

‘The whole of the approaches ... are full of difficulties’: early proposals for railways in Cork city, c.1835-1850

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THE BUILDING OF THE FIRST RAILWAYS IN CORK TESTED SOME OF THE GREATEST engineers of the nineteenth century. The problem was caused by topography: the city’s distinctive terraced skyline is the result of the hills – more pronounced to the northside – that rise on both sides of the River Lee. While these steep gradients did not stop the building of turnpike and grand jury roads in the Georgian era, early steam engines and railway technology demanded much more gentle inclines.¹ How this affected Cork’s railways is immediately apparent to any visitor arriving by train today: no sooner does the city come into view than it vanishes as the railway loses height, eventually plunging into a lengthy tunnel beneath Collins Barracks before emerging by the quays and what remains of the port. This route was the eventual answer to a question first considered by engineers in the 1830s – how to drive a railway into the centre of Cork city.

This short article sheds some light on a long-forgotten and rather extraordinary scheme for an ‘inclined-plane’ railway down the north side of the city. The engineer who proposed its construction was Charles Blacker Vignoles (1793-1875) (Plate 2), born in county Wexford, who was tasked with surveying a railway that would connect Dublin and Cork.² Vignoles had designed Ireland’s first commercial railway, the Dublin & Kingstown (now Dún Laoghaire) Railway, and in his report on Cork’s future railways he proposed a series of schemes to navigate the hills and valleys surrounding the city.³ As part of his work he produced some fine maps and section drawings, which now survive in the archives of Trinity College Dublin and are reproduced here.⁴ Some of Vignoles’ proposals were wildly ambitious and represent a curious moment in the ‘unbuilt’ history of the city.⁵ They also have something in common with the debates of our own time regarding the exact route of Cork’s next major transport link – the motorway to Limerick, and how this will weave its way through the north of the county and into the city proper.⁶

1 – *The Gogginshill tunnel, south of Cork city, built 1849-51 as part of the Cork & Bandon Railway (later the Cork, Bandon & South Coast Railway)* (photos by the author unless otherwise stated)



2 – Charles Blacker Vignoles (1793-1875)
 from O.J. Vignoles, *LIFE OF CHARLES BLACKER VIGNOLES ...*
A REMINISCENCE OF EARLY RAILWAY HISTORY (London, 1889)

Vignoles' schemes for Cork city's railways were produced as part of his work for the Irish Railway Commissioners, active between 1836 and 1838.⁷ Established by the Westminster parliament as a response to the increasingly crowded field of future Irish railways proposed by various private companies, the commission was given three main tasks – first, to recommend a 'general system for railways in Ireland' by asking leading engineers of the time to survey routes from Dublin to other parts of the country; second, to suggest how these railways might be built and by whom, and what might be their economic rationale; and finally, they were asked to ascertain which 'port or ports on the west or south coast' might be suitable for a new transatlantic packet route linking Britain, Ireland, and North America with railways and steamships.⁸ The Commissioners divided the country into three broad regions. In the north and north-west, the engineer John Macneill (c.1793-1880) surveyed lines that

would have linked Dublin with Armagh and Enniskillen.⁹ In the south and south-west, Vignoles traced a route to Cork with branches to Kilkenny, Limerick and elsewhere.¹⁰ In the west the commissions argued there would be no need for railways. Connacht had too little economic activity, they believed, and existing roads and canals would suffice.¹¹

Throughout their deliberations, they were keen to avoid repeating what they saw as a fatal flaw in earlier Irish public works projects – the construction of two broadly parallel canals, the Grand and the Royal, serving a broadly similar region of the midlands, thereby splitting trade between them and making both essentially unprofitable. 'There can be no doubt that one canal, with suitable branches', they argued, 'could have equally effected the object now attained by both. Thus a profitable return might have been obtained by the capitalist, and a waste of at least two millions of money prevented.'¹² This rationale informed their suggestions for railway lines. Instead of building individual railway lines connecting Dublin with provincial cities and towns, they proposed great trunk railways north and south, with branches where necessary.¹³ The fact that the Dublin to Cork railway became known as the Irish 'premier line' can be traced back to this important decision.¹⁴ Today passengers for Waterford, Tralee, Limerick and even Galway use some part of this trunk railway before diverting onto branch lines. However, in the 1830s, the Commissioners' most controversial conclusion – and the one that eventually doomed the entire project – was that the British state, and not private companies, should offer financial guarantees to companies that ran the Irish railway network. They claimed that

unless Irish railways were backed by the state, there was no hope that they could ever return a surplus, and ‘all thoughts of a general Railway system in Ireland must be abandoned’.¹⁵ This was a bold suggestion that ran foul of the prevailing *laissez-faire* concepts of the time. When the ‘premier line’ was built in the 1840s and 1850s during the Great Famine, it was not a state-owned project but a private one, controlled by the Great Southern & Western Railway (GS&WR).

For Vignoles, the politics of Irish railways was less of a concern than the surveying and engineering that would be required to build them. He had already significant Irish engineering experience; not only had he designed the Dublin & Kingstown line in the early 1830s, but he had also been involved in surveying various speculative proposals in the south, including a line between Dublin and Valentia Harbour (for future transatlantic traffic), and a much shorter route from Cork to Passage West.¹⁷ In Britain he had acted as the engineer for the important Sheffield & Manchester Railway, a difficult and mountainous route that necessitated lengthy tunnelling.¹⁸ Furthermore, in the 1820s he had worked as an engineer and a cartographer in South Carolina and Florida.¹⁹ This experience with maps proved particularly useful in the winter of 1836 when travelling through the south of Ireland surveying lines for the Railway Commissioners. His daily correspondence survives in the National Archives in Dublin, and his private diary, which at times is a challenge to decipher, sets out the various ordeals that he faced while travelling and is now at the British Library in London.²⁰ While both sources concentrate on the main trunk route from Dublin and the proposed lengthy branch to Castletownbere in Bantry Bay (which I have written about elsewhere), they also comment briefly on his plans for railways in Cork city.²¹

Indeed, the problem of building a railway line from Dublin to Cork was inseparable from the proposal to develop Castletownbere in Bantry Bay as a future transatlantic packet station.²² Though this scheme was never built, it would have involved a lengthy and expensive branch off the main line to Castletownbere via Gougane Barra and Glengarriff.²³ For Vignoles, what linked the Castletownbere and the Cork city routes was the tricky geography formed by the valleys of the upper Lee and one of its tributaries (the Bride), and the likelihood that a railway from Dublin to Castletown would have to diverge from the main line at Blarney, quite near to the city.²⁴ As Vignoles continued his horseback survey in miserable weather (recorded in painful detail in his diary), he began to better understand the landscape of the region and suggested there were no fewer than four different ways (Plate 3) in which the railway could reach its principal terminus in Cork.²⁵ These were, anticlockwise, from north to south:

- a from the north, keeping high as far as the barracks and then rapidly descending 61m (200ft) in less than a mile with an ‘inclined plane’ (discussed below);
- b from the north, ending somewhat short of the city centre at Blackpool (almost 30m (100ft) above sea level);
- c from the west, branching off the Castletown railway and entering the city near Carrigrohane;
- d from the west, reversing off the Castletown railway and then staying further south near Chetwynd.

Precisely none of these schemes correlate with the Dublin-Cork railway that was later



3 – Map showing various railway routes into Cork city, surveyed by Charles Vignoles in 1836-38 (labels attached by the author)

opposite, 4 – Section drawing showing Vignoles’ proposal for a railway line entering Cork city from the north, using an inclined plane (scheme [a])

5 – Section drawing showing Vignoles’ proposal for a railway line entering Cork city from the north ending at Blackpool (scheme [b])

(all illus: Irish Railway Commissioners, courtesy Board of Trinity College Dublin)

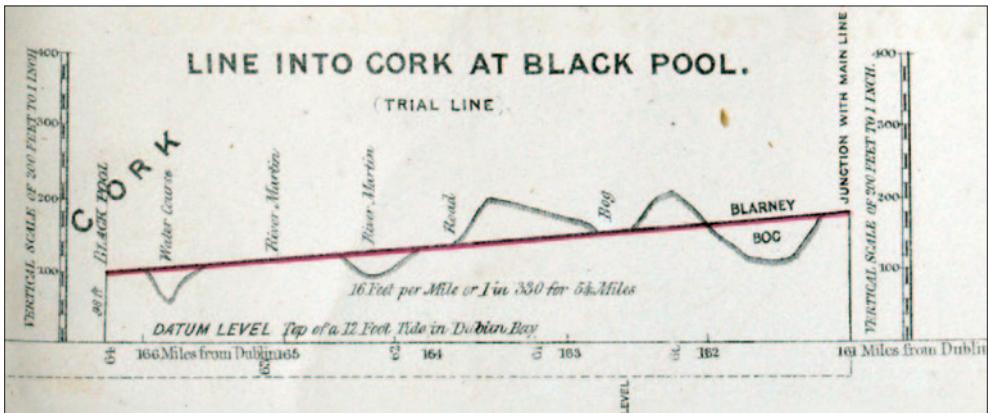
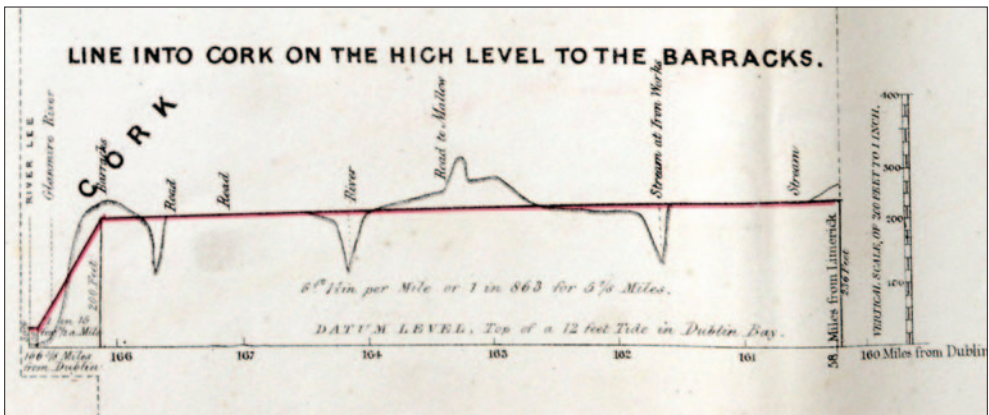
built, though route [b] is an approximation in some respects (as discussed below). Routes [c] and [d] are broadly similar to the lines that eventually linked Cork with Macroom and Bandon respectively. The first suggestion [a], by far the most extraordinary, was never built in any form, yet it was Vignoles’ considered recommendation to the Commissioners. He explained his thinking with the help of the above map and a series of section drawings showing proposed gradients in a lengthy passage that is worth quoting in full. He began by setting out what he saw as the topographical realities that justified the use of an inclined-plane approach (route [a]) to the city:

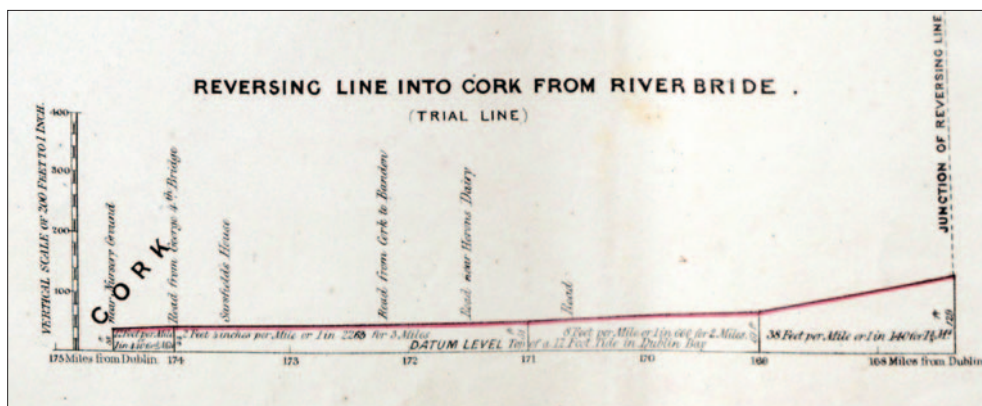
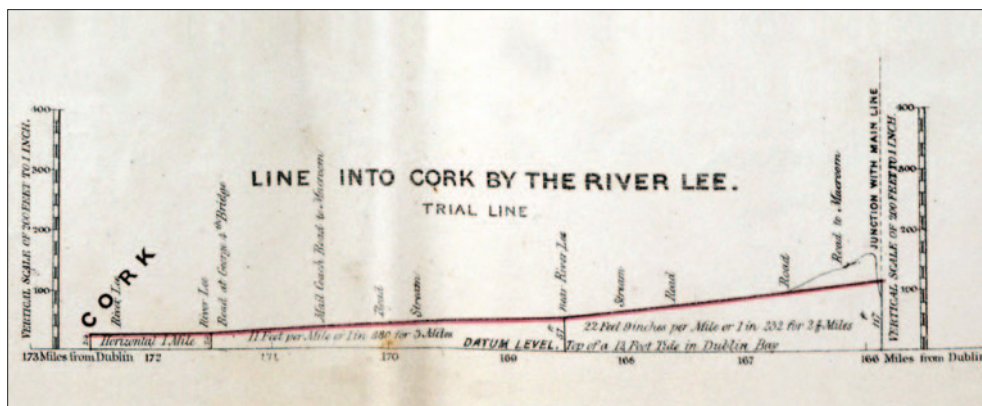
From Blarney to enter Cork ... the descent will be as gentle as 1 in 868, for something under six miles, to Cork barracks, from whence an inclined plane, to be worked by stationary power, must be made, if it be required to connect the Railway with the river Lee and harbour of Cork. The terminating point at Cork barracks being 200 feet above high water, and the distance to the river little more than half a mile, it will be seen on inspecting the detailed section, that the plane will have to descend as much as 1 in 15 [Plate 4]; an inclination, it must be confessed, highly objectionable, and which can only be justified by an extreme emergency. This

inclination might probably be softened; that is, the length of the plane could be increased by making the descent diagonally on the hill side, either pointing up stream towards St. Patrick's bridge, or down towards Glanmire. If so, the chief objection will be removed, as the entrance of a Railway into a large town by an inclined plane worked by stationary power is not unprecedented. At Glasgow, in Liverpool, and even into London, it has been thus proposed, and in the latter two instances executed, though by planes considerably easier than the above.²⁶

Vignoles was clear that this radical solution was not something he proposed lightly. Another solution, route [b], was to simply stop short of the city in Blackpool – similar to what was eventually built – but without the lengthy tunnel that eventually gave access to the city centre:

Several other approaches into Cork have been tried – one by a line from Blarney, to terminate at Blackpool, on a level about 100ft above high water [Plate 5]; but it would scarcely be practicable to extend the Railway from this latter station to the harbour without a very considerable expense, while an inclined plane and stationary power would still be requisite. This line is, moreover, inconveniently situated with respect to level at Blarney; and its adoption would induce a change





6 – Section drawing showing Vignoles’ proposal for a railway line entering Cork city from the south along the south bank of the River Lee (scheme [c])

7 – Section drawing showing Vignoles’ proposal for a railway line entering Cork city from the south passing through Bishopstown and near Chetwynd (scheme [d])

(Irish Railway Commissioners, courtesy Board of Trinity College Dublin)

in the course of the first part of the Berehaven Line, between Blarney and the river Lee at Ballincollig, rendering it much more expensive, while the gradient from Blarney to the summit would be increased to 30 feet to the mile. Should the extension from Cork barracks to the harbour not be considered by the Commissioners so advisable as to terminate the Railway at Blackpool, it may be possible to find a line from the latter place to Blarney, not exceeding the rate of 1 in 237, to unite with the line on the higher level at that point. But I think the advantage of uniting with Cork harbour overbalances the inconvenience of the inclined plane, the main objection of which is the steepness.²⁷

Finally, routes [c] and [d] depended on the Castletownbere branch being constructed, which then presented less onerous topographical challenges on approach to the city centre. Both, Vignoles indicated, were rather circuitous:

Other modes of approaching Cork are to be found by diverging, or rather by reversing, in a south-eastward direction, from the Berehaven Line, either at the banks of the Lee, or of the Bride, and terminating in front of the new gaol, and, if necessary, to be thence extended to pass quite through the city [Plate 6]; otherwise, to keep round entirely to the south of Cork and to form a junction with the Cork and Passage Railway on the Slob, below the Monerea Marsh [Plate 7]. By each of these lines on the lower levels, a continuous Railway line ... would be obtained; but either of them would add 10 miles to the distance between Dublin and Cork, and, although much cheaper lines, and with superior gradients to those on the higher levels from Blarney, their additional length, as branches into Cork, would scarcely allow of any diminution in the total cost of construction. It is only in the event of the [transatlantic] packet station being fixed at Berehaven, and a very direct line being required from thence to Cork, that these lines on the lower level need be considered; and even then the gain in distance would scarcely justify the additional length of Railway to be made.²⁸

In conclusion, he stressed that there were no easy ways to reach the centre of the city, something which later engineers were also forced to acknowledge: ‘The whole of the approaches into Cork are full of difficulties, and it has required a great deal of time and attention to examine and determine the most eligible route.’²⁹

Despite such alarming language (‘highly objectionable’, ‘extreme emergency’, ‘not unprecedented’), Vignoles suggested that an inclined plane would be the best solution for linking Ireland’s two main cities, to be built somewhere near to what is now Collins Barracks. What he proposed was a railway far steeper than a normal locomotive could operate (a more normal gradient in these years would have been around 1 in 150, ten times leveller than his suggested 1 in 15). Passengers and goods would have to switch their mode of transport onto a series of carriages raised and lowered by a series of ropes and stationary engines. The obvious danger was of a mishap leading to run-away carriages and almost certain death and destruction. Yet Vignoles, like many other young engineers of his generation, had a remarkable confidence in the possibilities posed by new steam technologies and had suggested a similarly ambitious railway powered by ropes and engines across Dublin’s quays linking Westland Row (Pearse) with Kingsbridge (Heuston) stations.³⁰ Inclined railways were more common near mines than on mainline passenger routes, and Vignoles would presumably have been aware of their adoption in George Stephenson’s Bowes Railway (1826) in county Durham, or the Cromford & High Peak Railway (1831) in Derbyshire, but the history of these workings suggests that had such a design for Cork city been attempted, it could not have been entirely safe, convenient, or economical.³¹

The majority of Vignoles’ fieldwork over two weeks in December 1836 was occupied surveying the Dublin-Cork trunk line, the lengthy Castletownbere branch, and, to a lesser extent, a route from Limerick to Tarbert. He spent only two days in or near Cork city, on 11th and 12th December, and this was largely occupied with private work for the proposed Cork & Passage West Railway. He was also not by any means the only person interested in bringing railways to Cork at this time. Cork’s corporation, various local

committees, and other engineers also came forward with their own ideas, often criticising Vignoles and his work.³² A full analysis of these local agendas deserves a much lengthier history than is possible here. Indeed, Vignoles' private diary would suggest that he gave only a passing thought to the termination of the main trunk line in Cork, occupied as he was with more exciting schemes for Castletownbere and private work. Near Mallow, for example, his comments simply that he found 'the point of crossing the River Blackwater and ... determined the proper course for the Railway line ... up the Valley to the summit and afterwards by the Valley of the River Martin to Cork'.³³ He added that he was 'considering the various lines through the County of Cork to be explored. At Night travelled from Cork to Macromp [Macroom] ... Articles for defence from the Weather bought at Cork.'³⁴ Some weeks later, in private correspondence with the staff of the Railway Commissioners, he mentioned his proposal for an inclined plane to the north of the city, but he also suggested an equally intriguing alternative – a 'perpendicular fall using stationary power':

The general route from the Blackwater will be parallel to the new Turnpike Road from Mallow to Cork, as far as the six Mile water then crossing into the valley of the Martin River and descending the same to Blarney, thence passing to and following the stream ... which flows in to Cork by ... Blackpool. Should it be considered desirable to penetrate further in to Cork, it can be done by skirting the Hill side at almost any level, and if the Quays are to be approached this may be accomplished by an inclined Plane, or by a perpendicular fall using Stationary Power in the manner proposed at Glasgow.³⁵

This would, in effect, have been a kind of elevator, and perhaps it was too ambitious even for Vignoles as he omitted it from his final report. Indeed, the Railway Commissioners, who had employed him to make these surveys in the south and west of the country, were reluctant to endorse some of his recommended routes. The lengthy branch to Castletownbere, for example, to facilitate transatlantic shipping came, they argued, with 'considerable extra cost' but few benefits. Its 'remote situation and distance from establishments or resources' convinced the Commissioners 'to dismiss all further consideration' of its construction, and indeed of other proposed branches to Tarbert or Valentia in county Kerry.³⁶ This brought into some doubt Vignoles' routes [c] and [d] for entering the city. The Commissioners instead recommended Cork harbour for transatlantic shipping, if such a route were to be developed. They also distanced themselves from Vignoles' plans for a railway through the centre of Dublin. While including it in their report, they added that 'we wish it to be clearly understood, that we do not recommend its present adoption.'³⁷

At its core, the final report of the Railway Commissioners put forward an argument for state involvement or control of Ireland's railway system. This ran counter to the

8 – Robert Lowe Stopford (1813-1898), *MONARD RAILWAY VIADUCT (GS&WR)*
1849, watercolour on paper, 49 x 71 cm (Crawford Art Gallery, Cork)

9 – Robert Lowe Stopford, *KILNAP RAILWAY VIADUCT (GS&WR)*
1849, watercolour on paper, 51 x 72 cm (Crawford Art Gallery, Cork)

EARLY PROPOSALS FOR RAILWAYS IN CORK CITY





laissez-faire politics of the time, and various engineers and private companies resisted the creation of what they saw as an unfair state monopoly. The Commissioners' arguments fell on deaf ears and the British government abandoned the whole proposal.³⁸ There was little support for the scheme in the House of Commons in March 1839, and the return of the Tory party to power in 1841 under Robert Peel spelled the end for the scheme, however visionary or daring we might now see it.³⁹ In their place came the railways of private companies in the 1840s and 1850s who had to contend with the same issues of topography that Vignoles had understood in the 1830s. This is apparent in the surviving structures of Cork's early railway architecture. Between 1845 and 1849, the GS&WR built their line linking Dublin with Cork. This reached Blackpool to the north of Cork in October 1849.⁴⁰ As Vignoles predicted, the route from Mallow to Blackpool demanded two substantial masonry viaducts over river valleys at Monard and Kilnap (Plates 8, 9), painted during construction by the Irish artist Robert Lowe Stopford (1813-1898) – a vivid testimonial to the heavy engineering of the line.⁴¹ For the next six years, Kilbarry, adjacent to Blackpool, marked the end of the line, and some foundation works and low walls still mark the site where buildings were erected at this time as a temporary station.⁴² To reach the city centre and the quays, John Macneill oversaw the boring of a lengthy tunnel under the city (almost 1.2km in length) – something that Vignoles had shied away from in his proposals. The entrances of this tunnel are somewhat obscured today by road overbridges at both ends but it remains in continuous use.⁴³ Soon after this tunnel opened in the mid-1850s, a series of riverside railway buildings were constructed, designed in part by John Benson and still somewhat intact today.⁴⁴ They were in turn superseded within thirty years by the station that is currently in use, designed to link the railways to Dublin, Cobh and Youghal with a single curved railway in quite a confined site.⁴⁵

On the other side of the river, a multitude of railways linked Cork with Passage West, Blarney, Macroom, Bantry and elsewhere, but not necessarily following the routes that Vignoles had proposed for the tail-end of his Dublin mainline. The Bantry route,

originally the Cork & Bandon Railway, faced a similarly taxing route, climbing the hills to the south of the Lee as the Dublin railway had to the north. It followed in part Vignoles' proposed route [d] above. The outcome of this was a large iron viaduct at Chetwynd, opened in 1851 (Plate 10), and an 800m tunnel at Gogginshill, also opened in 1851 (Plates 1, 11), both of which were in regular use until 1961 and survive largely intact today.⁴⁶ Castletownbere never served as a transatlantic packet route and the closest that a railway ever got to the Beara Peninsula was Bantry in 1881 (for a time a steamer provided onward transport to Glengarriff).⁴⁷ In the city, the main railways north and south were joined in the early 1900s by a series of lifting bridges and railway lines running through the streets of the city; this continued until well into the 1970s.⁴⁸ An unexecuted proposal from this era rivalled Vignoles for its audacity and likely expense: this was a scheme to link Wexford with west Cork by new railways across Cork city, linking the most important southern and northern lines. One idea was for a high viaduct looming over the city from its southern to its northern hills. Another scheme called for a tunnel beneath the Lee, something that came into existence, for road traffic at least, only in the 1990s. None of these ambitious schemes were given serious consideration at the time.⁴⁹

The dreams and realities of railway engineering projects in Cork from the 1830s through to the end of the nineteenth century show how the topography of the city always had such a large impact on where railways could be built. This short article has drawn attention to the earliest of these proposals, and in particular to a long-forgotten scheme to build an inclined-plane railway down the north side of the city, suggested and then quickly forgotten by a young Irish engineer in the mid-1830s. Had it been built it would undoubtedly now be a heritage site of considerable international interest. In the end, a more realistic and safer route was adopted, however laborious and expensive it was to construct such a long tunnel during the latter years of the Great Famine.

11 – *The Gogginshill tunnel, south of Cork city, built 1849-51 as part of the Cork & Bandon Railway (later the Cork, Bandon & South Coast Railway)*

opposite

10 – *The Chetwynd viaduct, south of Cork city, built 1849-51 as part of the Cork & Bandon Railway*



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ENDNOTES

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- ⁴ Trinity College Dublin (TCD), School of Engineering, ENG-DOD-1, *Irish Railway Commission: Plans of the several lines laid out under the direction of the Commissioners*, 1837.
- ⁵ The history of 'unbuilt' Cork has received somewhat less attention than Dublin. For an overview, see Frederick O'Dwyer, *Lost Dublin* (Dublin, 1981); and Frederick O'Dwyer, 'Unbuilt Architecture', in Rolf Loeber et al, *Art*

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- ⁶ *Irish Examiner*, 16th April 2019.
- ⁷ There are many major gaps within existing histories of Irish railways notwithstanding the dedication of the Irish Railway Record Society and others. See, however, J.J. Lee, 'The Provision of Capital for the Early Irish Railways, 1830-53', *Irish Historical Studies*, XVI, no. 61, March 1968, 33-63; Ronald Cox and Philip Donald (eds), *Ireland's Civil Engineering Heritage* (Cork, 2013); Richard J. Butler, 'Transatlantic Visions of a Technological Modernity: geo-politics, infrastructural networks, and dreams of a North American packet railway in the west of Ireland, 1825-38' (forthcoming); Peter Hession, 'Imagining the Railway Revolution in Pre-Famine Ireland: technology, governance, and the Drummond Commission, 1832-39', in Richard J. Butler (ed.), *Dreams of the Future in Nineteenth-Century Ireland* (forthcoming).
- ⁸ *Second Report [on] Railway Communication ... in Ireland*, H.C. 1837-38 (145), xxxv, iii.
- ⁹ *ibid.*, Appendix A, no. 4, 45-68.
- ¹⁰ *ibid.*, Appendix A, no. 1, 1-31.
- ¹¹ *ibid.*, 6, 45-47.
- ¹² *ibid.*, 13.
- ¹³ *ibid.*, 15-29, 36-47.
- ¹⁴ The phrase 'premier line' to describe the Dublin to Cork railway was in use by the late nineteenth century. See, for example, *Skibbereen Eagle*, 21st February 1891.
- ¹⁵ *Second Report [on] Railway Communication ... in Ireland*, 40, 53-57, 64-65, 79-80, 85, 92, quote on 56.
- ¹⁶ Oliver Doyle and Stephen Hirsch, *Railways in Ireland, 1834-1984* (Dublin, 1983) 22-24.
- ¹⁷ *First and Second reports from the Select Committee appointed to inquire into ... Public Works in Ireland*, 131-37.
- ¹⁸ Vignoles, *Life of Charles Blacker Vignoles*, 230-44.
- ¹⁹ Keith H. Vignoles, 'Charles Blacker Vignoles in South Carolina and Florida, 1817-1823', *South Carolina Historical Magazine*, LXXXV, no. 2, April 1984, 83-107.
- ²⁰ National Archives of Ireland (NAI), Dublin, OPW 1/10/3, Letters from Charles Vignoles to Harry D. Jones, Irish Railway Commissioners, 1836-37; British Library, London, Add MS 34528, Diary of Charles Blacker Vignoles, Jan 1834 - Dec 1837.
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- ²⁶ *Second Report [on] Railway Communication ... in Ireland*, Appendix A, no. 1, 8.
- ²⁷ *ibid.*
- ²⁸ *ibid.*
- ²⁹ *ibid.*
- ³⁰ *ibid.*, no. 2, 32-34. Detailed drawings for this scheme survive in TCD, School of Engineering, ENG-DOD-1, *Irish Railway Commission*; Maurice Craig, *Dublin, 1660-1860* (London, 1952) 299; Keith H. Vignoles, 'Vision and Reality: Classic Design on an Irish Railway', *Country Life*, CLXVI, no. 4279, 12th July 1979, 106-08; O'Dwyer, *Lost Dublin*, 139; Vignoles, *Charles Blacker Vignoles, Romantic Engineer*, 63-65; Niall V. Torpey, 'Irish Railway Bridges', *Journal of the Irish Railway Record Society*, XXII, no. 153, Feb 2004, 2.
- ³¹ Colin E. Mountford, *The Bowes Railway* (Birmingham, 1966); John Marshall, *The Cromford & High Peak Railway* (Newton Abbot, 1982). Both are, to some extent, now preserved as heritage sites.
- ³² See, for example, *Saunders's News-Letter*, 21st Jan 1837; *Tipperary Free Post*, 8th Sept 1838.
- ³³ British Library, Add MS 34528, Diary of Charles Blacker Vignoles, entries 11th and 12th Dec 1836.
- ³⁴ British Library, Add MS 34528, Diary of Charles Blacker Vignoles, entries 11th and 12th Dec 1836.
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- ³⁶ *Second Report [on] Railway Communication ... in Ireland*, 65.
- ³⁷ *ibid.*, 37.
- ³⁸ Anon., 'Remarks on the Irish railway commissioners' report', *Civil Engineer and Architect's Journal*, Sept 1838, 299-304; anon., 'Irish railways – Ballinasloe meeting', *Civil Engineer and Architect's Journal*, Nov 1838, 387; and further debate in the same journal for January, February, March and April 1839; George Lewis Smyth, *Observations upon the Report of the Irish Railway Commissioners* (London, 1839); *Railroads (Ireland); copy of all Resolutions and Memorials presented ... respecting Railroads in Ireland*, H.C. 1839 (154), xlvii.
- ³⁹ Vignoles, *Life of Charles Blacker Vignoles*, 250-54; R.B. McDowell, *Public Opinion and Government Policy in Ireland, 1801-1846* (London, 1952) 197.
- ⁴⁰ *Leinster Express*, 11th Jan 1845; *Freeman's Journal*, 4th April 1845; *Cork Examiner*, 19th Oct 1849; K.A. Murray and D.B. McNeill, *Great Southern & Western Railway* (Dublin, 1976) 16, 18, 178.
- ⁴¹ TCD, School of Engineering, ENG-DOD-1, *Irish Railway Commission*, diagram sections to accompany plan no. 8; Crawford Art Gallery, Cork, cat. nos 1444-P and 1445-P, Robert Lowe Stopford, *Monard Railway Viaduct and Kilnap Railway Viaduct* (among others), 1849.
- ⁴² *The Builder*, 5th Oct 1850, 473; Dictionary of Irish Architects (DIA), www.dia.ie.
- ⁴³ *Cork Examiner*, 23th Aug 1847 and 7th Aug 1854; DIA, www.dia.ie.
- ⁴⁴ The tunnel is inscribed with the date '1855', *The Builder*, 20th Oct 1855, 502, and 17th Jan 1857, 38; *Dublin Builder*, 1st July 1860, 295-97; DIA, www.dia.ie.
- ⁴⁵ *Irish Builder*, 1st and 15th Feb and 1st April 1891, 33, 46, 73, 15th February 1893, 47; DIA, www.dia.ie.
- ⁴⁶ *Freeman's Journal*, 16th Aug 1850; *Nenagh Guardian*, 11th Jan 1851; *Cork Examiner*, 13th Aug and 19th Dec 1851; Ernie Shepherd, *Cork, Bandon & South Coast Railway* (Leicester, 2005) 11-14; *Irish Independent*, 27th Mar 1961.
- ⁴⁷ *Cork Examiner*, 5th July 1881; *Southern Star*, 11th Sept 1909.
- ⁴⁸ Shepherd, *Cork, Bandon & South Coast Railway*, 67-72, 86.
- ⁴⁹ *Cork Examiner*, 12th Nov 1889 and 5th Mar 1890; Shepherd, *Cork, Bandon & South Coast Railway*, 68. The Jack Lynch road tunnel beneath the River Lee (the N40) was built in 1995-99.