

The Royal Commission on London Traffic 1903-5 and the Proposed North Metropolitan and Regent's Canal Monorail

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The Royal Commission Appointed to Inquire into and Report upon the Means of Locomotion and Transport in London on 10 February 1903 decided understandably at its first meeting to give itself the short title of 'Royal Commission on London Traffic'. It worked hard, interviewed numerous witnesses, received masses of data and many suggestions, and published its report during 1905-6. There were eight volumes of large format, occupying in all just 18 inches of shelf-space. There had been other Royal Commissions and investigations of London's traffic problems, but this one worked at a crucial period when electric traction and the internal combustion engine were beginning to have a big influence. So its report is marvellously interesting. It is referred to from time to time by transport writers, but it is probably not very well-known. The purpose of introducing it here is to explain the source of information about an interesting monorail project based on the Lartigue monorail system. It seems worthwhile, however, first to say something more general about the contents of the report.

I The Royal Commission's Report

The concern of the Commission may be summarised as Tramways, Railways, and Street Traffic, and their integration. Almost all conceivable data relating to these matters are tabulated, graphed, and discussed. On the basis of this evidence, and of suggestions made by the Commission's own Advisory Board of Engineers and by many outside people, the Commission made recommendations. These were basically that the present means of locomotion and transport were seriously defective, that street-widening schemes should be adopted, that tramways should be built into an interconnected system running right through London from side to side, that railways should be extended and better means of passenger penetration into central areas provided, that underground electric railways should be built and extended, preferably on a shallow-tunnel basis rather than tube unless this proved too expensive, that urban railways traversing London should have four tracks to provide for fast and stopping trains, and that road traffic regulations should be made and a Traffic Board set up.

The Commission's Advisory Board of Engineers made many recommendations; among them was a proposal for two new traffic arteries of great width, with ample provision for street tramways and four lines of electric railway underneath. Associated with these were to be many new tramway schemes, including four in subway as follows:

- (1) Knightsbridge to Aldgate
- (2) Leman Street, under River Thames, to southern approach to Tower Bridge
- (3) Charterhouse Square, under Aldersgate, to the GPO
- (4) Grosvenor Gardens, under Hyde Park, to Edgware Road.

Of all those schemes which involved major engineering work, only the last-mentioned subway scheme was supported by the Commission itself.

A proposal somewhat similar to the two great traffic arteries mentioned above was submitted independently by Mr C. S. Meik and two colleagues; it comprised a north-south route and an east-west route, total length 48 miles, giving roadways, tramways, and a suspended monorail railway similar to that between Elberfeld and Barmen in Germany, still operating today and often known as the Wuppertal Monorail. The point of the monorail system was that it was so much cheaper than an ordinary underground railway, and even cheaper than an ordinary railway run overhead (such as the Liverpool Overhead Railway). Nevertheless, the cost of Meik's scheme was a massive £50 million, although it was expected to recoup much of this by sale of adjacent land at much-enhanced values. Details are in the Report, Vol. 3, Appendix 47, and Vol. 6, Plates 57-66.

It was hardly to be expected that the Commission would make recommendations in favour of ambitious schemes of these types. Even in more ordinary matters, however, their judgment was somewhat conservative. They faced the prospect of competition from motor omnibuses (Vol. 1, p.44):

... we think that, on routes suitable for tramways, where there is a large traffic, tramways will continue to be the most efficient and the cheapest means of street conveyance, and we cannot recommend the postponement of tramway extension in London on the ground of any visible prospect of the supersession of tramways by motor omnibuses.

One commissioner, Sir George Bartley, perhaps foresaw the future better. In a minority report, he disagreed and recommended that more experience be obtained with omnibuses before extending tramways in narrow streets.

One of the more fascinating but less ambitious proposals was put to the Commission by Mr F. B. Behr (Vol. 3, Appendix 54 and Vol. 6, Plates 72 a-e). It was for a Lartigue-type monorail running mainly over the Regent's Canal. It was sufficiently realistic and modest to be worth discussing in some detail.

II The Proposed North Metropolitan & Regent's Canal Monorail

Fritz Bernhard Behr, who proposed, planned, and designed this monorail line across north London in the 1890s, and presented the proposal to the Royal Commission on London Traffic in March 1904, was born in Berlin in 1842, became a naturalised British subject in 1876, and died in 1927. He had a good engineering training and much railway engineering experience. In 1885 he became associated with C. F. M.-T. Lartigue, the French engineer whose name is inextricably associated with a straddle-type of monorail system.¹ After demonstrations, the Listowel & Ballybunion Railway was constructed on this system, and opened for passenger and goods service in 1888. Behr was Managing Director of the companies which were responsible for the construction of the line, and also of the L&BR Company, which operated it under an Act of Parliament. However, he always had his office in London, and was very active in planning and promoting other schemes using the Lartigue monorail. Of these, the most important was the Lightning Express electric monorail, on which speeds up to 150 mph were to be attained. The Manchester & Liverpool express monorail, which got its Act in 1901, would probably have been built had the Board of Trade not managed to obstruct it.²

The NM&RC monorail (Behr gave it the title Railway) was not of the Lightning Express type,³ but was intended to have an average speed of about 20 mph, with very frequent stops, as can be seen from the closeness of the stations in Fig. 1. Unlike the L&BR, it was to be electrically operated, and apart from less than a mile of tunnel, it was to be essentially an overhead line. The Lartigue monorail system lent itself very well to an overhead construction, for it did not need a

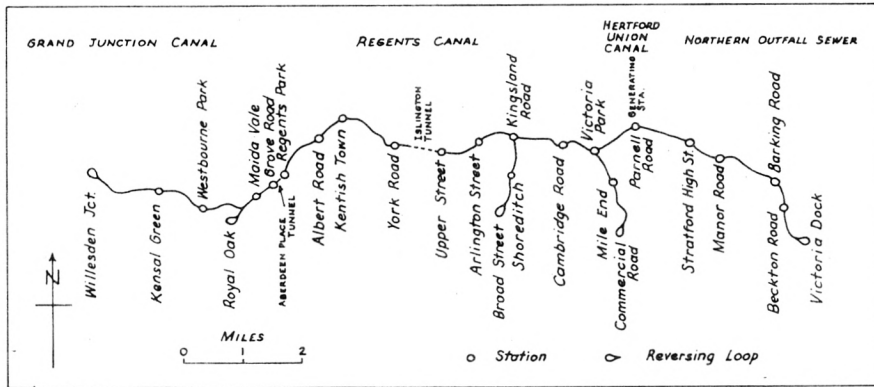


Fig. 1. Proposed North Metropolitan & Regent's Canal Monorail

flat trackbed on which to lay its rails. They were instead laid on a lattice girder structure with an A-trestle cross-section — the running rail at the apex of the A, and a guide rail along each side — and this structure was basically a rigid longitudinal girder which merely needed to be supported on towers at intervals to give an elevated railway. The obstruction to light was minimal, and the ground space occupied was very small. Behr's proposal was that for most of the route the line would follow a canal, with the towers on the tow-path or on canal land beside it. Where the canal passed under a road, the monorail would descend and also pass under if there was room; alternatively it could go in a short tube tunnel. Where the canal went into a tunnel, the monorail would have its own tube tunnels, one for each track. The various types of route-structure are illustrated in Fig. 2, where (a) shows a simple double cantilever-tower for a simple double track, (b) shows a gantry spanning the canal for a part of the route where the two tracks have to be well separated, (c) shows a double-tower arrangement for supporting a station, and (d) shows the two tracks in tube alongside the canal tunnel.

For junctions, turntable-type switches would be used as on the L&BR and explained in a previous article in this *Journal*.⁴ The line would be double track for the whole way, and at the terminuses, run-round loops would be provided for reversing, so that no switches would be needed here. Behr proposed that the trains would each accommodate 172 passengers, and that the service should comprise 330 trains a day in each direction over each section.

The plan to follow the canals meant that the line had to take in some very sharp curves. The monorail system was able to do this much better than an ordinary two-rail line. Behr planned for frequent curves down to 62 ft radius, and saw this as no obstacle to operation. There were to be some short steep gradients, the steepest being 1 in 20 with a length of 175 yards.

The route is shown in Fig. 1, where all the proposed stations are marked and named. The westernmost section lies along the Grand Junction canal, but seems to have been regarded by Behr as a branch. He regarded the main line as from Royal Oak (on the GWR and Metropolitan lines), along the Regent's Canal to Victoria Park, then along the Hertford Union Canal for a short stretch, and then along the Northern Outfall Sewer, terminating at the Victoria Dock.

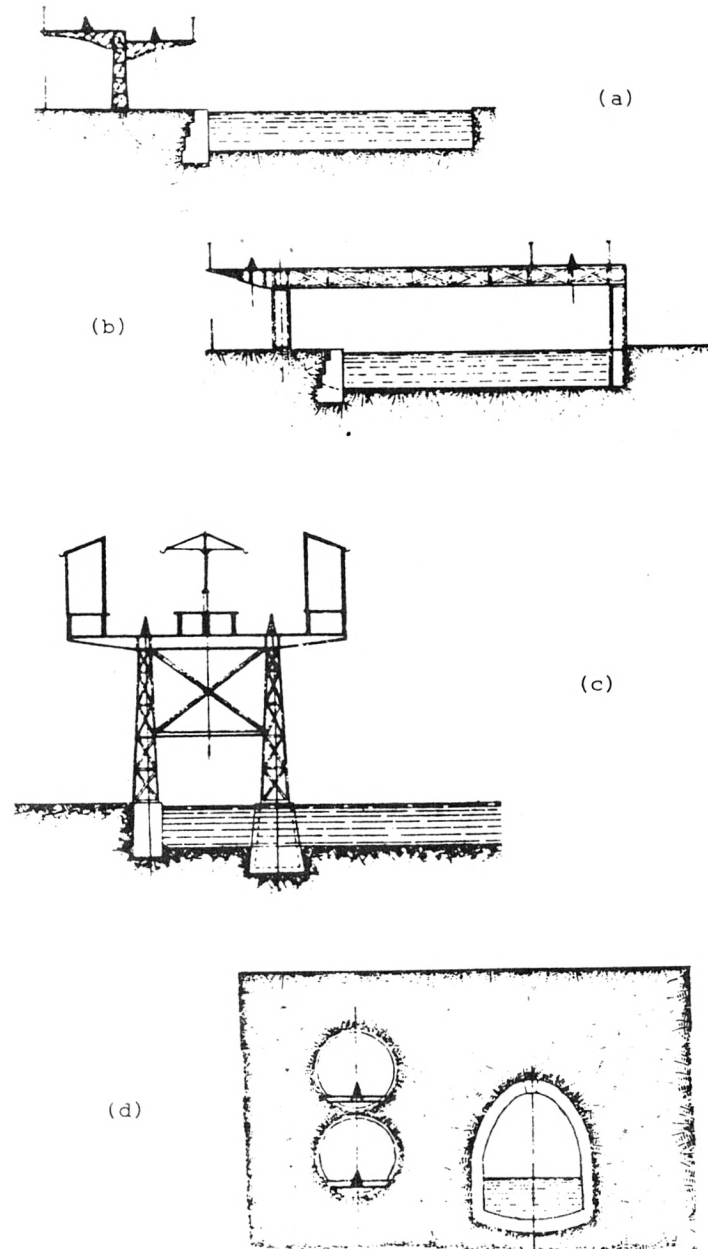


Fig. 2. Transverse cross-sections at various places

The eastern branch through Mile End would follow the Regent's Canal, but the branch to Broad Street would run above the North London Railway. A detailed design for the junction at Kingsland Road, including all the proposed gradients, was given in the proposal put before the Royal Commission.

The two main tunnel sections were the canal tunnels under Aberdeen Place in Maida Vale (272 yd) and from Muriel Street to Colebrooke Row in Islington (960 yd).⁵ Behr gave the total length of tunnel as 1,530 yards, so the remaining 300 yards (approximately) must have been made up by road crossings where an existing bridge could not be utilised.

The central electricity generating station for the whole system was to be near Parnell Road in Old Ford. The length of the 'main line' from Royal Oak to Victoria Dock was 12 miles 1 furlong, and the three branches totalled 5 miles 5.8 furlongs, giving a total length of double-track railway of about 17.8 miles. Of the 24.25 miles of single track on the main line, 15.7 miles were to be level. The Up and Down tracks did not run together over all the route, and the Down track had 0.58 mile more level than the Up track. Only 17% of the single-track mileage was on an up-gradient, and only 28% was curved.

A description of the monorail line proposed by Behr having been given, it is now necessary to attempt some assessment of it and its prospects had it been built. Technically, the proposal seems sound enough. The Lartigue monorail principle had been operating on a commercial railway – the Listowel & Ballybunion – since 1888, and, indeed, continued to function and give service until 1924. Behr, as managing director of this railway company until its bankruptcy in 1897, had had a great deal of experience of the operating and technical features of this low-speed, steam-worked line. Then Behr had also, by the time he presented the NM&RC proposal to the Royal Commission, had not only the experience of designing the Lightning Express electric monorail intended to run between Manchester and Liverpool, but had also carried out extensive experiments on a full-scale three-mile demonstration track at Tervueren in Belgium in 1897–8.⁶ This line was electrically operated, the train was a single car seating 100 passengers in great comfort and weighing 55 tons. Speeds of 70–80 mph were reached with apparent safety. Thus Behr was very well qualified to design and construct the NM&RC monorail line; he was, moreover, also well qualified to estimate costs of construction and operation. He was much less well qualified to estimate likely traffic.

As a commercial proposition, the NM&RC line was not so obviously sound. It was a purely passenger line, leaving goods traffic to the canals. It ran over a route which kept quite close to the existing North London Railway line, and would in many parts be competing with it for passengers. The NLR passenger traffic and receipts were in 1900–05 still more-or-less at their all-time peak,⁷ and as their subsequent decline would not have been anticipated by Behr and his contemporaries, they would probably have thought that there was plenty of potential traffic for both lines. Figures obtained by the Royal Commission, for 1903, (Vol. 1, p. 64) show the NLR's Broad Street terminus as the third busiest of London terminals (behind Liverpool Street and Waterloo), and more significantly, Mr E. Harper's evidence in Table 39 of Appendix 6 of Vol. 3 shows Broad Street heading the list of terminals with overcrowded trains; on the morning inward rush, 32 trains were overcrowded to an average extent of 21.6% and a maximum extent of 65.2%. There was apparently not only scope, but a real need for relief.

Behr estimated 40 million passenger journeys a year for his line, with an average fare of 2d, giving total annual receipts of £341,000. This estimate is very close to the actual figures for the NLR. We can see now that there was little likelihood of the NM&RC line actually attaining such a traffic had it been built. Being a sort of orbital line, it did not have the potential for expansion into the countryside and the creation of traffic from greenfield development which the radial railways – including the expanding tube routes – possessed and exploited. Although, compared with the NLR at that time, it would have had the advantage of electric traction and low costs of construction, it would have had the very serious disadvantage of the impossibility of through running over other lines. Nevertheless, one cannot help regretting that such an interesting line was not built. As far as is known, no company was formed to promote it, and no Act was sought.

Behr was not the first to propose a railway along the canal route he had chosen. The Regent's Canal had been transferred in 1882–3 to a new statutory company, the Regent's Canal, City, & Docks Railway Company, which had obtained an Act of the same name in August 1882. This Act provided for the construction of a railway from the GWR near Royal Oak, along the Regent's Canal, the Hertford Canal, and the Northern Outfall Sewer to the Docks, leaving the canals still functioning. At the western end the railway was to be largely in subway, and at the eastern end on a viaduct. There was also to be a City branch, to the Barbican, but under an Act of 1883 this was to constitute a separate entity.⁸ The cost of the railway was going to be about £6 million. It was not built. Behr made quite a point of the fact that his monorail would cost only about £1.2 million; nevertheless, it seemed to make no impact on the Royal Commission.

REFERENCES

- 1 D. G. Tucker, 'The Listowel & Ballybunion Railway. Some revisions and additions to its story', *Journal of the Railway and Canal Historical Society*, Vol. XXVIII No. 1, 1984, pp. 2–13
- 2 D. G. Tucker, 'F. B. Behr's Development of the Lartigue Monorail: from Country Crawler to Electric Express', *Transactions of the Newcomen Society*, Vol. 55, 1983–4, pp. 131–52
- 3 Although Behr carelessly says it was, when being interviewed by the Royal Commission (Vol. 2, minute of evidence No. 18281), and this was repeated by J. R. Day and B. G. Wilson in their otherwise excellent short account in *Unusual Railways*, Müller, London, 1957, pp. 169–70
- 4 As ref. 1, Appendix 2
- 5 Tunnel lengths as given by E. W. Paget-Tomlinson, *Canal and River Navigations*, Waine Research, Albrighton, 1978, p. 206
- 6 As ref. 2
- 7 H. P. White, *Regional History of the Railways of Great Britain, Vol. 3, Greater London*, Phoenix, London, 1963, p. 79
- 8 *Regent's Canal, City, & Docks Railway (Various Powers) Act, 1883*. An interesting point about the names of the 1882 and 1883 Acts is that Behr refers to the company as the North Metropolitan Railway & Canal Co. and Day and Wilson repeat this. But it must be wrong; the NMR&C Company is not mentioned in either Act, and Paget-Tomlinson quotes the RCC&DR Company.