday 27 June 1859. It is interesting to note that this appears to be the only indication of this particular opening date. The minute books, Engineer's reports, etc. do not mention it. The opening for goods traffic on 2 December was, however, officially advertised in the several local newspapers.

from C. R. CLINKER

* * * * *

CORRESPONDENCE

The First G.W.R. Dining Cars

Sir, - In the footnote to the reference to early G.W.R. dining cars, in the July issue of the Journal, attention is drawn to an apparent discrepancy in Vol. II of MacDermot's History of the Great Western Railway. A list of errata, prepared by the author, shows that the statement on page 477 is correct, and that dining cars made their first appearance on the G.W.R. in May 1896, between Paddington and Bristol, and Paddington and Cardiff. These errata were published in sheet form by the Oakwood Press, about twenty-five years ago. These corrections considerably enhance the value of MacDermot's monumental work. If the publishers are no longer able to supply the sheets, perhaps a reprint could be considered. Alternatively, the Railway & Canal Historical Society might be able to arrange for them to appear in duplicated form in the Journal. Probably three quarto-size sheets would be ample.

H.A. VALLANCE

Railway Inaccuracies in General Maps

Sir, - Mr Denton's letter in the July Journal took my mind back to 1930-31 when I conducted a rather acrimonious correspondence with the Ordnance Survey on the subject of railway inaccuracies in its small-scale maps, in particular the 1-inch series. I suggested that the Ordnance Survey should employ someone with expert railway knowledge to "keep them on the rails". They dismissed the idea out of hand as being "impracticable" (why ?) and added that they considered the Department to be sufficiently well informed on this aspect. Maybe the idea was impracticable, but the need for expert advice is as great now as it was 30 years ago. There has been no improvement whatever in the standard of accuracy. The number of errors of all kinds on current sheets is quite astonishing. The instances of stations shown on the wrong side of level crossings, for example, runs into dozens, probably more. It has always intrigued me that the Ordnance Survey 6-inch and 25-inch plans of all issues should be generally so reliable (they do contain a few errors), yet the smaller scale maps are quite the reverse. No doubt there is some procedural explanation for this, but the disparity ought not to exist.

C.R. CLINKER

- - - - -

The Foxton (Grand Junction Canal) Incline.

Sir, - Shortly after writing the letter which you published on p.69 of the July Journal, I was unexpectedly able to consult the Engineering article referred to in connexion with the Foxton plane. Although basically correct, my description was at variance in certain details with this account and I trust that you will permit me to rectify the mistakes. The two caisson paths were staggered, the northernmost being set back a sufficient distance to allow for the staggered berths. Eight rails were arranged in four pairs on each of these paths and each tank supported horizontally on eight pairs of wheels. At the top of the incline, where the main tracks curved over with the hauling ropes, an outer pair of subsidiary wheels on each of the shorter upper legs engaged short sections of wider gauge track which continued the gradient and held the tanks level at the upper berths. They were sealed against the upper canal pound by hydraulic pressure applied through buffer stops at the outer ends. At the foot of the incline the tanks were simply submerged in the lower pound. Bradshaw's reference to five rails may have arisen through confusion with the hauling ropes, two of them supported on rollers between the outer pairs of rails. The balancing rope was fastened to the centre of each tank and on its additional set of rollers down the centre of each path might easily be confused with the rails in an illustration. A double-cylinder high-pressure jet condensing engine drove the two double winding drums through worm gearing and apparently operated on the outer ropes only, winding in at each end while it payed out from the centre. The engine also worked a hydraulic accumulator to power both the upper sealing stops and all guillotines. It had been recently constructed by Messrs J. & H. Gwynne

of Hammersmith to the designs of Gordon Cale Thomas, Grand Junction Canal Engineer, and of his brother James B. Thomas, to replace a staircase of ten narrow locks rising 75 feet. Besides saving a great quantity of water, the lift was able to pass a pair of boats in each direction in 12 minutes compared with the previous times of $1\frac{1}{4}$ hours for a single boat and another five minutes for a pair. On the first six months experience working expenses for up to 6,000 tons in a 12 hour day amounted to £1.4s.6d including the cost of coal, oil, stores and labour. It should be unnecessary to add that as boats were carried afloat and, according to Archimedes, displace their own weight, perfect balance is achieved in a lift or plane of this nature regardless of an even traffic flow or otherwise. Apparently traffic never reached the estimated peak, which envisaged a 15-minute cycle, and the locks came back into use after the plane's short life of ten years.

- - - - -

The Shropshire Planes

According to Raistrick, the original canal incline at Ketley differed from that at Trench in having a lock chamber at the end of the upper pound, the floor of which was formed at the same gradient as the incline. A certain amount of water was thus lost as the boat settled onto its cradle. The incline was double tracked and balanced, water losses being minimized by the use of a side-pond. It was presumably to avoid even this small loss that the boats were lifted over the sill at Trench and one wonders if the problem had already been solved on the Shropshire Canal planes ?

P. STEVENSON.

- - - - -

Inclined Planes on Canals

Sir, - In the July edition of the Journal, your correspondent Mr P. Stevenson makes some interesting and most intelligent assumptions regarding the Trench Inclined Plane. Unfortunately, owing to a captioning error in the book Dynasty of Ironfounders which is quoted by your correspondent, his deductions are entirely wrong. If Mr Stevenson reads again the article by Mr Williams, he will see references to boats passing over the sill, so that his remarks in this connexion are inapplicable as there was no question of doing away with a sill on five of the six planes in East Shropshire. His difficulty in understanding that the sill was no great hazard on these canals was probably caused by a failure to realize that these were tub boat canals for boats of only 19'6" or so in length which do not present the same problems as the usual narrow boat. Your correspondent was probably misled by the reference which he quotes to the "Ketley" Inclined Plane in Dynasty of Ironfounders. Knowing that the Ketley Inclined Plane had a lock in the top basin, he studied the drawing and made his deductions accordingly. Unfortunately this caption is incorrect. The engraving is taken from Plymley: Agriculture of Shropshire and actually shows one of the other inclined planes in the area - which one has not been ascertained - but it

is certainly one of the other five which were all similar in operation and differed from the first one, Ketley, which alone had a lock in the top basin. Had the publishers of Dynasty of Ironfounders selected the other engraving from this section of Plymley's Shropshire, which is much the better one, showing a section of the winding gear and basin, your correspondent would probably not have made the additional mistake of assuming that the boats floated down the planes in a caisson. The cradle holding them was merely a frame on wheels, and between passing over the sill in the top basin and descending down the railway into the bottom basin, the boat was, of course, on dry land. One further correction should be made: the sketch on p.29 although extremely crude (and I accept full responsibility for that) was a line sketch over the actual image of a photograph so that the outlines are entirely accurate. It shows, however, as stated at the foot, the Hay and not the Trench incline as the latter had already been illustrated in Williams' East Shropshire Canals. In this case, the top and bottom pounds were by no means in line, as suggested, there being sharp curves right by the incline basins, but of no difficulty to tub boats. Readers may be interested to know that the Hay plane is now being carefully 'dug' and measured by our Dawley Working Party from the West Midlands Group.

J.H.DENTON

* * * * *

LOCAL GROUP SECRETARIES

LONDON: J.A.Hall, Flat 3, 110 Crouch Hill, London N.8.

NORTH WESTERN: D.G.Rimington, 11 Cherry Tree Walk, Stretford, Lancashire.

NORTH EASTERN: *R.J.Hunter, Granby Lodge, Scarcroft Road, York. (*acting)

WEST MIDLANDS: J.H.Denton, Marchmont House, Church Road, Codsall, Wolverhampton.

EAST MIDLANDS: R.Garton, 49 Riverdale Road, Attenborough, Notts.

SOUTH WESTERN: D.Garnett, Pear Tree Cottage, Little Somerford, near Chippenham.

* * * * *

WAKEFIELD RELIC

A cast-iron lettered notice on the Down platform water-column at Wakefield (Kirkgate) station bears this wording:

"All drivers other than LMS men are required to place a water ticket in this box on every occasion they take water here".

* * * * *

THE LANCASTER CANAL TRAMROAD

by Gordon Biddle

A tour of railways in North Lancashire and parts of the Lancaster Canal is being arranged by the Society this month, so it is perhaps appropriate to publish a short history of the tramroad which joined the North and South Ends (as they were officially designated) of the canal.

The Lancaster Canal Company was incorporated by an Act of 1792 to construct a broad canal on a line surveyed by John Rennie, 75 miles long, from Westhoughton on the South Lancashire coalfield between Wigan and Bolton, through Chorley, Preston and Lancaster to Kendal in Westmorland. The Rivers Ribble and Lune were to be crossed by massive stone aqueducts, the former accompanied by 222 feet of lockage down into the valley, and further north on the Westmorland border a rise of 65 feet, the remainder being level. The object of the canal was to carry coal northward cheaply and bring limestone south, for which there was a respective demand in each district. The company spent most of its capital in cutting the sections from Preston to Tewitfield, north of the Lune Aqueduct and opened in 1797, and Bark Hill, near Wigan, to Johnson's Hillock, south of the Ribble, opened in 1799. Goods had to be laboriously carted by road over the intervening eight miles, and some coal from Chorley pits went by boat down the Douglas Navigation, up the Ribble estuary to Preston Marsh, and thence by road to the canal wharf at Spittals Moss just outside the town. Loss of tolls on the South End induced the canal committee to extend it another two miles to Clayton Green, to cut out the very worst of the road to Preston, and at the same time they instructed their Resident Engineer, William Cartwright, to prepare a fresh estimate for crossing the barrier of the Ribble.

At the half-yearly meeting on 2 July 1799, Cartwright gave his estimate for constructing locks, embankment and aqueduct at £172,945, and as a temporary measure advocated a tramroad to connect the two ends of the canal for £60,000, including extensions of the waterway from Spittals Moss to the northern edge of the Ribble valley at Avenham and Clayton Green to Walton Summit on the edge of the southern escarpment. From Avenham a double line tramroad would descend the steep bank of the river by an inclined plane to a timber bridge over the Ribble, followed by a 7' embankment across the water meadows to Carr's Wood, Penwortham, where a second incline would ascend 60 feet. Here the two lines would diverge, the southbound track continuing by three levels connected by two more planes, one near Bamber Bridge and the other at Walton Summit, a total rise of 215 feet. Some earthworks and a short tunnel would be needed to preserve the levels. The northbound line would descend from Walton to Penwortham on a separate course following the natural slope of the ground to enable it to be worked by gravity. The tramroad was to keep to the Parliamentary line of the canal except for slight deviations to ease curves and give an even descent. Cartwright proposed a gauge of

4'1 $\frac{1}{2}$ " and waggon 6' by 4' by 2' deep weighing 10 cwt tare and costing £14 apiece.

The Act of incorporation provided for additional capital of £200,000 by mortgage or subscription, but as the financial outlook was on the raw side it was decided that the only possibility of raising the money was in creating new £30 shares. Counsel advised that this was not legal under the 1792 Act so a further Act was obtained to this end on 20 June 1800. In their eagerness to finance a tramroad the committee seemed to overlook that the canal Act did not provide for an alternative mode of conveyance and it was not until an Act of 13 August 1807 was obtained for deviations in the Kendal line that a clause was inserted authorizing "railways or waggonways within the line of the canal".

Cutting of the extension to Clayton Green began in October, 1800, but a firm decision on the Ribble crossing had still not been made. There were three distinct factions within the company of proprietors: the original promoters from Lancaster, mostly merchants interested in increasing their town's trade; a Westmorland party which wanted cheap coal for Kendal and the Lake District; and the inevitable "Liverpool Party" common to so many canals and early railways, which included proprietors from Preston. The latter it was which constantly battled for a canal across the Ribble, losing no opportunity to point out that the costly Lune Aqueduct was comparatively little used, the bulk of the traffic stopping short at Lancaster. The prospect of a tramroad across the Ribble in their view appeared likely to delay even more the possibility of a through canal and in September Rennie wrote to Samuel Gregson, Clerk to the Company, stressing that a tramroad must only be a temporary expedient, as if allowed to become permanent it would eventually be an encumbrance - which it did, although by luck the company was able to get rid of it at the right moment. On 5 December Gregson wrote to a shareholder assuring him of the temporary nature of a tramroad in order to speed traffic and induce the opening of new pits on the South End. It would also be invaluable for carrying materials for the Ribble Aqueduct, he said.

The committee was still in two minds about it in March 1801, when they asked Rennie and William Jessop to report on the problem. The two engineers submitted their conclusions on 12 May and after giving again detailed recommendations for a stone aqueduct and embankment as the only permanent solution, went on to advocate the immediate but temporary expedient of a tramroad. They discarded Cartwright's system of separate roads and instead proposed a straightforward double track following the Parliamentary line, 4 $\frac{1}{2}$ miles long, with inclines at Avenham, Penwortham and Walton Summit, the former worked by a steam engine and endless chain but the other two perhaps by counterbalancing rising and descending wagons on the self-acting principle. Nevertheless they provided for three engines in their estimate of £21,600. A general meeting on 7 July authorized construction and Jessop was paid a fee of £70. Rennie, as Engineer to the company, received rather more. His account was credited with £112. 5s. 4d.

Land was quickly purchased and Cartwright went over to Derbyshire to study the Peak Forest tramroad. On his return he suggested that the tramroad should be taken on from Avenham into Preston to meet the canal rather than the reverse, as there was more room for warehouses and accommodation on the company's land near Fishergate. This was adopted, a single line tunnel being necessary under Fishergate. A sectional drawing of the tramroad by Cartwright, dated 1802, shows L section tramplates with the gauge between the facing edges of the flanges as 4'3", but this has been altered in pencil to 4'1", which is the distance stated in the company's book of specifications. The width between the two lines of plates was 3'8" and the entire roadbed was 24' between the drains.

Each tramplate was specified to be cast of best No.1 pig iron, not exceeding 40 lb. per yard, and the dimensions were: 3' long, $3\frac{1}{2}$ " broad on the bearing surface, $\frac{1}{2}$ " thick, flange 2" high at each end bowed upwards to 3" at the centre, and a $1\frac{1}{2}$ " deep rib on the underside. Two $\frac{3}{8}$ " by $\frac{1}{2}$ " countersunk recesses were to be cast in each end so that two plates butted together would form holes for the iron "gad nails" or spikes which secured them to the sleeper blocks. The suppliers were to keep the plates in repair for the first twelve months. Stone blocks were quarried near Lancaster, 16" to 20" long, 12" broad and 8" to 10" thick with two holes bored for the spikes. By May 1803, 10,500 had been prepared at 5d each.

Work on extending the canal to Walton Summit was hampered by trouble in cutting Whittle Hills Tunnel, but by January 1802, the extension of the North End from Spittals Moss was ready. Next month contracts for tramplates were advertised and in April the committee ordered 300 tons from the Aberdare Iron Co. at £10. 10s. Od. per ton with a reserve on another 100 tons if they were satisfactory. The next lowest tender was from Aydon and Elwell of Shelf Ironworks, near Bradford, who were told they could supply 100 tons if they would deliver at £10. 15s. Od. per ton, to which they agreed. Walton Summit Basin and the incline roadbed were ready and Cartwright was ordered to obtain an engine and endless chain. Whether one was erected is doubtful, as nowhere else in the company's minutes is an engine referred to at Walton and I suspect that this incline was worked by horses, or perhaps counterbalancing. I hope further research will give the answer.

Late delivery of the plates from Shelf caused more delay, while those supplied by the Aberdare Co. were 8 lb. overweight yet so badly cast that they broke under a $3\frac{1}{2}$ tons test load. "I never saw any castings so badly executed", wrote Cartwright to Gregson in October, "I confess if they had been moulded in Gravel instead of Sand they could not been rougher handled and the metal of it self is the worst I ever saw, a specimen of which I send you to lay before the Committee". They were not accepted and fresh tenders were sought from Sturges & Co. of Bowling Ironworks, Bradford, The Halton Iron Co., Lancaster and Rigby's of Howarden. Sturges & Co. agreed to supply 100 tons at £10. 15s. Od. per ton.

The roadbed was now ready, with sidings laid out at various wharves, ("splice roads" Cartwright called them), 1,400 yards long in all, for

which inferior rail sorted out from deliveries was used. Extra strong rails were used at road crossings. The company's records do not give details of the inclines but some impression can be pieced together from scraps of information among the minutes. The length of Avenham incline was 115 yards on a gradient of about 1 in 6, the lower wheel being on the end of the wooden bridge over the Ribble. A 6 h.p. engine (Rennie and Jessop had advocated only $3\frac{1}{2}$ h.p.) with 13 in. cylinders cast by Wilkinson of Wrexham drove the endless chain, performing 40 strokes per min. As it is stated that each engine cost £350 and the engine house, rollers and gear £450, presumably identical plant was erected at Penwortham Incline, which was 165 yards long. A horse path ran alongside each incline. At the insistence of Sir Harry Houghton of Walton Hall the Avenham engine was designed to consume its own smoke. The canal had an odd pair of names for the two tracks, the northbound one being called "the coal or descending road" and the southbound one "the limestone or ascending road", after the principal traffics carried in each direction.

In June 1803, when Whittle Hills Tunnel was finally complete, the Blackburn Mail recorded the passage of the first train, or "team" as they were called, as far as Bamber Bridge. "On the first instant, a Boat laden with coal was navigated on the Lancaster Canal thro' the Tunnel at Whittle Hills, and her cargo was discharged into waggons at the termination of the canal at Walton. Twenty seven waggons were laden, each containing about one ton, and were drawn by one horse, a mile and a half, along the rail road, to the works of Messrs. Claytons, at Bamber Bridge. The waggons extended one hundred yards in length along the rail road, Geo. Clayton of Lostock Hall Esq., rode upon the first waggon and the tops of the others were fully occupied. The intention of navigating a boat through the Tunnel, upon this day, was not generally known; it was quickly circulated; old and young left their habitations and employments to witness a sight so novel, and before the Boat reached her discharging place, she was completely crowded with passengers, who anxiously rushed into her at every bridge. The workmen were regaled with ale at Bamber Bridge; and among the toasts of the party were given, 'The glorious First of June', 'The Memory of Lord Howe', and 'The healths of the surviving heroes of that memorable day'". The reward of the horse for pulling such a load is not mentioned, although even if the gradually falling gradient did not demand much exertion, the number of wagons still seems somewhat suspect.

The "coal road" was completed through to Preston in November and the southbound road early the next year, but on 19 January Cartwright died, probably of overwork, as in addition to supervising construction of the tramroad and the general working of the canal he was currently engaged on the installation of a 70 h.p. pumping engine and tunnelling a shaft for drawing water from the Ribble for the canal at Preston. He was an able engineer, having superintended the building of the footings and underwater piers of the Lune Aqueduct and had designed several ingenious devices for the canal company.

At first a duty of 1s. per ton was levied on coal carried on the tramroad, plus 4d per ton for the use of a company wagon if the trader had none of his own. Later these charges were consolidated into 4s. per

wagon (which at that time carried 2 tons) for a round trip, the company keeping the wheels oiled and repaired, the trader to maintain the rest. Traders' own wagons had to be marked by a letter and number on an iron plate provided by the company, who kept a register of wagons in the same way as with canal boats. Later the tonnage rates were revised on the lines of the canal rates and incorporated in the company's full scale, but continued to be charged separately for the tramroad. The rates in 1819 for a cargo of coal carried throughout, for instance, were 1½d per ton per mile on the South End, 1s. per ton flat charge on the "rail-way" (as it was then called), and 1d. per ton per mile on the North End. The tramroad rates were graduated from Walton - 4d per ton to Bamber Bridge, 6d. to Todd Lane, 8d to Penwortham and 1s. to Preston.

Wharves and warehouses gradually were extended as traffic grew and a map of Preston of 1824 shows the single line emerging from Fishergate Tunnel to meet the canal end-on, with a left hand branch to a side basin and a right hand branch to seven coal yards or "hurries" lining Fleet Street at right angles to the canal. The 6" Ordnance Survey Map of 1845 shows that this had grown to a fan of sidings criss-crossed by standard gauge railway lines, and at Walton Summit there was an elaborate layout of sidings alongside the two outer basins of the canal, connected to the up and down inclines.

Continuing experience produced bye-laws for regulating the tramroad working, in a piecemeal fashion at first but later properly drawn up and published in notices. The first to be enacted directed that only "shunts", i.e. crossover roads, were to be used for transferring wagons from one line to the other, at least four being provided along the route. Originally wagons were permitted to load to 2 tons but frequent tramplate breakages dictated a 1 ton limit. Six "small" wagons or four "large" wagons were allowed in a train and the incline enginemen were under penalty to enforce observance. Upon complaints from traders that their "halers" (wagon drivers) were demanding 25% wage increase through having to make more journeys to carry the same loads, the committee relented to the extent of permitting 25 cwt per wagon. It was not uncommon for a driver to continue to haul derailed wagons along the roadbed if he could not be troubled to re-rail them, and if he did make the effort as like as not he would use his horse to drag them back forcibly on to the line one by one to the detriment of the plate flanges. Both practices were subject to a 5s. fine, it being stipulated that re-railing must only be done with levers. In 1828 a bye-law was introduced prohibiting drivers from "sleeping in a waggon or otherwise not attending to his horses".

(to be concluded)

FOR LOCAL GROUP SECRETARIES SEE PAGE EIGHTY-SEVEN