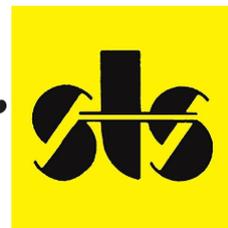




The Railway Revolution

Les Turnbull
BA Med MNEIMME



A joint lecture between NEIMME and the Stephenson Locomotive Society

Les Turnbull is a modern historian who has worked as a schoolmaster, university lecturer and senior educational advisor. He has served as a volunteer and trustee at the Institute over the last two decades and is the author of several books on mining history. His latest book 'The Railway Revolution'^[1] has made a study of the transfer from road to rail transport in the seventeenth century which was the first railway revolution. Drawing primarily upon sources from the archives of the Institute and those of the Duke of Northumberland, he argues for a new interpretation of railway history and demonstrates that the first railway revolution occurred many years before the George and Robert Stephenson came on the scene; thereby revaluating what is usually regarded as the railway revolution of early Victorian times as in fact the second revolution. Copies of the book can be obtained from the Institute bookshop at: mininginstitute.org.uk

The opening of the Stockton and Darlington Railway in 1825, followed by the building of the first inter-city railways between Liverpool and Manchester and London and Birmingham, earned George Stephenson the title of 'father of the railways'. These events formed the basis of the traditional view that the railway revolution occurred in the mid nineteenth century which is embodied in the national curriculum of our schools and the national psyche of the country at large.

But what was revolutionary about these events? Certainly not the railway for by 1825 there was a least 89 networks of lines serving the Northumberland and Durham coalfield (Fig. 1) several over one hundred years old and some dating back to the early sixteenth century. Nor was passenger travel new for the Swansea and Mumbles Railway had provided transport for visitors to Swansea Bay since 1807 and Akenside's guide to Newcastle upon Tyne advised tourist wishing to visit a coalmine to use the underground railway from Scotswood to East Kenton colliery. Nor were steam engines new – neither stationary nor travelling. John Curr had built the first stationary engine to haul coal waggons up the hill to Birtley Common in 1805 and others were subsequently built, both underground and on the surface.

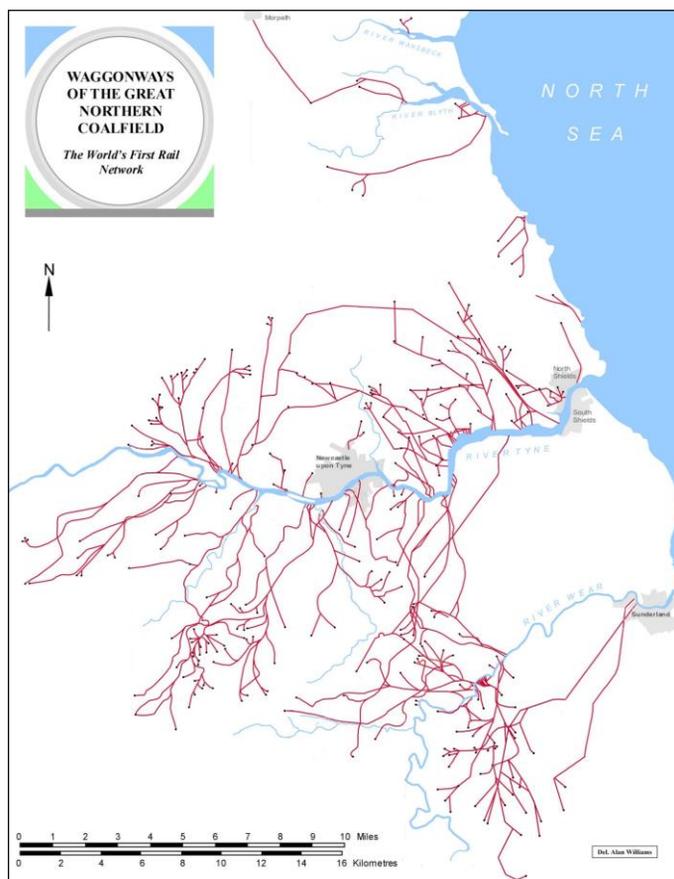


Figure 1: Wagonways of the Great Northern Coalfield^[2]





Travelling engines, now known as locomotives, were built to the designs of Richard Trevethic, John Blenkinsop, William Chapman and William Hedley – all before Stephenson experimented with his first locomotive for Killingworth Colliery. However, what was revolutionary about these events was that they marked the beginning of the national network; that time was standardized at Greenwich Mean Time and clocks became a feature of stations to enable the railway timetable to function; and that the standard gauge of the track was enforced throughout the country.

However, all these events marked the second railway revolution – the first revolution, the transfer of traffic from the road to the rail – occurred during the seventeenth and eighteenth centuries. There were waggonways in all the coalfields but because the Northumberland and Durham Coalfield was by far the largest in Britain – indeed the world – at this time, the skills of building and operating railways were developed to the greatest extent in this area. Indeed, railways were referred to by overseas visitors as Newcastle Roads. There was a period of transition during the late eighteenth and early nineteenth centuries when the management at the collieries experimented with iron rails and steam engines in an effort to deal with the need to expand the capacity of the railways at a time when horses and their feed were becoming increasingly expensive largely due to the Napoleonic Wars. These events were a prelude to the second revolution of the mid nineteenth century.

Before the coming of the railway, coal was transported by pack horses, carts and wains often along specially designated coal roads. The archives of the Duke of Northumberland contain detailed records of the road transport system at Whitley Colliery on the eve of the changeover to rail transport. They show that transport was seasonal and greatly influenced by the demands of the farming community who provided the carts, wains, horses and men. More importantly, they enable us to quantify precisely what was required to move a given quantity of coal in any particular week. In the week ending 19th July 1689, for example, 1,118½ tons were moved by 19 wains and 30 carts during six working days. This required 1,990 journeys and involved 49 men and at least 68 animals. When the railway was introduced about a year later, the same amount could be moved in 732 journeys by 13 men and 13 horses using 30.5 cwt. waggons. The transfer from road to rail represented a saving of 73% in manpower and 80% in horsepower. Also, the capacity of the transport system was almost trebled. This was the first railway revolution. Railways were cheaper since they required fewer men and horses; but also, railways were more efficient – more coal could be moved and greater profits made. Exactly these points were made by William Coatsworth when advising the Grand Allies, the region's largest consortium of coalowners, to build the Tanfield Railway to Dunston.

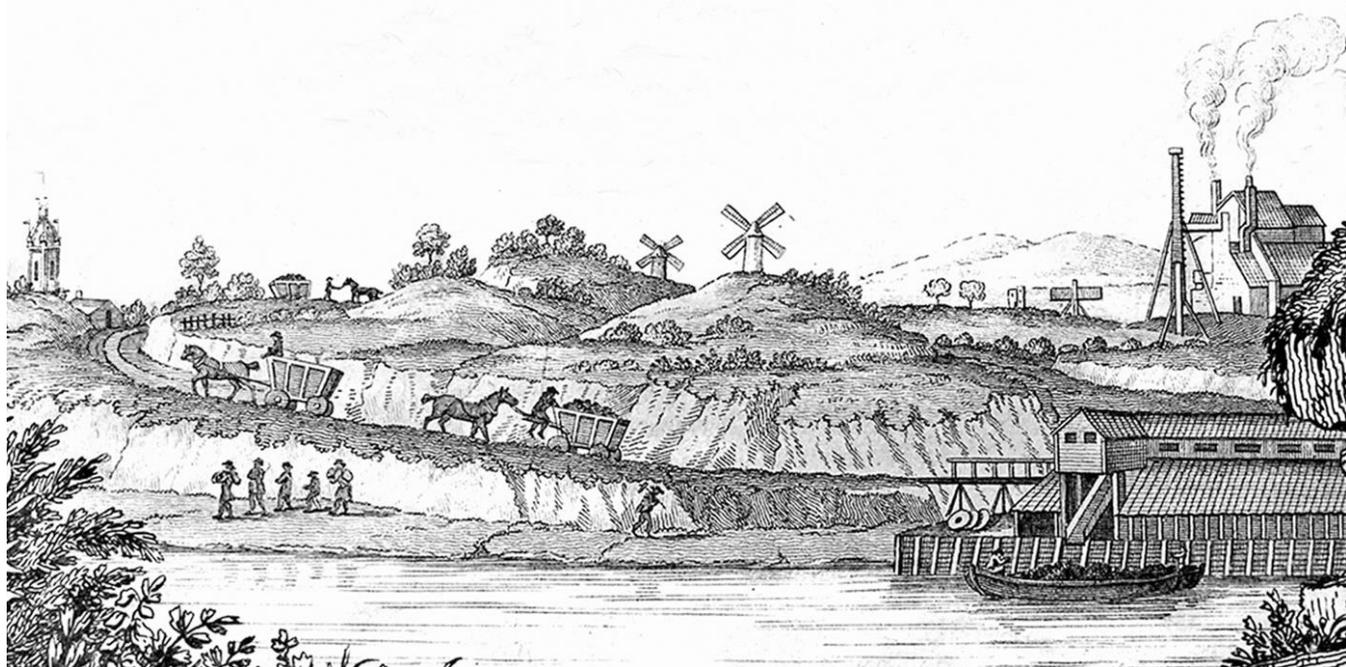


Figure 2: Thomas Bewick's Cartouche for John Gibson's Map of 1787





Besides offering a new interpretation of the standard history of the railways, the book argues for a new evaluation of the importance of the waggonway networks in the coalfield: these early railways cannot be dismissed as simple horse drawn tramroads – a rural diversion before Stephenson and the main business of steam locomotives and iron railways came along. These waggonways were the busy transport arteries of the world's largest coalfield. The building of the bridges, embankments and cuttings were major civil engineering projects. This was obvious to contemporaries: one of Newcastle's early historians, Henry Bourne the curate at All Saints, remarked in 1736 that 'these Waggon-ways ...may Vie with some of the great Works of the Roman Empire'. Minds of the caliber of the Earl of Oxford, the great antiquarian Dr William Stukeley, the learned Midlothian coalowner Sir John Clerk, Gabriel Jars a distinguished member of the Academy of Science in Paris, and Reinhold Angerstein, an industrial spy from the Swedish Academy of Ironmasters – all were fascinated by the railways of the Great Northern Coalfield. They were also captivated by the Newcomen steam engines used for pumping water from the mines.

The distinguished artist Thomas Bewick's, best remembered for his engravings of wild life, provided the cartouche for William Gibson's map of the coalfield first published in 1787 (Fig. 2). This is the best contemporary illustration of how the early railways of the Great Northern Coalfield worked. The colliery is a modern one employing steam engines for haulage and pumping. The railway led from the pits to the staith, a large wooden structure for storing coal, on the banks of the river. At first the gradient was gentle and in the waggonmen's favour but there was steep drop to the staith which required special measures. The driver is shown uncoupling the horse as a safety measure to avoid injury to the animal on the dangerous descent. He controls the waggon by sitting on the convoy, a large lever used to brake the waggon by applying pressure to the rear wheel. The horse is used to pull the waggon back to the pits. A keelboat is shown loading at the staith. This lighter will ferry the coal to the sea-going vessels at the mouth of the river some ten miles or so to the east.

The Railway Revolution

The book 'The Railway Revolution' is in two parts: part one is a history and part two is a directory of the early railways of the Great Northern Coalfield. Many of the rare maps in the NEIMME archives, one of the most important sources for the study of early railways, are reproduced within the directory. The lecture, which was given to mark the launch of the book, dealt only with the first chapter of part one. The second chapter, The First Great Western Railways, looks at the nature of the railway revolution as revealed in a detailed study of the waggonways serving the collieries within the Duke of Northumberland's royalty at Hedley in the Tyne Valley. This provides some understanding of the characteristics of industrial railways during the seventeenth and eighteenth centuries. Chapter Three, Pages from an Engineer's Notebook, uses the notebook of Richard Peck, an important builder of railways and steam engines, as the starting point for a discussion upon the progress of the revolution within the area now known as the City of Newcastle. This and other documents, mainly from the NEIMME archive, are used to identify the whereabouts of the lost railways of the area. Chapter Four, Towards the Second Railway Revolution, is a detailed study of the railways serving Kenton and Coxlodge collieries which demonstrates that the steam locomotive, the iron road and passenger travel were all present before George Stephenson began the second railway revolution.

References

- [1] Turnbull, L. (2019). *The Railway Revolution: A Study of the Early Railway of the Great Northern Coalfield 1605-1830*. North of England Institute of Mining and Mechanical Engineers.
- [2] Turnbull, L. (2012) *Railways Before George Stephenson: A Study of the Waggonways in the Great Northern Coalfield 1605-1830*. North of England Institute of Mining and Mechanical Engineers

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