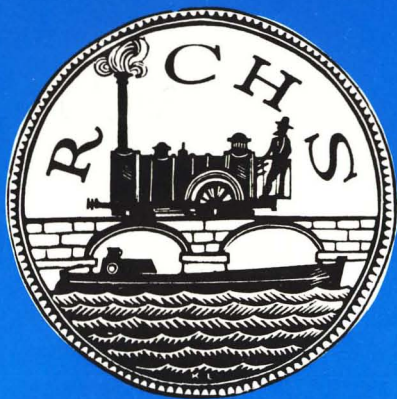




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The Growing Pains of a Railway

BY REX CHRISTIANSEN

Victorian railway history was full of verbal battles between companies, big and small, often with the larger ones getting the upper hand, although not on every occasion. The early battles between the North Staffordshire Railway and the London and North Western, formed only three weeks afterwards, are a little known classic. While researching for the history of the North Staffordshire Railway, which I wrote with R.W. Miller (David and Charles 1971), I noted from the NSR board minutes, details of the first clashes, which are only briefly outlined in chapter 3 of that book.

The story shows how the early policies of the NSR were guided and guarded by its outstanding chairman, John Lewis Ricardo, who was at the helm from the company's birth in 1846 until 1862. The LNWR and the Midland Railway both tried to restrict the NSR's territorial ambitions, but they turned out to be not the only enemies of the NSR directors, for militant shareholders were quick to act when they did not like the way the company's affairs were being directed. The first major 'revolt' took place in 1850.

Militant Shareholders

The board's failure to establish satisfactory relations with the LNWR led to a militant group of NSR shareholders forcing an internal investigation. Aably led by a major-general, John Briggs, they managed on 30 January 1850 to get a shareholder's committee appointed to investigate the accounts, contracts and expenditure of the company since its formation.

There was also to be an inquiry into relations with other companies to see if any 'retrenchment' (was such a military term the general's?) was needed in salaries, expenditure or the construction of branches.

The committee, which consisted of seven members (four appointed by the general), was given power to examine books and papers of directors and officials; and the cost of the inquiry was to be defrayed from company funds.

The report was not ready when thirty shareholders next met on 3 April and Ricardo complained angrily that nothing could be more injurious to the undertaking than that such a matter should be hanging over it. While suspicions attached to the conduct of the directors, the undertaking could not obtain its proper value in the market.

He repudiated an insinuation that the directors had even entertained the idea of shirking by unfair means from any part of their responsibilities, or from the result of the investigation to which, he stressed, they had voluntarily submitted themselves.

Ricardo stated: 'It would be unworthy of any man with the slightest pretence of independence of character. There was not one of the directors who would have lent themselves to such a proceeding.' The directors, he added, were not conscious of anything to be ashamed of and at the proper time and place they were prepared to defend everything they had done.

A Liverpool shareholder, Wyllie, was also concerned that while important negotiations were proceeding with the LNWR, they appeared to be a divided body. He did not think the directors would have committed 'so suicidal an act as to impede the report.'

Ricardo replied that 'We are doing all in our power to induce the committee to produce their report as early as possible.'

The directors' actions were also defended by Adamthwaite, acting for a committee of Manchester shareholders.

He said that if he saw anything wrong in the conduct of the directors he would be the first man to displace them, but their statements had always been so fair and candid that he could not withdraw his confidence from them.

The chairman said he had called in the accountants, Messrs Quilter & Bell, to investigate the directors' accounts.

The shareholders' committee was not without its own critics. After the chairman said he understood it had met for eleven days at Stoke, one shareholder pointed out that this was in a period of two months.

Asked why some of the committee members were not present, Ricardo said he believed they intended no disrespect. They probably thought the meeting would be formal and attended only by a few people and that nothing would be expected of them. There was laughter when, in answer to a further question, the chairman said he was in a difficult position in having to defend the committee!

There were cheers when the chairman refuted a suggestion that any director had been connected with the iron trade and a contract for iron.

While the meeting did nothing to lift the cloud hanging over the company, the end was near and the battle petered out in an unusual way at the summer shareholders' meeting on 24 July at a time when the struggle for survival against the LNWR was paramount.

Ricardo reported that despite all the troubles, the company had achieved a balance of £7,860. At first he was gentle but firm in his attitude towards the rebels. While the directors were contemplating various measures for 'retrenchment' of expenditure and for encouraging mineral, goods and passenger traffic, they would not adopt the shareholders' suggestions for adjusting methods of accounting. Neither would they deal with 'contradictory and inaccurate' statements made by the shareholders' committee. But they were prepared to meet their proprietors with undiminished confidence and to defend and vindicate in every respect their management policy from the formation of the company to the present moment.

What they had done, stated Ricardo, they had done advisedly; nothing had been concealed or extenuated; and it was apparent that the charges had not been substantiated. The insinuations were unworthy and unfounded.

That having been said, General Briggs seconded a motion expressing the shareholders' 'high opinion' of the board and 'full confidence in their upright and honorable conduct in the management of the affairs of the company.'

With the inquiry behind it the board started trying to repair the damage which the investigation had caused. Ricardo cited one instance which surrounded a new agreement reached with the LNWR on 13 April.

'The directors were bound to admit,' he said 'that under ordinary circumstances they would not have submitted to some of the concessions contained in the final agreement; but with a committee sitting in avowed hostility, one at least of whose members had been in correspondence with the L&NWR Co., and a public meeting called by the committee, and to be held in London on the very day when terms must have been agreed upon or an amicable arrangement would

have become impracticable, it was felt impossible to hold out for terms which, under the circumstances, the strength of their case would, perhaps, have justified them in demanding.'

While the NSR felt it had secured a good source of revenue it also complained of shortcomings. It had not secured access to Derby or Manchester or obtained 'such facilities at the junctions to enable them to double local traffic.' They had been compelled to limit their activities to a vigilant superintendence of arrangements as they existed when the joint committee of officers was first appointed.

The treatment that the NSR was receiving from the LNWR led Ricardo as an MP to introduce in 1850 a Bill for Traffic Regulation. It sought to make it compulsory for companies to stop passenger trains at all junctions and provide branch connexions and to provide through coaches from other systems if there were sufficient demand. If trains arrived late at junctions and missed connexions specials were to be provided at the other company's expense. Ricardo also wanted power for the provision of proper accommodation for passenger and goods at junctions; for companies to exchange timetables and for passengers and goods to be sent by the shortest routes and equal rates and fares charged by companies.

It was not a popular Bill.

The LNWR chairman, G. C. Glyn, claimed that it would interfere too much with detailed management. The GNR chairman E. B. Denison, while against the Bill itself, thought the Government might introduce a more general one. The President of the Board of Trade, H. Labouchere, said that would have to be based on the recommendations of the Railway Commissioners and, unfortunately, they were unpopular.

Although the Bill was rejected on its second reading, it remained a forerunner of the Traffic Regulation Bill introduced by Edward Cardwell as President of the Board of Trade only four years later.

The NSR's own problems of this period were reflected in dividends and that of 1850, although only 1 per cent, was to remain the only one of note until 3 per cent was achieved three years later.

Fighting with the Midland

Further complaints against the LNWR breaching the agreement came at the shareholders meeting on 31 January 1851 when the chairman reported receipts of £10,591 17s 1d from through Manchester traffic. They were, he said, receipts affected by the absence of reasonable facilities and also by heavy charges made by the Midland Railway on the 'other side' of NSR territory.

These are worth considering in detail as they are another example of how powerful companies always made weaker neighbours pay heavily for developing even the most limited sources of extra traffic.

The NSR got the concessions only after a feud at Derby and Burton, brought to a head in 1851, when it accused the Midland of keeping traffic away whenever it could.

This included routing Derby–Liverpool traffic through Tamworth – a circular route twenty-one miles longer; insisting on maximum goods and passenger tolls for traffic to Burton and Derby, (in some cases 50% higher than the NSR rates), and of making 'exorbitant' charges of £2,000 a year for station accommodation

at Burton and Derby. The NSR decided it would be cheaper to build its own lines and maintain its own stations in these towns, basing estimates on the Midland charges in 1850.

For its traffic in the last half of that year the NSR paid the MR

	Derby	Burton
	£	£
Passenger and parcels	1,600	166
Goods	700	770
Rent	750	250
	<u>3,050</u>	<u>1,186</u>

After doubling these figures, the NSR concluded that it could save £2,480 at Derby; £1,472 a year at Burton. It estimated that it would cost £50,000 to build a line from Willington to Derby. Expenses equal to 5 per cent would amount to £2,500 a year. The wages of a station-master, signalman-clerk and four porters would total £420 a year; and maintenance, taxes and sundries would amount to £700: a total of £3,620.

The cost of a line to Burton	was estimated at	£4,000
5 per cent of cost		200
Wages of 2 clerks, 5 porters		400
Cartage		120
Maintenance and sundries		180
		<u>£4,900</u>

The threat was sufficient and the Midland soon agreed to economies to save the NSR upwards of £3,000 a year.

At Burton, the Knotty became friendly with the South Staffordshire Railway, later to merge into the LNWR. There was no physical connexion because of an intervening stretch of the Midland Railway. The chief clerk of the newly opened SSR was G. P. Neele, later to earn fame as the LNWR Superintendent of the Line. In his memoirs he relates that the SSR had to cultivate the NSR goods and passenger traffic, but the strongest link between the companies, which 'did not have much in common' was through Henry Wright, who supplied the SSR with rolling stock.

During some of the SSR locomotive difficulties, says Neele, 'we had occasion to fall back on the North Stafford and the Oxford, Worcester & Wolverhampton to work off accumulations of traffic to avoid blockades.'

The Derby and Burton disagreement was the first and last with the Midland, but those with the LNWR were interminable. When the LNWR changed its own traffic arrangements late in 1850 it agreed to a new joint committee being formed to try and foster better relations. It obviously achieved little, for at the next NSR shareholders' meeting on 31 January 1851 Ricardo insisted that they were not being given reasonable facilities, as only three trains each way stopped at Colwich. Extra Macclesfield branch trains were slow and did not make connexions. Through traffic was obstructed because passengers still had to change at every junction. Traffic between Manchester, Derby and Eastern England was being diverted via the Manchester, Sheffield & Lincolnshire and cattle traffic from Liverpool to Derby and Eastern Counties was being sent by Blisworth and Oundle. The LNWR had 'omitted' to hand over receipts for Manchester mails and deductions made for terminal charges were beyond the

specified amounts. It was also contended that the LNWR persistently refused to entertain any other points concerning relations.

Talks between the chairmen resulted in the appointment of an arbitrator — and fresh trouble. For while the NSR drew up a Deed of Reference, the LNWR objected to some points which the NSR considered essential to successful working. Faced with expensive litigation to enforce the agreement, or an application to Parliament, the NSR directors chose the latter, and shareholders approved a Bill on 31 January.

The NSR was never short of the advice of shareholders who sometimes presented their case in printed pamphlets such as that 'by one of themselves' which offered 'A Few Words to the Shareholders of the NSR on the true policy of that company, especially in relation to the LNWR'.

The author felt it would be best to get rid of the disputed agreement and leave each company 'at perfect liberty to pursue the course it thought best.'

'We have constructed our line without any of those great sacrifices to which many other companies, for want of sufficient capital, have been compelled to make recourse. The railway is entirely our own and whatever the line makes will be our own also. We stand on solid ground'.

He claimed that local traffic was steadily increasing and pointed to the North Western troubles:

'No-one can travel on the LNWR without being satisfied that some change must take place before long, and it is scarcely possible to conceive that the company will be able to do without us eventually. Their main line is even now very inconveniently encumbered with trains and the evil will continue to increase day by day until it becomes intolerable to the public.'

Supporting the directors' assessment a year earlier of the value of a branch to Marple, the shareholders argued that it would scarcely be possible to overrate its importance. The population of thriving new districts around Hyde, Newton and Compstall Bridge would soon require an outlet to the south in the direction of Marple and if the NSR did not build a branch, another company would.

Further south, the impending development of a line from Bedford to London would help the NSR and the GNR would be soon extended to Leicester, which already had a connexion with Manchester.

Amalgamation with the LNWR could be made only on equal terms. The NSR should not enter into an agreement which would prevent it making a branch to Marple. It should also form alliances with other companies, as the chairman had proposed.

The Bill to enforce the traffic agreement never got to Parliament because of arbitration by the Recorder of London in summer 1851. One point he examined was LNWR arrangements for stopping trains at Colwich, which he considered to be satisfactory.

But the NSR remained frustrated and felt the development of an independent line between Manchester and London would be the best way of getting the Agreement honoured and the chance soon came to exploit a situation potentially dangerous to the LNWR. It was created by the gauge war raging as the GWR drove north from Wolverhampton. It was reported to shareholders on 29 January 1852 that a line had been surveyed from Colwich across the rich mining district of Cannock to the GWR and the Oxford, Worcester & Wolverhampton at Wednesbury and Wolverhampton. To complement this and

provide a threat to Liverpool, the NSR sought to revive the line planned from Sandbach to the Birkenhead, Lancashire & Cheshire Junction Railway near Warrington.

The gauge was to be mixed so that the GWR could extend through the Potteries and have a route to Merseyside not greatly longer than its rivals.

The NSR was to have running powers over the BL&CJ to Birkenhead and also over the Warrington & Altrincham Junction and its associated line, the Manchester South Junction & Altrincham.

The NSR was ready to welcome the GWR into the Potteries because of the outlets it would provide into South Staffordshire. The deputy chairman, Broderick, stressed that it was impossible to overrate the importance of this and reminded shareholders of the solidarity of their position. The line was secure from encroachment while their capital was unencumbered by guarantees. 'In this respect the condition of the NS Company forms a single exception to that of almost every other railway undertaking in the kingdom'.

The Wolverhampton and Cheshire extensions were approved by NSR shareholders on 5 May 1852, despite critics who said they would involve heavy outlay without the prospect of adequate return.

Attempts at Amalgamation

The critics won, not through their own action, but because the threat of new routes to Liverpool brought the LNWR to its negotiating senses. Differences between the companies went to fresh arbitration by Robert Stephenson and James A. Hope.

Five months later, on 6 October, they advocated that the LNWR should acquire the NSR paying a dividend of 3 per cent the first year, 3¼ per cent the second, and 3½ per cent every successive year. Capital was to be taken as £2,826,000 and the LNWR was to take over the Trent & Mersey Canal paying the canal dividend and all debts up to a limit of £1,050,000.

Both companies were to apply to Parliament for powers and if their applications failed three times 'the engagement' was to cease.

Not all NSR shareholders liked the idea and a new pamphlet was circulated by one who claimed that, by giving six months notice, the LNWR could at any time convert the NSR share capital into its own ordinary stock at par. And while NSR shareholders would be bound by the terms, they would not be binding to the LNWR.

The arbitrators seemed to want to unite them with the LNWR on the principle: 'If things turn out well all the improvement to them' while NSR shareholders were confined to a low fixed payment. On the other hand, if things turned out ill they had lost control. Their pittance would be stopped and they would share their loss and then be constituted as their partner.

He felt it was the wrong time to apply for amalgamation as Parliament had just appointed a select Committee to consider the entire question.

There was stronger and more influential opposition from the canal shareholders, who feared the amalgamation would cause a big loss of their traffic. The NSR offered to lease the canal to shareholders 'on reasonable terms'. The canal interests rejected the move, claiming the rent was too high; the time for consideration too short and there was no means of obtaining sanction in the current Parliamentary session.

With amalgamation in the air, the NSR asked the LNWR for directors' passes. The response was an example of the offhand treatment which the LNWR sometimes gave its neighbours. For while the NSR asked for the passes from 1 January 1853, only a fortnight after they made their request, the LNWR did not reply until 18 January when its benevolence was confined to members of the joint committee. Soon afterwards, however, it relented and issued passes to all the NSR directors and the secretary, valid until 1 August.

The gesture did nothing to prevent the acrimony and the NSR soon complained that no trains had been transferred over its system although it felt Manchester—London trains could be diverted via Stoke without extra cost.

Captain Huish resisted, contending that with the need to secure amalgamation in the present session, it would be imprudent to make any 'large changes'. Other amalgamation preparation included the introduction of fortnightly traffic conferences at Manchester and, by consent, the LNWR appointed Bidder as assistant manager of the North Staffordshire district from 1 August at his existing salary.

An investigation into the transfer of the NSR share transfer office to Euston, showed it would not be worthwhile. Huish and Bidder were authorized to arrange cheap tickets and excursions — but a marginal note declared this to be *ultra vires*. Someone was rushing too fast!

These were decisions made (or not made) while the Select Committee was still sitting. It had been appointed because of strong agitation following several big merger proposals including one for the LNWR and the Midland and the critics case was strengthened by the NSR scheme. The preparation of the Bill went ahead although shareholders rejected a clause concerning the exchange of stock — a point made in the shareholders pamphlet.

The Select Committee sat under the chairmanship of Cardwell as President of the Board of Trade and when it reported against amalgamation, the LNWR and NSR withdrew their Bill. This led to the NSR asking on 26 April to retain Bidder, but shortly afterwards, on 29 June, he resigned to join the Canada Trunk Railway. The goods superintendent, Myles Pennington, also went to Canada and became well known before he died in 1896. Bidden and Pennington both joined the NSR from the Preston & Wyre Railway. Forsyth took over as manager, as well as engineer, of the NSR and Miller became joint superintendent of goods for railway and canal, a post he held up to his death five years later.

Once the amalgamation Bill had been withdrawn, the NSR and LNWR immediately prepared a second application for the next Parliamentary session and started improving working arrangements.

On 2 June the NSR board *directed* the managers of both companies to prepare a scheme for mutual through workings and a through parcels service. The former were agreed at a special meeting at Euston a week later, but they involved only the night goods each way between London and Manchester, and before their diversion the LNWR demanded an improvement in the NSR permanent way. Its maintenance, then being carried out by Henry Wright as contractor, was handed over to the LNWR from 1 July.

Platelayers cottages were bought from Wright, and Charles Woodhouse, who had looked after the permanent way for Wright, was transferred to the LNWR.

Further through workings were agreed on 4 July and although they were again only for the LNWR (there was no mention of any reciprocal ones for the NSR),

relations were friendly enough for the NSR to transfer to the LNWR ten horse boxes and ten carriage trucks.

Financial Strength

However much the nature of negotiations changed, the NSR's greatest strength always lay in its comparatively sound financial position and this was strengthened dramatically when on 29 July 1853, Ricardo announced the best ever dividend of 3 per cent — 'with the hope of more.'

He wrote: 'It may be as well to repeat that the dividends will be increased to 3¼ per cent in 1854 and 3½ per cent in 1855, and in all future years.' But while serving to indicate the NSR could do as well by itself as by amalgamation, Ricardo was, in fact, pressing for better terms at a time when the second amalgamation Bill was before Parliament.

'Under any circumstances a very large increase in local traffic averaging upwards of £1,000 a week is a sufficient guarantee of the prosperity of the undertaking and if not promising immediate security equal to 3½ per cent preference stock of the LNWR Co., at all events demonstrates its safety in value as an investment.' The second Bill was no more successful than the first as it was barred by the 'Cardwell' Act (the Railway and Canal Traffic Act 1854) which stemmed from the Select Committee on amalgamation.

Relations again became delicate and a complaint about the LNWR not paying accounts for the Manchester through traffic was crossed out of NSR minutes of 16 January 1854 before they were signed by Ricardo.

In March when shareholders asked for nothing more than the publication of traffic returns, the board felt it necessary to consult the LNWR, although the minute added, rather pompously, that the board did not feel justified in withholding them.

The NSR board was concerned at this time about schemes for 'independent enterprises' or branches, which might be built and grafted on to the main line and which the company might be compelled to buy later at a price far beyond the cost of construction.

NSR shareholders watched every move in relations with the LNWR and took their own initiative in petitioning the LNWR to reconsider traffic arrangements. The LNWR replied on 15 April 1854 that it would not get involved as the petition had also been sent to the referees.

The LNWR was not the only company to 'try it on' with the NSR, for on 11 May Watkin, the MS&L chairman asked for 'an arrangement' of canal tolls as the price for preventing opposition to the NSR bills before Parliament. Ricardo told colleagues that as Watkin's letter was, for some reason unknown to him, marked private and confidential, he was unable to lay it before the board, but after he had explained its purpose, members thought it appeared Watkin was under a misapprehension regarding the distances of routes.

Despite all its troubles, the ever increasing prosperity of the NSR was something which the LNWR could no longer ignore and on 25 May 1854 it was forced to revise its amalgamation terms to provide a 3½ per cent dividend for that year and 4 per cent for succeeding years. NSR shareholders were also given the option of converting their holdings into LNWR stock on equal terms. These terms were included in a fresh joint application for amalgamation which NSR shareholders approved the following day.

The board renewed its offer to lease the canal to its shareholders, this time making the proviso that the rent might be determined by arbitrators appointed, if necessary, by the Board of Trade. While this application was still under consideration railway shareholders were told on 27 July 'that working arrangements are now in the same manner as if the amalgamation had been completed by the passing of the Act.'

Yet all was not well and in November the canal interests rejected the idea of a lease, but the board persisted in its offer and included a clause in the Bill to allow the canal interests to take a lease if they wished.

The 3½ per cent dividend promised by Ricardo 18 months earlier was announced on 30 January 1855 when amalgamation was projected by the board as something which, apart from economy and advantage to the public, would allow the completion of many projects and place the Potteries permanently on the 'high road' between London and Manchester.

But several big companies were not prepared to see so lucrative a system as the NSR fall into LNWR hands and their opposition of the GWR, MS&L and MR was strong and determined.

Ricardo Resigns

About a fortnight later, the board was shocked when Ricardo resigned, both as chairman and as a director. The trouble arose not internally, but because the Staffordshire Potteries Chamber of Commerce stated it would only agree to amalgamation with the LNWR if the NSR reduced tolls on the carriage of all the staple commodities of the Potteries. Ricardo's letter of resignation, written in London on 19 February, reiterated that the board's policy from its very origin had been to identify the undertaking with the LNWR so that instead of existing only as a branch labouring under every obstacle and impediment to the development of its resources for the benefit of the public and the Potteries, it would be acknowledged as the channel for the main stream of Manchester traffic. Any promise to reduce tolls would be against the interests of shareholders.

While accepting Ricardo's resignation, colleagues hoped that they would have his valuable assistance and advice whenever he felt able to give it.

Thomas Broderick, the new chairman, was quickly faced with unexpected difficulties when the Amalgamation Bill was rejected by a Commons Committee on 15 May 1855. It said that the promoters had not made out a case for placing the T&M Canal in the hands of the LNWR. It felt the preamble to the Bill not to be proven, without even hearing the opposition case.

Arguments now developed about whether or not that had been the third application. The LNWR felt no further application was either 'required, expedient or justified'; while the NSR regarded a fresh attempt as a matter of course.

The dispute was thrashed out in letters between the LNWR chairman, Lord Chandos, and Broderick who wrote: 'Surely it is a violation of all reason and a misuse of the language' to consider that the first Amalgamation Bill, which the companies withdrew, had been rejected. Many amalgamations had taken place since.

Meanwhile, traffic arrangements continued satisfactorily, although the LNWR did withhold payment of tolls claiming non-cooperation by the NSR.

Faced with many problems, the NSR board decided to invite Ricardo to return 'as circumstances had materially changed.' The first approach, made after a board meeting of 24 July 1855, was rejected but Ricardo changed his mind a few days later after shareholders joined the directors in offering him every support and adequate remuneration. He was re-elected chairman on 31 July, but did not take his seat until 10 September.

Immediately on his return, Ricardo referred to a possible successor to himself while not naming anyone. He firmly re-asserted the helm by pointing out that the board's future policy must be governed by circumstances which might arise in discussions with the LNWR. He instructed the solicitors to tell the LNWR that if it withheld payment of money due for running over the NSR it would not be expedient to declare a dividend at their meeting tomorrow.

The LNWR replied that it saw no reason to give its solicitors any special instructions and regretted that the NSR had put the matter in the hands of theirs, instead of trying to arrange an amicable settlement through the joint committee.

This was seen as a hardening of the LNWR attitude and the NSR immediately issued a writ for £37,704 6s 11d, the balance for through traffic in the half year up to 30 June 1855. The NSR solicitor was ordered to repeat an application for an Amalgamation Bill in the next Parliamentary session.

This was backed up by action on a number of schemes, notably a link to the Oxford, Worcester & Wolverhampton at Wolverhampton, and, for the third time an extension planned to Liverpool. The NSR engineer was instructed to survey a line from Sandbach to the St. Helens Railway and a survey was to be made on behalf of the NSR for an extension of the St. Helens Railway from Garston to Liverpool.

Plans described as 'Liverpool Extensions' were completed by 1 November and showed that from the Sandbach branch it was to cross the LNWR south of Sandbach station, run east of Middlewich and Northwich and follow the T&M canal to join the Birkenhead, Lancashire & Cheshire Junction Railway at Daresbury south of Warrington, a total distance of 19 miles 17 chains. From north of the Mersey access to Liverpool was to be over the Warrington & Stockport Railway, which had a branch running south from Warrington, and the St. Helens Railway. Both companies were to have powers to contribute to the construction of the line from Sandbach and there were to be running powers over these lines and, as in 1851, also the BL&CJ. They were also to embrace the Manchester South Junction & Altrincham as an associate of the Warrington & Stockport.

By the beginning of 1856, fire had gone out of all plans and on 17 January the board was told that as the LNWR had again refused to promote an amalgamation Bill, it had been withdrawn to avoid further expenditure. Although the LNWR had refused to answer the NSR writ, it had paid £6,900 into court and made thirty-nine pleas to mitigate the NSR claim.

It was not quite the end of the Knotty's Liverpool aspirations for a month later Ricardo said he was in touch with the GWR chairman, Denison, about the joint promotion of what he termed 'Liverpool extension lines.' He was given a free hand to negotiate as he thought best.

The Cannock Mineral Railway

Moves towards a link with the OW&W seemed more solid and followed an approach on behalf of the Cannock Mineral Railway by the engineer, John Addison. The scheme dated back to the formation of the Derbyshire, Staffordshire & Worcestershire Junction Railway, authorized on 2 July 1847 from the South Staffordshire Railway at Cannock to the Trent Valley at Rugeley and the NSR at Uttoxeter. It lay dormant through lack of funds until the company changed its name by Act of 14 August 1855.

Even though this Act abandoned the Rugeley—Uttoxeter section and gave the CMR power to lease or sell to the LNWR, its approach to the NSR met with an enthusiastic reception.

Addison proposed on 9 February 1856 that the NSR should maintain and work the CMR for 50 per cent of the gross receipts. The CMR's case was that it would give the NSR two advantages: providing new local traffic and an independent outlet from the Potteries to southern England. He estimated surplus annual profits which the companies would share at a minimum of £2,660. The NSR would get a further extension without any guarantee or charge on fixed resources, and clearly with prospects of gain.

The move came to grief when despite NSR support, the Commons rejected the Cannock Bill. Not easily defeated, both companies agreed in October of that year to seek powers in the next Parliamentary session for a double line from Flaxley Green to Cannock and also to alter the original route so as to join the NSR instead of the Trent Valley at Rugeley. There were also plans for an extension to Wolverhampton — and detailed alternatives prepared — in case the alterations were not sanctioned.

The NSR were to have a 5—4 majority on the board under the agreement, proposed by the Cannock's chairman, William Malins of London.

When it was reported on 10 March 1857 that the CMR was unable either to carry out the agreement, or to prosecute its Bills in Parliament, the NSR offered to do so, providing the undertaking was transferred. The NSR immediately planned an extension from Colwich to Wolverhampton and hoped for more time for completion.

But two months later on 10 May the NSR directors were shocked to hear allegations that the CMR had made an agreement with the LNWR. They protested that it would be in direct violation of the existing contract.

Soon afterwards the Commons refused even to hear the NSR evidence against the CMR Bill.

Faced with this rebuff the NSR decided there was no point in spending money on a lost cause and in July agreed to the deputy chairman and other directors resigning from the CMR board as its chairman had requested.

The LNWR had snatched victory by simply offering CMR shareholders a slightly better guarantee of 5 per cent. One of the last shots in the affair came on 10 March 1858 when the NSR resisted a move by the CMR for the compulsory purchase of land to take the line over the T&M canal.

When the line was completed between Cannock and Rugeley on 7 November 1859, it was leased to the LNWR from the opening day, and vested in the company on 12 July 1869.

By accepting defeat over the CMR 'snatch' the NSR avoided further bitterness with the LNWR and a lasting peace between the two companies was now very near — apart from a strange and final storm in the LNWR camp. It flared up over an agreement, very much a personal one, it seems, between Ricardo and Lord Chandos. Ricardo called a board meeting on 6 July 1858 to show the agreement to his colleagues. He was obviously pleased for it was recorded that he held it 'in his hand'. He was given authority to take any action he thought fit to settle differences that might arise out of it, but he was powerless to act when it was rejected by the LNWR directors who said it appeared to be unduly onerous to the company in pecuniary terms. Ricardo commented that he had thought it impossible that the LNWR board could even contemplate refusing to honour the signature of its chairman and support the policy he had adopted in a matter of 'great importance'.

An example of the mixed-up pattern of company relations of those years was demonstrated by the actions of the NSR after fire badly damaged Baswich Bridge on the LNWR main line near Colwich on 21 September. The North Western was offered 'every facility' for its main line traffic. Yet only two days later the NSR switched its London traffic over the MR and GNR via Derby and Bedford into King's Cross. The diversary arrangements with the LNWR lasted for 15 days: that with the MR a lot longer: until 8 February 1859 when the NSR through services returned to the Colwich route, although another month elapsed before Euston—Manchester expresses again ran through the Potteries.

While relations remained strained, the NSR also threatened the LNWR once again with a Liverpool extension. Ricardo reported the re-opening of negotiations on 27 October, although it is not clear whether they concerned the building of a new line or simply running powers over those of an un-named company.

Nothing more was heard of the scheme because of an agreement incorporated in an NSR Act of 13 August 1859, which put an end to the worst years of enmity by consolidating traffic arrangements. It did not please everyone. NSR shareholders were alarmed when they learned that to reach agreement, the company had accepted £8,000 in settlement of its claim for £62,000.

But the board's reasons were sound since it contended that even if they had continued the legal battle and won the balance outstanding, it would have been swallowed up in legal fees and the LNWR would have become a powerful enemy. History was to endorse the NSR decision since the agreement which finally gave the NSR its proper share of Manchester Traffic, formed the basis of the ultimate pattern of relationship between the two companies, with each having extensive running powers over the other's lines.

Relations a year or two earlier had been strained when the NSR and the LNWR found themselves on opposing sides in the battle of rates between London and Lancashire. It spread over 1857–8 after the GNR got access to Manchester and undercut LNWR fares.

Agreement was not reached until November 1858 when the MS&L and GNR on the one hand, and the LNWR on the other agreed to a joint committee to divide all London—Lancashire traffic among themselves in agreed proportions. To legalize this 'Triple Alliance' a Bill was deposited, but once its contents were known the Midland Railway objected as one of the main companies left out. Others included the NSR. The House of Lords upheld the view that the Bill would prejudice the development of other routes between London and Lancashire and threw it out saying it was unsatisfactory unless the Midland was included. A Bill

to meet this point was lodged, only to be defeated because of the NSR's opposition.

In March 1858 the NSR decided to petition against a number of schemes which it regarded as hostile: the MS&L Liverpool extension and, nearer home, the Stockport, Disley & Whaley Bridge line and also additional works which the LNWR wanted to carry out on the Cromford & High Peak to thwart a new source of competition to London—Manchester traffic provided by the Midland driving north through Derbyshire.

The LNWR was considering either leasing the C&HP and improving the line between Whaley Bridge and Buxton to bring it up to standard for ordinary trains, or replacing the SD&WB extension to Buxton (authorized the previous July) by a line through Buxton to Rowsley.

A threat to the LNWR's London—Manchester traffic also constituted, of course, a threat to the most important NSR passenger traffic, and at this time, it was sparse enough, due partly to strained relations.

One factor that helped to keep finances sound from the start was a careful control of working expenses, which kept them at a level favourable in comparison with many railways.

One successful period was in the late 1850s, when weekly expenses were reduced from 55 per cent of receipts in 1855, to 49 per cent two years later.

In the financial context, it is worthwhile mentioning taxation at this period. From its 1857 revenue of just over a quarter of a million pounds (£253,571), the company paid £6,540 in rates and £3,590 in passenger duty. Together, these taxes represented nearly 6 per cent of the total share capital.



The Influence of Landowners on Route Selection

BY FRANK A SHARMAN

The proposition

Little detailed consideration seems to have been given to railway and canal route selection¹ and when the matter has been considered the chief concern has been with general economic factors, engineering questions, the location of other transport undertakings and the influence of water supply. One possible factor influencing the selection of routes, which has received only scant attention, is the attitudes of the landowners along the proposed line. One writer who has considered the topic is Dr J. H. Farrington, whose conclusion — and it is fair to say that this was not a major finding in his work — was that “the effect of vested interests was to produce minor alterations in the physiographically and economically optimum route. These alterations might be small deviations, perhaps with heavy cutting or embankment”². It is the accuracy of this proposition which will be considered in this article.

General principles

How can one test such a proposition as Dr Farrington’s? One way of doing it is to start from the premise that, if a route is planned from A to B then there are factors which define the ideal route; eventually there is the route actually used. The ideal and the actual route may vary and, if they do, one can start to analyse which factors influenced that variation.

A canal or railway can have no primary purpose other than the carrying on of trade between two termini³. There is no theoretical reason why the ideal route should not be dead straight and dead level⁴. The factors which cause variations from this in practice appear to be as follows. Firstly, there are technological and geomorphological considerations which indicate the limits of engineering possibility. For example, both a canal and a railway have, in general, a maximum practical gradient of 1:100; on canals, sharp turns are possible, on railways they are not; in the case of canals there is also a water supply factor which dictates the need to find a line with a single summit if that is at all possible⁵. Secondly, there are factors such as the potential competition of existing transport undertakings, the opposition of vested trade interests (such as the town councils who fear a breach of a local trade monopoly) and also the potential benefits of complementary undertakings. Thirdly, there may also be general environmental factors though, except in those cases where railway stations were kept outside cities such as Cambridge, this does not seem to have weighed heavily in canal and railway route design.

Clearly these factors cause variations to be made from the ideal route but it is submitted that, even when they are all taken into account, they by no means leave only one possible line:— a wide variation is still, in most cases and over much of a route, possible. The last remaining factor which can affect the final result is the influence of the landowners.

A proper assessment of the extent of the landowners’ influence would need to take into account several matters. In the first place, could landowners affect the route at all; what devices had they by which they could exert influence to vary the line? That question must be dealt with here only briefly⁶. The important

point is that if any landowners on a proposed line disapproved of the scheme the promoters would either have to go round him or get compulsory purchase powers by Act of Parliament to force the sale of his land. Parliamentary Standing Orders required prior publicity for the Bill; Parliamentary procedure provided an opportunity for aggrieved landowners to be heard. Therefore, there was a possibility of the Bill's being defeated, drastically amended or seriously delayed by the opposition of the landowners — and the promoters had to allow for them.

The practical effect of the exercise of the landowners' influence can be tested in a number of ways. Some evidence is collected under each of the following four headings.

Landowners in favour

If the affected landowners were all supporters of the railway or canal then, arguably, the actual route taken is likely to correspond closely with the economically, technologically and geomorphologically optimum route. But evidence on this is hard to come by — the easy cases leave little mark on the historical record, and even a willing vendor of land might yet seek some deviation in the route. A detailed examination of the routes of, for example, the Pocklington Canal and the Manchester, Bolton & Bury Canal might prove to be revealing⁷ as indeed might an examination of the route of the Thames & Severn Canal where, at the outset, the landowners were in agreement even though land acquisition problems were to arise later⁸.

Causing the line to be abandoned

Another test of the influence of the landed interest in whether or not they could prevent a line being built at all. On this there is little evidence, doubtless because if a scheme were abandoned at its earliest stages on account of the opposition of landowners little or no trace of the scheme will now remain in the records. Similarly if a scheme failed because the Bill for it were rejected by Parliament the effect of the landed opposition cannot always be disentangled from a variety of other possible reasons for rejection: Committees of Parliament had an awkward habit of not recording their own debates but merely giving a 'yes' or 'no' answer. Landowners' objections were only one of the matters to be weighed in the balance, and how the balancing was done can only be deduced from secondary evidence which is hard to come by.

But some evidence may be collected. The first Bill of the London & Birmingham Railway Company was rejected by Parliament, and in this case it is quite clear that it was because of landowners' objections. A year later the Bill was passed. The Berkshire & Hampshire Junction Canal Bill suffered exactly the same fate — although in this case the canal was never built, for other reasons. It also seems that a scheme to extend the Kennet & Avon Canal down to Bristol was prevented by landowners' opposition, but a later Act for the same scheme was passed despite the objection that it would be 'in every respect ruinous to private property'⁹; this canal, too, was never built, for other reasons. The landowners staved off legislation for the improvement of the River Don for many years¹⁰. The Dorset & Somerset Canal Company abandoned the whole of its proposed southern extension to Poole because of landowners' opposition and thereby they lost much of the commercial purpose of the canal which was to link Bristol with the English Channel¹¹. At least two of the counsel for landowners opposing the 1825 Bill for the Liverpool & Manchester Railway emphasized to the House of Commons Committee that the rights of private property should only be interfered

with in the face of clear evidence of public necessity and practical convenience, and the Bill was defeated, at least in part because of the landowners' objections, though mainly on account of inaccuracies in the deposited Plans and Sections. A new Bill was passed the following year when a new route had been devised which was less objectionable to the landowners¹².

This limited evidence may indicate that landowners could not, in the long term, completely defeat a project that was pushed forward by promoters, was not economically hare-brained and was not along a route which directly effected the property of a large number of influential men.

Varying the line

So to what extent did the promoters have to vary their line in order to get their Bill through Parliament? A number of examples may be examined to give some indication of the extent to which deviations were made.

The following comment, made by the engineer John Smeaton, in his report to the promoters of the Trent & Mersey Canal on the route designed by James Brindley, is quoted by Farrington:

‘[the route] is as little injurious to private property as the nature of the work will admit of, Mr Brindley having judiciously designed the course thereof to pass through a great number of level commons and waste grounds and, in general, through the most barren lands that could be found in any wise to agree with the route thereof.’¹³

Of this observation, Dr. Farrington remarks that ‘this reference to such an influence on canal routing appears to be unique.’ However, it is submitted that the considerations which influenced Brindley’s choice of route were such obvious ones as usually to be not worth remarking on; no engineer could afford to pay no attention at all to the expense and opposition his choice of route might generate.

In 1819 in Rees’s *Cyclopaedia*¹⁴ an article on canals, thought to have been written by Thomas Telford, describes how the line is surveyed initially. Once a level has been found it is followed ‘till some obstacle as a gentleman’s park, houses, gardens, orchards, mills, roads, etc. present themselves at a distance’: the engineer then sets about finding a way round the obstacle. This clearly reflects two points: firstly the likelihood of the country gentleman’s being an effective opponent of the Bill and, secondly, the tenderness Parliament showed for houses, parks and gardens.

In 1831 George and Robert Stephenson advised the London & Birmingham Railway Company of three principles to be observed in planning a route: the need for the lowest relief, the need to avoid expense and the need to avoid parks and pleasure grounds in every practicable case.

In 1831, when the dispute between the landowners and the railway company was at its height, an advertisement inserted in a local newspaper on behalf of the railway company announced that ‘The utmost endeavours will be made to avoid all molestation to noblemen and gentlemen’s seats near which the proposed line is intended to pass. The railway company has given directions to the surveyors to spare no expense for this purpose. It is always ready and happy to communicate with all parties who wish an alteration in the direction of the railway.’¹⁵ In the end the company had deviations in its line to avoid the parks of both Lord Essex and Lord Clarendon, which deviation necessitated the building of a tunnel 1 mile 57 yards long; further deviations were made to avoid the parks of a Mr Thornton

at Brockhall, a Mr Lidington of Elmdon, the Countess of Bridgwater, and probably others too¹⁶. The Earls of Essex and Clarendon had earlier caused similar trouble to the Grand Junction Canal Company. In March 1795 the company paid £5,000 to the Earl of Clarendon for permission to pass through his park, Grove Park, and that sum did not include the price of the land. They also paid the sum of £15,000 to the Earl of Essex to pass through Cassiobury Park and most of that amount was a *douceur*¹⁷. The Act¹⁸ authorizing this deviation from the previously authorized line was duly passed in the same month as the payment was made.

Other specific instances of deviations can be given. Of the course of the summit level of the Grand Junction Canal at Braunston, Farrington says¹⁹:— 'At the eastern end it seems that the limiting factor was the large estate of Norton Park. Although reference to such a specific influence has not been found, it may reasonably be assumed that the level might have been continued further south if Norton Park had not necessitated its descent to a level lower down the valley, which enabled it to skirt the park.' The Basingstoke Canal Company went to considerable expense in changing their line to avoid Tylney Hall, taking it through the very long Greywell Tunnel in order to do so²⁰. The Oxford Canal contains a remarkable length which comes almost full circle upon itself round Wormleighton Hill; the shorter, direct route would have involved a cutting but, as the engineer Samuel Simcock pointed out, it would also be 'much more injurious to the estate of Earl Spence': further, the longer route would need no lock on it so that 'the navigators will have no business to stop . . . so that the apprehended danger from the inroads of bargemen will be the less.'²¹

In 1793 Robert Whitworth, the engineer of the Dorset & Somerset Canal, recommended one of a number of possible routes as the best 'provided the consents of gentlemen, near whose seats the same must necessarily pass, can be obtained', and the line eventually decided upon was amended in various places to allow for opposition²². When the Hampshire & Berkshire Junction Canal Company had lost their first Bill, because there was insufficient time for the Commons Committee to hear all the landowners' objections, the company started to prepare their new submissions by considering alterations in the line to reduce the number of objectors²³. In 1826 the Liverpool & Manchester Railway having lost one Bill the previous year, had a new route surveyed by Charles Vignoles who 'by so skilfully routing his line, was successful in cutting the heat out of much of the opposition's case against the railway. The majority of landed proprietors were appeased . . .'²⁴. But this new line, 'because of the route adopted in order to avoid irritation of the landed and waterways interests, . . . had certain decided disadvantages'²⁵. The Bill, however, was duly passed²⁶. In 1857 the Oswestry & Newtown Railway instructed their engineer, in making the survey, 'to take the line south of the Severn between Welshpool and Newtown so as to avoid opposition from a certain Mrs Owen who seems to have been a force to be reckoned with in Mid-Wales railways promotion.'²⁷ Even when the enabling Act was passed, and the line defined to a greater or lesser extent, variations were still possible. The Warwick & Napton Canal varied their line, not by passing an amending Act, but simply by entering into a deed with the landowner concerned²⁸.

These examples at least throw some doubt on Dr Farrington's conclusion, but the cases referred to so far mainly concern the choice of line in rural areas. In urban areas there seems to be little doubt that the large landowners did affect the route but in the opposite way. The question has been considered in great detail by John Kellett, who says in his book that:

'it is one of the recurring themes of this book that the underlying pattern formed by units of land ownership is one of the critical factors in explaining the routes cut through Victorian cities by the railway builders, and the choice of site for the termini and yards'.²⁹

This conclusion is backed by much detailed evidence which cannot, and need not, be repeated here. Two quotations will suffice. On the siting of stations Mr Kellett says: 'The main consideration in their cities was to achieve the cheapest and simplest approach and terminus, with the minimum of disturbance to property . . .'.³⁰ The way this was achieved was as follows:—

'For the railways in particular, the prospect of dealing with a few owners offered a simplicity and speed which alone made it possible to carry through large schemes within reasonable margins of time and cost. It was well worth while paying through the nose to conclude such a series of deals privately, and to disarm the opposition. . . . Reaching a settlement with the larger urban landowners had the further advantage of avoiding the endless reduplication of legal and survey charges connected with small cases, the endless delays which arbitration procedure presented and the high awards sympathetic juries tended to give.'³¹

In other words, in the urban areas the railway companies sought out the large estates for their routes, whereas it appears, in the rural areas they tried to avoid them.

Other benefits accruing to the landowner

There were also numerous minor effects of the need to make an accommodation with the landowners. The general point is expressed by the engineer Robert Whitworth when reporting to the Thames & Severn Canal Company on the merits of two lines they were considering. Of the one he says³² that it can be made 'with very little detriment if any at all to owners or occupiers of the mills or to any other persons whatever' but 'as it goes through a populous vale, and very near several gentlemen's houses, and through some of their orchards and gardens, it will require more than a common neatness in the execution to make it agreeable — and consequently the expense will be more.'

The form of increased expense Mr Whitworth was referring to here was landscaping the canal. This would either be in the form of putting the towpath on the opposite side of the canal from the uphill side preferred by the engineers³³ to lessen the risk of intrusion (as for instance happened on the Kennet & Avon Canal in a number of places), or of ornamental bridges instead of the usual plain ones. This occurs in many places on many canals, some of them, for instance, occurring on the Grand Junction Canal as a result of the agreements with the Earls of Essex and Clarendon for taking the canal through their parks, one of the conditions of which was that the canal be made as ornamental as possible. But expenditure on this form of landscaping could be heavy, especially when it went so far as to involve — as appears to have been more frequently the case with railways than with canals — hiding the line in a cutting or tunnel.

Finally the landowner could often get the benefit of making the promoters buy him off — either by direct bribery, or by the insertion of clauses in the Bill giving privileges to the landowners, or by bribery disguised as greatly increased compensation for land acquired.

Conclusion

It is only possible to draw an interim conclusion from all this but it seems clear enough that the final line of a canal or railway might be quite considerably affected by the landowners along the optimum route. In the final analysis all the constraints which operated on the engineer when he was fixing the line became economic ones. There were very few physical limits on where a canal or railway might go: the real question was whether the costs of the works would make the undertaking unprofitable. The same is true of the landowners' opposition: the real question was whether the deviation was economically worthwhile bearing in mind the increased cost of construction and maintenance and whether the longer route would result in a significantly less efficient transport undertaking. Usually most landowners had their price and the economic question was whether it was worth paying it to get the line through.

Whether or not one agrees with Dr Farrington's conclusion that 'the effect of vested interests was to produce minor alterations' depends very much on what one thinks is 'minor'. One way or another the effects of allowing for landed opposition could lead to the success or failure of the undertaking and in that sense no deviation would be 'minor' to the company concerned: everything contributed to the viability of the scheme. For the engineer the landed opposition was just as important as the other constraints upon him and he had to achieve a balance between them and attempt to minimize the effect of each. The effects of vested interests on the route were, in fact, no greater and no less than the market would allow, and no greater and no less than other economic factors. In physiological terms, it is submitted this article has at least thrown doubt on whether the effect of landed opposition was no more than 'small deviations' – the effect pervaded the whole route design from the start of planning the route to the finish and from one end of the route to the other. It may be possible to devise a precise quantification of each of the elements influencing route selection but that lies in the remoter realms of historiography.

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The Terminal Tunnels of Central Manchester

BY PETER K. ROBERTS

A terminal canal tunnel is one at the far end of which there is a shaft or shafts through which cargo can be hoisted to a higher level surface. The difference between this and a through-navigation tunnel such as Hugh's Bridge on the Donnington Wood Canal is that the cargo is not transferred to boats on a higher level canal, but is deposited at a wharf or warehouse for road or rail distribution. The significant point is that on leaving the boat at the bottom of the shaft the cargo has effectively completed its canal journey.

This type of tunnel evolved largely as the result of innovation at the Castlefield terminus of the Bridgewater Canal in 1765, and was copied at several other sites where the local topographic conditions favoured its adoption. Terminal tunnels are seen largely as a device to enable bulk cargoes, such as coal, to be lifted to higher levels with the greatest efficiency possible, but are limited to locations where steep or vertical slopes occur, thereby reducing the length of tunnel required. There are just three examples; these being Castlefield tunnel (28yds.), Bank Top Level (649yds.) and the Manchester & Salford Junction Canal tunnel (499yds.), all located within the same 200 square yards on the periphery of Central Manchester.¹

Located on an interfluvium of higher ground (rising to 150ft. in Piccadilly) between the Irwell and Medlock valleys, Central Manchester is peculiarly suited to the adoption of terminal tunnel facilities. To the east, near Piccadilly Station, this interfluvium is sub-divided by the valley of the now culverted Shooters Brook (forming, in part, the Bank Top Level); a right bank tributary of the river Medlock. Along the eastern bank of the Irwell and the Lower Medlock, in the vicinity of Castlefield, the edge of the higher ground is bound by a Triassic sandstone cliff. This rises as much as 50ft. above water level, and in many places is immediately adjacent to the river. Summarizing, the basic water transport problem in this area is that of raising cargoes from wharves on the river Irwell and Bridgewater Canal to their final destinations above the 50ft. contour in central Manchester.

a) Castlefield Tunnel

During the early eighteenth century the oldest wharf on the River Irwell was at a point where there was a break in the sandstone cliffs, just downstream of the present Blackfriars Bridge, on the north-west perimeter of central Manchester. Others followed, until by about 1760 there was a string of wharves downstream of this original site. The first Manchester terminus of the Bridgewater Canal, approaching from the south-west, at Castlefield, and in use by August 1765 'was a simple open wharf at the point where the artificial canal swallowed up the altered Medlock and where the old Chester road [from Stretford] dipped into the Medlock valley to cross the river by Knott Mill Bridge before continuing as Alport Lane, Alport Street and Deans Gate to the centre of Manchester.'²

The central problem here, as at the river wharves, was that of lifting cargoes from the low lying canal to the Deansgate level from where it could be distributed. The solution adopted at wharves along the Irwell was to build long flights of steps or to cart the cargoes. At one site, as early as 1728, a warehouse was built with one gable end overlooking the river and the opposite end abutting

onto the road. Cargoes could then be easily hoisted to the higher level, and this system remained in universal operation at sites along the Irwell valley throughout the nineteenth century.

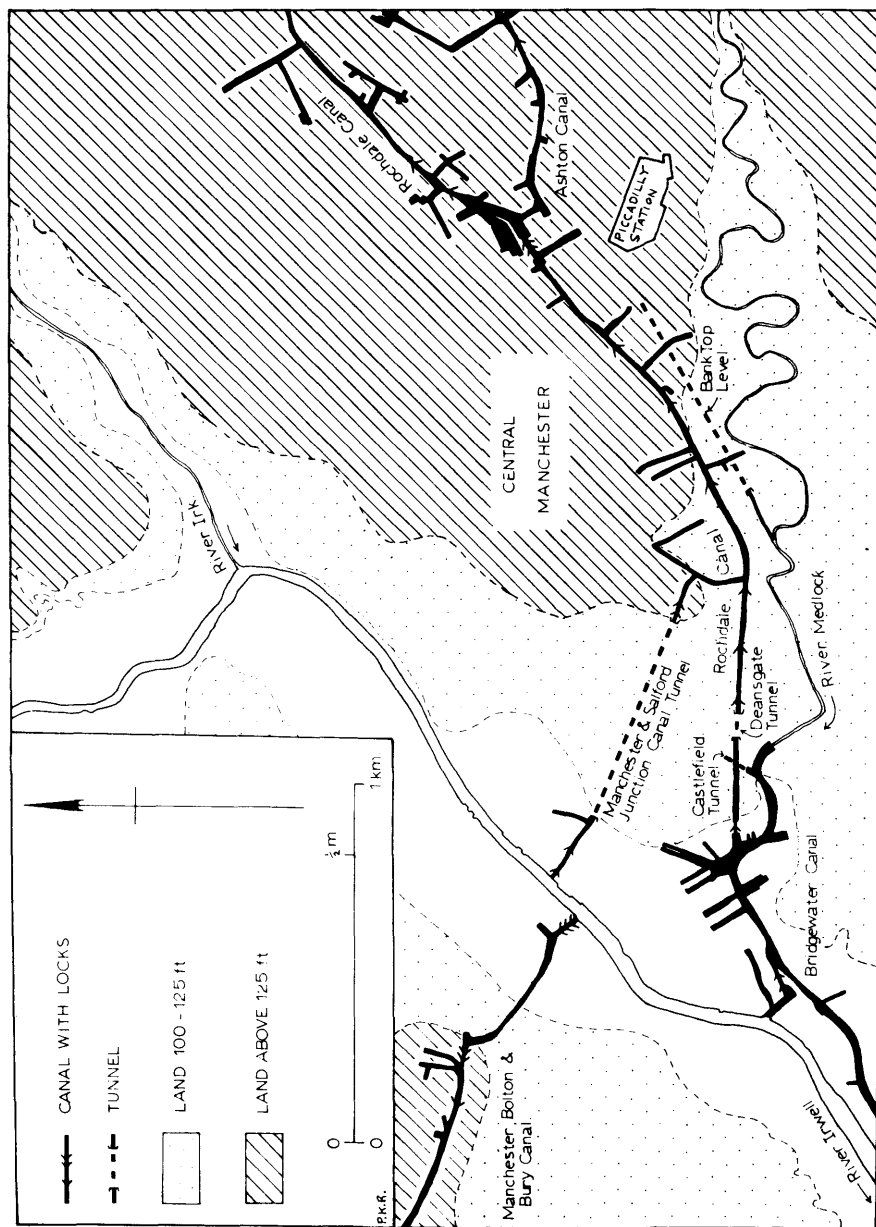
At Castlefield, however, the chief engineer of the Bridgewater Canal, James Brindley, solved the problem with an ingenious application of tunnelling and water power ideas. His confidence was no doubt reinforced by his early success at Wet Earth Colliery and the growing application of similar principles at the Worsley collieries.

Work on the Castlefield terminus had begun in 1763, with the excavation of a series of subterranean passages linking various river overflows on the Medlock with an outlet to the Irwell, thereby controlling the flow of water, even in times of flood, and effectively canalizing the Lower Medlock. This work was completed sometime in 1764 and was only possible because the river bed is of solid sandstone in this area. At this time the Bridgewater Canal was only open between the Worsley collieries and Castlefield, with a short branch to Longford on the (yet to be built) Runcorn line, so that the principal traffic was coal for Manchester. This was transported in the special mine boats or starvationers, each up to 47ft. long, 4ft. 6ins. wide, and holding a dozen 8 cwt. metal boxes of coal. Thus, the initial requirement at Castlefield was simply to raise the coal about 25ft. to the Deansgate level for immediate distribution, so that no warehousing capacity was required.³

The solution envisaged by Brindley was to take the boats underground again. A tunnel penetrating 28yds. into the sandstone cliffs of the Castlefield terminus was operational by late 1765, and was approximately 16ft. wide at water level, and up to 11ft. high. The vertical sandstone walls were left unlined, whilst the roof was arched with a single protective ring of red brick, which was also used to secure the end wall of the tunnel. Less than 15yds. inside the tunnel a vertical shaft was sunk to canal level and a pivot crane built to raise the coal boxes to the Deansgate level for street distribution. Using a clever system of underground channels, which connected to the Medlock drainage system, the power of the river water was harnessed to drive a breast water wheel, which was located in a rectangular underground chamber cut out of solid rock. The wheel, in turn, operated a wooden drum carrying cables connected to the crane in the vertical shaft.⁴ Young informs us that two men and a boy were employed during the unloading of boats, and that the cargo of nearly five tons could be discharged in twenty to forty-five minutes, according to the height of the water in the channel. When the water was high the working of the water wheel was impeded.⁵ It is interesting to note that the section of tunnel beyond the shaft remained unused, for it was initially hoped to erect a second waterwheel and shaft as traffic loads demanded.

However, from the time of its opening, the Castlefield terminus was also visited by 50 tons capacity river barges, and work was continuously taking place to cut away the sandstone cliff, thus providing additional wharfage space at water level, as well as gradually reducing the length of the tunnel. With the opening of the Runcorn branch of the Bridgewater Canal in 1773 (goods being carted past the gap at Norton Priory until 1776), and a gradual increase in the volume and variety of general cargoes, it became imperative to provide warehousing facilities. Two warehouses were built at Castlefield, one at the head of navigation on the Medlock, the other one at the entrance to the Castlefield tunnel.

This second warehouse, operated by the canal carriers Henshall & Gilbert, and known as the Grocer's warehouse, was built between 1770–80. It was 63ft. long, 31ft. 6ins. deep and had 2ft. 6ins. thick walls at canal level. It had five storeys



and its construction required the clearance of a flat area of land some 70ft. by 39ft. Construction of the warehouse halved the length of the Castlefield tunnel and involved the destruction of the original shaft and water wheel. A single warehouse shipping hole, to run contiguous with the tunnel line, entered the front of the warehouse some 24ft. from the west gable wall and 30ft. at the rear. To the west of the shipping hole, and making use of the modified Brindley wheel chamber which was extended and divided into two, a second (undershot) waterwheel was erected. This was located at 90° to the first and was 10ft. 6ins. in diameter and operated cables which drove the warehouse hoist.⁶

To accommodate the displaced waterwheel a further chamber was excavated in the solid rock adjacent to the west side of the tunnel interior, and a shaft cut to the surface to provide a system similar to the original one. The tailrace for this waterwheel, a passage about 24ft. long and 3ft. wide was harnessed to drive the other waterwheel. In 1793 the warehouse was doubled in size and a second shipping hole added to the east. The tunnel and shaft arrangement became obsolete in 1800, with the completion of the Rochdale Canal which provided a direct water link to the lucrative Manchester market. Summarizing, the early history of these pioneer canal works 'showed strict functional design based on the configuration of the land, the nature of the cargoes, the method of storage and, to some extent, the type of vessel employed.'⁷

There is little to be seen of the Castlefield tunnel today. The Grocer's warehouse was demolished in 1960 and its cleared site is now used by a security firm as a car park. Although visits to the site are not encouraged, a fine panorama may be obtained from a nearby road bridge over the river Medlock. The site of the second shaft is located on the towpath of the Rochdale Canal just west of the present Deansgate tunnel. It is capped with concrete and a small metal grill. Immediately opposite this, a short branch of the Rochdale Canal terminates in a low red brick arch, backed by the magnificent railway viaduct approaching the former Central Station. The canal branch and arch is, in fact, the remains of the far end of the Castlefield tunnel, which was broken into during construction of the Rochdale. In the short remaining accessible portion of the tunnel, the abrasions of the original miners picks can be clearly seen.⁸

b) Bank Top Level

A second tunnel which operated on very similar principles to that at Castlefield, and obviously modelled on it, was the Bank Top Level, 649yds. long and completed in April 1789. Again, its purpose was to convey starvationers, laden with boxes of coal, from the Medlock to a point where it could be conveniently hoisted for distribution.

The tunnel was incorporated into the plans of a scheme to culvert the Shooter's Brook in its course through central Manchester. Instead of being gently graded, the lower portion of the culverted brook was maintained at a level, or almost so, thus creating the Bank Top Level. This involved a certain amount of true tunnelling and created a considerable difference in elevation from that of the upper culverted portion. The necessarily steep descent from the upper portion generated a powerful current which was utilized to turn a waterwheel located in an underground chamber, as at Castlefield. This wheel powered a crane at the head of a vertical shaft which was at the terminus of the canal level, at (Shooters) Bank Top, located between the present Piccadilly Station and the Pump Street arm of the Rochdale Canal.

In 1800 the arrangement was superseded by the completion of the Rochdale Canal through the heart of Manchester, but for eleven years the system had

operated successfully.⁹ Indeed, in January 1794 more land had been purchased to provide space for further coal storage and a corresponding expansion of the operation.¹⁰ Many years after it ceased to be navigable, the tunnel continued to discharge a valuable overflow function for the Rochdale Canal, as stipulated in an agreement with the Bridgewater Company.¹¹

c) Manchester & Salford Junction Canal Tunnel

The third terminal tunnel which came into operation, and a little different from the others, was that of the Manchester & Salford Junction Canal. This was originally completed in October 1839 as a direct link between the River Irwell and Rochdale Canal. In 1875, after a series of discussions and abortive attempts to utilize part of the canal bed, the Cheshire Lines Committee, by an agreement with the Bridgewater Company was allowed to infill the upper portion of the canal between Mossley Street and Watson Street, thus rendering the remaining portion totally useless. The purpose of this was to provide a site for the Central Station of that consortium.

However, the canal regained a useful function when the Great Northern Railway built its goods station immediately adjacent to Central Station in 1899. Two vertical shafts were sunk 25 feet down to the remaining portion of the canal so that traffic might be interchanged between the railway and Ship Canal Docks at nearby Salford, via the Irwell. This arrangement continued satisfactorily until about 1922. Thereafter the practice ceased and in 1936 the tunnel was finally abandoned.¹²

In summary, it can be seen that all three tunnels have a number of points in common. This is especially true of their physical locations, at the base of steep banks on the perimeter of central Manchester, their mode of operation using vertical shafts and cranes, and (in the case of Bank Top Level and Castlefield tunnel) the type of boats and traffic handled. All the tunnels had a relatively short working life, being seen as transitional features in the pattern of communications, and replaced by more efficient and greater capacity systems of interchange as the need arose. At Bank Top Level and Castlefield tunnel propulsion was probably by shafting or hauling on pegs or ropes, possibly (at Bank Top Level), assisted by hydraulic means. A path suitable for bow hauling was provided at the Manchester & Salford Junction Canal tunnel. It is interesting to note a similar system was suggested for Dudley tunnel (2904yds.) where an underground wharf and layby, with a vertical shaft into the centre of Dudley was planned.¹³ At Bath (South) tunnel the Kennet & Avon Canal passes directly beneath Cleveland House, the headquarters of the company. A trapdoor in the tunnel roof communicated with the cellars, thus enabling parcels and mail to be passed through.¹⁴

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1. It is likely that the works at Hugh's Bridge and Brierley Hill tunnels were copied from the original Castlefield example. See Charles Hadfield: *The Canals of the West Midlands*. David & Charles, 2nd. ed. 1969, pp. 41, 157.
2. V. I. Tomlinson: 'Early Warehouses on Manchester Waterways'. *Trans. Lancashire & Cheshire Antiquarian Society*, Vol. 71, 1961, pp. 129-51 (see p. 133). Note: Knott Mill Bridge is located at GR834974. Alport Lane and Alport Street ran between this bridge and Lower Deansgate, but have been obliterated by extensive transport improvements in the area.
3. Ibid. This section based entirely on pp. 129-40. See also Abraham Rees: *The Cyclopaedia or Universal Dictionary of Arts, Sciences and Literature*.

Longmans, 1819, 39 volumes; Note: the edition used here has un-numbered pages and therefore no page references can be given; Volume 6, Article 'Canal'.

4. C. T. G. Boucher: *James Brindley Engineer 1716-1772*. Goose, 1968. pp. 51-52.
5. Arthur Young: *Six Months' Tour through the North of England* (1770) quoted in H. Clegg: 'The Third Duke of Bridgewater's Canal Works in Manchester'. *Trans. Lancashire & Cheshire Antiquarian Society*, Vol. 65, 1955, pp. 91-103 (see p. 98).
6. Based on V. I. Tomlinson, op. cit., 1961, pp. 135-41. Note: various authorities, including C. T. G. Boucher, op. cit., 1968 and A. Young, op. cit., 1770 differ on points of detail here.
7. Ibid, p. 130.
8. Based on field examination.
9. Mostly based on Charles Hadfield and Gordon Biddle: *The Canals of North West England*. David & Charles, 1970, p. 33, with supplementary map and fieldwork.
10. H. Clegg, op. cit., 1955, p. 99.
11. C. Hadfield and G. Biddle, op. cit., 1970, p. 270.
12. Ibid. pp. 365-66.
13. D. A. Gittings (ed.): *Dudley Canal Tunnel*. Dudley Canal Trust, 1973, p. 20.
14. K. R. Clew: *The Kennet & Avon Canal*. David & Charles, 1968, p. 188.

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Sir Edward Watkin and the Penistone Disaster

BY DONALD R. STEGGLES

On 16 July 1884 a Manchester to London express of the Manchester, Sheffield & Lincolnshire Railway consisting of engine, tender, horsebox, eight carriages and two brake vans on a heavy falling gradient near Penistone was derailed opposite the Bullhouse Colliery. The engine, tender and horsebox stayed on the line, the remainder going over a bridge into the road below. 24 passengers were killed and 62 seriously injured. The cause of the accident was a fracture of the engine's crank axle.

The purpose of this article is not to re-examine the accident but relate it to Sir Edward Watkin.

Sir Edward Watkin was a man of many parts, railway financier, orator and legislator. He entered railway management as an executive via the Trent Valley and London & North Western Railways ultimately becoming Chairman of the MS&LR, South Eastern and Metropolitan Railways. As an administrator he aimed to reduce fuel consumption, monitored traffic costs and encouraged locomotive exchanges. In Parliament he represented the railway interest but no one knew what his politics were.

Sir Edward became a founder member of the Railway Companies Association formed in October 1858 and was on the committee which defined the objects of the Association. That this Association was, in effect, seeking a railway monopoly is shown by the principal aims which were 'the unsatisfactory position of all railway property' and to 'eliminate extravagant and wasteful competition', but due to internal wrangling the Association was wound up in 1861. During its short life it had the dubious distinction of persistently delaying legislation for accident prevention on the railways.

One of the biggest obstacles to the joint working of the South Eastern Railway and the London, Chatham & Dover Railway was the reluctance of Sir Edward, and the Chairman of the Chatham Company, Mr J. S. Forbes to sacrifice personal ambitions, especially as Forbes had been Sir Edward's protégé; indeed it was only after his retirement in 1894 that the two companies worked closely together. The *Economist* described Watkin as 'an autocrat whose strong will was backed up in many respects by much practical capacity; he carried all before him in the Board Room'.

Watkin's claim was that 'the whole object of management of a railway is dividend'. He was condemned by many for his empire building and in modern terminology would be classified as an asset stripper.

On the MS&LR the Smith vacuum brake was used, the companies having it made great claims, and Sir Edward boasted of its simplicity and beauty. Smith's was not instantaneous in action and not self-acting, in the case of an accident; unless provided with exhausting pumps in the brake vans they could only be put on by the driver, the guard having no control unless provided with the fitted brake van. At Penistone the driver put the brake on immediately but as the couplings had already broken, or the pipe was damaged, the train ran on.

After the accident came the enquiry and the Board of Trade report from Major Marindin commented 'although the Board of Trade has, as yet, no power to insist upon the adoption of a continuous brake possessing these qualities, yet I would remind the Manchester, Sheffield and Lincolnshire Railway Company that this is the second emphatic warning which has been given to them within the last six months as to the need for automatic action in the brakes used upon their line . . .'

The result of this criticism was an abusive attack by Sir Edward and his Board, on the Board of Trade, the inspecting officers, the Westinghouse brake and the proposed legislation on braking. Major Marindin was accused of bias in favour of Westinghouse and further of creating prejudice against the MS&LR. The attack concluded '... reports of the officers of the Board of Trade would seem to justify a suspicion that they are written under instructions with a view to form a groundwork of legislation inimical to railway property and to the interests of railway shareholders. . .'. However the letter did not argue against, or produce evidence to controvert, the opinion of Major Marindin.

An editorial in *Engineering* made the pointed remark: 'The public . . . will disregard the wounded feelings of the Manchester and Sheffield directors, who, had they been wise, would have taken the reproof in silence and have resolved to amend their ways for the future'.

It was suprising that so public a figure as Sir Edward should treat a Board of Trade report and its views in such a contemptible way when plainly the company was at fault. At the following half year meeting of the shareholders of the Manchester & Sheffield, as Chairman Sir Edward opened proceedings by declaring the company was under no pecuniary liability for those killed, or injured, but altruistically and modestly announced that he 'had himself instructed the Secretary, for himself, and not for the shareholders to offer some relief in different directions in urgent and sad cases of poverty and difficulty'. There then appears to be a family difference in that Sir Edward's son, Alfred, proposed that the speed of trains be reduced to a uniform 40 miles per hour. Sir Edward hastily pointed out to the shareholders that the Penistone accident was not due to excessive speed.

From Manchester Sir Edward then went to a shareholders meeting of the South Eastern Railway, where the inevitable question was raised — was the brake in use on that line the same as the MS&LR, to which the Chairman gave the evasive answer that 'the brake used on the South Eastern [it was Smith's] was the vacuum brake which was the very best brake out. The brake spoken of in competition with it [Westinghouse] was, in his opinion, one of the most complicated and dangerous brakes that could be put into operation . . . in the accident which had been alluded to, the brake did its duty'. Not unnaturally the Westinghouse Brake Company made a strong rebuttal.

Sir Edward was used to having things on his terms, and used to taking abuse but it has to be said that the Penistone disaster did him no credit whatsoever. Even allowing for his dislike of the Board of Trade and its reports he must have known, from the trials carried out with various vacuum brakes on the Midland line between Newark and Nottingham in June 1875, that the Smith brake did not come out at all well. Was it the cost of converting to Westinghouse, or was Sir Edward so egotistical he could not be proved wrong?

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John Airey in South Wales

BY DAVID GARNETT

For a quarter of a century I have been aware that there was something odd about the early editions of John Airey's RAILWAY DIAGRAM OF SOUTH WALES. For most of that time I have had a note to make a pilgrimage to see Mr. Clinker's copy, about which he had given me some details in a letter, with his usual kindly encouragement for the seeker after truth in railway matters.

In my article about Airey's early railway maps in the March 1979 *Journal*, written some months earlier, I admitted still being very uncertain about the development sequence of the South Wales maps and even allowed some doubts as to Airey's commercial integrity to show. Mr. Clinker exhibited his map at Brunel University in March 1979. I saw it there and immediately recognized that it was not the same as any of the other eight first edition copies known to me. Mr. Clinker kindly agreed to me having this map photographed for study in greater detail, but on returning home I realized that this might not reveal everything, e.g. expert manuscript additions in indian ink do not always show up for what they are on a photo copy. By courtesy of Brunel University I was able

to see the map again before it was returned to its home in Cornwall. In no time despair overtook me. Here was another piece which did not seem to fit into the jig-saw puzzle. I wept silently and then idly fell to comparing Mr. Clinker's copy with an original of my own. Almost at once it became clear that the *lithographs* of these two maps were identical and from the same printing, although some manuscript additions differed considerably both as to what was included, the precise location thereof and the manuscript style. By minutely comparing these two originals it was possible to identify and draw up a list of the manuscript 'fiddles', all but one of which adjoined the Monmouthshire Railway. It was also possible to be certain, for the first time, that these two maps were later than the Copyright copies, albeit not much later if a manuscript owner's name and acquisition date on Mr. Clinker's copy was not to be discredited.

Armed, for the first time, with a reliable list of the manuscript additions it became possible to review the whole position from my photo copies without the need for a journey to Aberystwyth to see the two early copies held by the National Library of Wales, or even to rush back to Kew to see the two originals held there. The Public Record Office excelled itself by supplying an altogether better photograph of MPS4 153, the one referred to in my previous article as being in very poor condition and possibly earlier than the Copyright copies.

The position now is as follows: according to an entry in the Stationers' Hall Register on 13 October 1870, RAILWAY DIAGRAM OF SOUTH WALES by John Airey was first published on 5 October 1870. The British Library Copyright cop., 6098 (12), was received on 18 October 1870. I have seen, or have good photo copies of, three other Copyright copies, viz. Bodleian Library C17: 10 (40); Cambridge University Library Maps 36.87.16; and National Library of Scotland Map.1.25.43. These four copies of the FIRST 'A' EDITION are identical and all have the same minute defects showing them to be of the same printing. I am far from clear how the defects mentioned came about on a stone lithograph. In letterpress printing the effect of only part of a character printing clearly would be caused by 'battered type'. For the record, the defects are as follows: — 1. In the second 'H' in H.H.&B. in the Running Powers and Working Arrangements table; 2. The 'ff' in traffic in the ninth line of TAFF VALE in the same table; 3. At Swansea, the second 'O' in G.W. NEW GOODS STA.

The next printing, represented by MPS4 153 at Kew and by one held by the National Library of Wales, now designated (FIRST 'B1') EDITION, must have followed very soon after the FIRST 'A'. The printing defects mentioned above have been rectified but there is now a new one which appears on both the FIRST 'B' variants. This is the 'W' of G.W. in line 18 of the EXPLANATION, following SHREWSBURY & HEREFORD. The justification for the change in edition letter is the addition, *on the lithograph*, of a number of names on the GWR colliery branch near ABERDARE, e.g. 'MERTHYR DARE COL.'.

There is, however, a vital difference between these two (FIRST 'B1') copies. Perhaps this seems a contradiction in terms but it is what foxed me until recently. MPS4 153 is a virgin (FIRST 'B1') printing with none of the manuscript additions which appear on other (FIRST 'B') copies. Now that it is established beyond any doubt that these are manuscript additions and not part and parcel of the map as lithographed, there is no justification for taking note of them when allocating edition numbers, even by a second suffix as I have done hitherto.

Having said that, I must now justify designating the above 'B1'. Three other (FIRST 'B') copies, with the additions near ABERDARE and the defective 'W',

have also another change on the lithograph; a very small change but enough to indicate a separate printing. These are now designated (FIRST 'B2').

The three copies concerned, and the only ones known to me, are: MPS4 152 at Kew; Mr. Clinker's copy with the manuscript signature and date '8 April 1871'; and my own copy.

On all FIRST 'A' and (FIRST 'B1') copies the mileage on the Rhymney Railway between CEMETERY and CARDIFF PASS. STA. is clearly shown as 1m 16c. On all the (FIRST 'B2') copies a nought has been superimposed on the 6 on the *lithograph stone* so that the mileage now reads 1m 10c but the 6 has not been erased and shows through!

For the (SECOND) EDITION, justified by additional lines now shown open, together with subsequent editions, the abovementioned mileage is shown unequivocally as 1m 15c.

There are 'A' and 'B' versions of both the (SECOND) and (THIRD) editions, as shown in the March 1979 article. If my date assessment of the (SECOND 'A') EDITION of early 1872 is right, (and I believe it is but cannot yet narrow down the implied range), then Airey has 'jumped the gun' by showing the L&NWR open between RHYMNEY BRIDGE and DOWLAIS. MacDermot & Clinker give the opening date for this section as 1 January 1873 but Airey was not interested in formal openings or even primarily in passenger train services. If the line was actually under construction, that seemed good enough, and as long as his maps were undated, little harm would be done and there might even be some advantage, especially if someone could give him mileage figures to include on his maps. The Rhymney Railway's Cardiff line, mentioned above, was shown open on the FIRST 'A' EDITION though not opened until 1 April 1871.

I apologize to Airey for even doubting his integrity. After all, he was a cartographer by opportunity and necessity, not by apprenticeship, and anyway was entitled to show what he thought would be useful. (The Ordnance Survey shows boundaries and contours which are not there!) After he began to date his maps, in 1876, he does seem to have avoided showing routes before they were in use. Perhaps he also realized that new editions would be needed more frequently than he had expected. There were 23 editions of the South Wales map in the 25 years of Airey's ownership.

Oddly enough, the pendulum swung the other way on at least one occasion. For the (SECOND) No. 2 EDITION OF SOUTH WALES, published at the end of 1875, Airey added a number of industrial tramways. Those in the Port Talbot area, for example, were based on the first edition of the O.S. 1" map of the area, published on 1 May 1830, but disregarded additions or abandonments made in 1838/41. However, he did include one inexplicable addition to the routes shown by the Ordnance Survey. This was an extension of the Oakwood Railway which ran between the docks and Oakwood, just short of Pontrhydyfen. Airey showed this line continuing northwards to, but not beyond, a 'LEVEL CROSSING' with the South Wales Mineral Railway. Later, he showed this route cut back to make room for a dotted representation of the Rhondda & Swansea Bay Railway but the isolated 'LEVEL CROSSING' continued to be shown for twenty years and has never been explained. It is not shown on the O.S. Large Scale Plans surveyed in 1876.

Nor was the Railway Clearing House blameless in this respect. The South Wales map was completely redrawn to a larger scale for the 1910 edition but this, and all subsequent editions, showed a tramway branching off the R&SBR at Pontrhydyfen, up the Pelena valley towards Efail Fach. There seems little

doubt that there was an ill-recorded tramway towards Efail Fach at some time in history, but it was gone long before the 1910 map was drawn.

Clearly the dates previously assessed for the (FIRST 'B') editions are much too late and there could have been quite a gap between them and the (SECOND 'A') EDITION, during which surplus copies of the earlier editions were 'fiddled' by anyone in the office not more usefully employed; certainly not, in most cases, by competent cartographic draughtsmen.

Members may care to turn up the tabulation in the March 1979 Journal and either correct the information given there for the (FIRST 'B') editions, or strike it out and make reference to this article.

* * *

Correspondence

Towing Path Hedges

Sir, — An aspect of canal construction which gets few references in literature is the making of those hundreds of miles of stock-proof hedge which the canal companies were required to provide. I have, however, read that nurserymen at the time of widespread canal-building were surprised by an increased demand for quicks.

That there was more to hedge-making than one might suppose is made clear by Abraham Rees in his *Cyclopaedia of Arts, Sciences and Literature* (1819) who is led to justify his treatment of the topic as follows:—

'Some may perhaps consider us as going too far into the subject of fencing, but we request of such to consider how important the subject is to a canal-company, which may have to raise much more than a hundred miles in length of quick-fences', and undertake 'the very heavy burden of weeding their quicks two, three or four times annually'.

He refers to a new method of hedge-making used in Norfolk. A ditch is dug and the soil used to make a bank in which staggered rows of quicks are planted. Then the sides of the banks are puddled to inhibit weed growth.

In general the quicks should be planted on a bank with a small ditch to prevent the towing horses from biting or trampling the quick; the main ditch should, however, be on the field side to make cattle keep their distance.

Presumably the canal company was responsible for maintaining the hedge on both sides *and* the ditch beyond.

Rees recommends that the hedge should be carefully cut and plashed (i.e. layered) about every twelfth year. (As a frequent volunteer trimmer of footpath hedges, I cannot but doubt the accessibility of a towing path whose hedge had not been cut for eleven years). PHILIP DANIELL

Melingriffith Waterwheel

Sir, — I was very interested to see Mr C. P. Weaver's account of the Melingriffith waterwheel pumping plant in the November 1979 issue, which I saw on the occasion of a Society visit to the area in 1964. This general view shows two of the remaining wooden paddles and the top of one of the pump cylinders is just visible on the right. A close-up of the return crank arrangement shows that the two cranks are not set at 180° , but something like 90° , so that the pump cylinders would not be balanced but lift at unequal intervals. Can anyone say if there was a reason for this? G. H. PLATT



Mystery of a non-railway

Sir, — *Bradshaw's Manual* for 1900 announced under Rhondda & Swansea Bay Railway: 'A junction railway was completed from Pontrhydyfen to the South Wales Mineral Railway in July 1899'. This statement was repeated annually for the next two decades.

I have a dyeline diagram entitled: 'Port Talbot Ry. & Dks. Coy. Diagram of Port Talbot Railway Co's System'. This is Tracing No. 1053, presumably of GWR origin but, alas, undated. Access points to sidings on both the PTR and the SWMR are shown, with mileages. Other lines in the area are shown but with only meagre detail. A note alongside the SWMR indicates: 'Incline closed to traffic 1st June 1910'. There is also reference to 'Miss Talbot's Private Line', (the Oakwood Railway), and she died in 1918 so the diagram might have been prepared during the First World War.

The R&SB link from Pontrhydyfen extended just over a mile and three quarters to join the SWMR somewhat to the East of Gyfylchi tunnel. This mileage does not include a (new?) passing loop immediately to the East of the single line junction. The line is described as 'Railway No. 8' and there is a note alongside which states: 'Proposed junction of R&SBrlly with SWMRly not actually

connected'. The 1918 edition of the O.S. 25" plans of the area show the single line link in situ throughout, including details of the junction at each end. I can find no reference to this line in MacDermot/Clinker or in any article or booklet purporting to deal with the R&SBR or the SWMR. The line was never shown on any Railway Clearing House map or, to the best of my knowledge, on any Railway Junction Diagram.

Why was this line built and then hushed up? DAVID GARNETT

Kilsby Tunnel

Sir, — Having been born almost within sight of Kilsby Tunnel and knowing the district very well, I have always taken a special interest in its history and so read Mr Hemingway's article (*Journal* March 1980 p.17) with a modicum of foreknowledge. It is quite clear that the opening of the final section of the London & Birmingham Railway took place on Sunday 24 June 1838 and not, as usually quoted, on 17 September that year, though there are indications that the latter may represent withdrawal of the coach link and completion of the full train service. However, as the company's own advertisement shows [*Northampton Mercury* 23 June 1838 London & Birmingham advertisement — and *Railway Times* same date at page 340], the 9.30 a.m. from Euston to Denbigh Hall was extended to Birmingham on 24 June, an arrangement continued each Sunday thereafter.

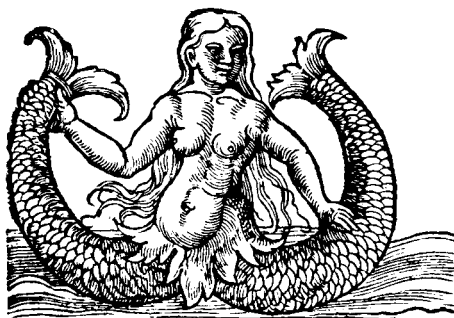
According to the Tait diaries [seen by me 35 years ago but now untraceable. William Ironside Tait, founder of the *Rugby Advertiser*, not to be confused with Dr. Tait then headmaster of Rugby School] there was a sharp reduction in the number of coaches operating between Denbigh Hall and Rugby at the end of June 1838 with remarks referring to the welcome from the inhabitants of Dunchurch (who had been complaining of the noise and dust of an almost continuous stream of coaches passing through the village) and complaints of reduced takings by toll keepers of the Old Stratford and Dunchurch Turnpike Trust. All of this suggests that other trains were making the through journey.

The diaries record the ceremony of inserting the last brick as taking place on 28 June, with great ceremony, a 'band of music' entering from each end simultaneously and meeting for a combined performance at the centre, perhaps in one of the large ventilating openings. This account is confirmed by the *Northampton Herald* which also reported the opening between Denbigh Hall and Roade on 2 July 1838 with coaches between the latter station and Northampton. On 20 July Marshal Soult and suite travelled from Euston to Birmingham, calling at Rugby for breakfast. The personnel used coaches (specially hired) between Denbigh Hall and Rugby, but the baggage and vehicles were conveyed by rail throughout.

In a newspaper interview, Mr J. Griffin, the original 'Lamps' in Charles Dickens's 'Mugby Junction' published in his extra Christmas number of *All the Year Round* 1886, recalled his days at Rugby station in 1838, including Marshal Soult's journey but otherwise nothing of special interest. I can just remember him when pointed out to me in front of his almshouse in the town, but alas I was much too young and he much too old for me to question him! However, I was old enough to talk to platform inspector George Hollick who remembered Dickens spending a whole night on the station questioning the staff, though it seems no one knew who he was.

Throughout its life inadequate drainage had been a major cause of trouble in the tunnel. I understand that it was so damp that the railway telegraph and

signalling wires were carried on posts over the top of the tunnel by wayleaves through the fields. They were very conspicuous until part of the length was placed underground. I believe the overground wires dated from 1868, presumably there being no satisfactory method of protecting them at that period. From 1950 onwards it became increasingly obvious that major remedial work would soon be needed. The road bed had become very 'soft' resulting in water being squeezed out by passing trains and thrown up against the tunnel walls. In 1953 the tunnel was closed from 28 September to 31 October. Working in shifts round the clock, weekdays and Sundays, contractors Leonard Fairclough Ltd. removed the permanent way and ballast down to invert level where Stephenson's clinker foundation resembled a sponge. A new culvert and cross drainage, partial channel drainage along the walls, erection of downpipes and other work was carried out. I had the privilege of accompanying Mr Walker, District Engineer Northampton, on two walks through the tunnel, which was strip-lighted throughout. We also went to see the model of the tunnel mouth erected by Stephenson in the garden of Cedar Lodge, Kilsby, where he stayed during construction of the tunnel. C. R. CLINKER



Wood engraving from a treatise on zoology
16th Century

Recent Literature

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- BOWER, A. J. Dining on Wheels: Part 1. The Prince of Wales. (*In Transport History*. Spring 1979. p 41-62)
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 SAVAGE, G. Excursion into oblivion: Pilkington's glass train. (*In Antique Dealer & Collectors Guide*. March 1980. p78-9)
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Items of Historical Interest

SOUTH WESTERN.—The death of Mr Henry Charles Lacy, whose name was much before the public during the railway times of twenty years ago, is announced. For some time he represented Bodmin in the House of Commons. He had been a member of the South Western board for upwards of twenty years. (*Railway Times* 30 January 1869)

NORTH EASTERN & NORTH BRITISH.— Arrangements are nearly completed for enabling the North Eastern to exercise their running powers over the Edinburgh and Berwick section of the North British and the new arrangement will commence on 1st May next. (*Railway Times* 13 March 1869. In the issue for 8 May it was announced that 'it had been postponed for some time.' It took effect, in fact, from 1 June 1869.)

GREAT EASTERN.—This company has decided to decline the carriage of all dangerous oils, such as petroleum. (*Railway Times* 16 January 1869)

ENGINE-DRIVERS.—Mr Cobbett, M.P., on Tuesday next, is to call attention to the petition of engine-drivers and firemen working on several lines in the United Kingdom, complaining of the excessive number of hours during which they work continuously; also to the petitions from inhabitants of certain cities, boroughs and other towns upon the same subject, and to move that a committee be appointed to enquire into the matter. (*Railway Times* 19 July 1862) [The companies about which complaint was made were the Byth & Tyne, Great Western, Lancashire & Yorkshire, London & North Western, Manchester & Sheffield, and South Yorkshire. In certain cases 16½ hours were worked out of 24, and the greatest number of consecutive hours worked was 28]

LONDON-BRIDGE HOTEL.—The first half-yearly meeting was held in the new hotel on Thursday. Dr Challice in the chair. The report expressed the regret of the directors that, owing to circumstances over which they had no control, the opening of the hotel had been delayed for the space of one month . . . The reasons for this delay were the extra work caused by the additional story (sic) increased cellarage, and the strike which took place in the building trade last summer . . . The hotel will be opened to the public on 2nd. June (*Railway Times* 31 May 1862)

MR T. C. WORSDELL.—We regret to have to announce the decease of Mr Thomas Clarke Worsdell, who died at Nantwich on the 18th ult., in the 73rd year of his age. Mr Worsdell constructed the *first* carriages for the Liverpool & Manchester, with which he remained many years. He was of first-rate ability in his profession as a coach-builder. His son, Mr Nathaniel Worsdell, has been for many years connected with the London & North Western Railway. (*Railway Times* 17 May 1862)

SOUTH EASTERN.—The Postmaster-General is now looking into the system of mail contracts with railways. The South Eastern has until recently conveyed the

mails from London to Dover by the old route of Redhill, but by the opening of the new Tunbridge route the distance has been shortened 13 miles. Lord Hartington has insisted that the mails shall be conveyed by the new route, and the allowance has been reduced, the company submitting. (*Railway Times* 13 March 1869)

Memorandum from W. Roberts, Superintendent of the line, Inverness, dated 13 August 1870, to Mr Nicholson, Strathpeffer: 'When required, all trains will stop at Mr Tennants, Auchnashellach, to pick up or set down passengers. Those joining up trains will be charged as from Strathcarron, those joining down trains as from Auchnashellach. The Guards will collect the fares from those who alight at Auchnashellach. Please note.'

A Southern Railway Instruction (25a of 20 November 1930) orders the turntable to be removed from Caterham.

* * *

It is with deep regret that we have to announce the death of Mr Charles Klapper and Mr Tom Sands in recent months. It is hoped that more suitable obituary details will be available in time for the November issue.

Charges for advertisements: £15 *full* page and £10 *half* page. Remittance should be sent, with camera-ready copy, to Mr Pat McCarthy, 6 Carisbrooke Close, Wistaston, Crewe, CW2 8JD.

All copy for the November issue is to be with the Editor by 10 August. All material must be typed *double-spacing*, with a margin of 1½ inches. This is necessary for making editorial notes.

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