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John Cordy Jeaffreson

Excerpt

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THE LIFE

OF

ROBERT STEPHENSON.



CHAPTER I.

THE BATTLE OF THE GAUGES.

(ÆTAT. 40-42.)

Great Western Railway in 1833 — Brunel's Scheme for a Broad Gauge — History of the Narrow Gauge — Advantages anticipated by Brunel from a Broad Gauge — Brunel's Report of 1838 — Theory of Railway Districts — Break of Gauge first takes place at Gloucester in 1844 — Goods Traffic, not Passengers, the grand Cause of Difficulty at 'Breaks of Gauge' — Gauge Pamphleteers — The Oxford and Wolverhampton Contest in 1845 — Lord Dalhousie's and Mr. Cobden's Motions — Royal Gauge Commission appointed — Brunel's Inconsistencies — The Railway Clearing House, instituted under the Auspices of Mr. Glyn and Mr. Hudson — Its leading Principles and its Returns for 1845 — Witnesses examined by the Gauge Commissioners — Brunel left alone — Robert Stephenson's Character as a Parliamentary Witness — His Evidence before the Gauge Commission — Brunel's Expedients for obviating the Evils of 'Break of Gauge' — The Commissioners' Report — The last Argument in favour of Competition advanced by the Broad Gauge Party and answered by Mr. Thornton Hunt — Illustrated Evidence — The Gauge Act — Robert Stephenson's Report on Double Gauges.

WHILST Robert Stephenson was proving that the locomotive was superior to atmospheric propulsion in economy and adaptability of power, he was

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involved in another controversy, of not less importance, which brought him again in collision with the brilliant engineer, who was throughout life his constant professional opponent, and warm private friend. The relations that subsisted between him and Brunel could not have endured between rivals endowed with merely ordinary generosity. Continually as they were pitted against each other, much as the reputation of the one was exalted by the failures of the other, they not only preserved strong mutual affection, but in their gravest periods of public trial were always ready to assist each other with counsel and support. When Robert Stephenson with fearful anxiety was watching the floating of his first enormous tubular bridge to the piers, Brunel stood by his side; and when Brunel was heroically contending with the gigantic difficulties of launching the Great Eastern, Robert Stephenson disregarded the claims of failing health, in order that he might be on the spot to encourage and advise his brother engineer. Two nobler adversaries the world never witnessed.

Whilst ordinary men were admiring the phenomena of railway development, Brunel was criticising George Stephenson's system and planning improvements. It struck him that iron roads were not all they might be, or ought to be; and it was not long before he struck out a novel method for their construction. At the first projection of the Great Western Railway in 1833, it was contemplated that that line and the London and Birmingham Railway should have a common terminus in the metropolis. The combined opposition of the Eton and Oxford authorities threw out the Great Western Bill in its first parliamentary campaign, and before the renewal of the contest, Brunel,

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THE NARROW GAUGE.

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as engineer of the line, proposed to some of the directors that their gauge, or distance between the rails, should be 7 feet instead of 4 feet $8\frac{1}{2}$ inches. This suggestion was submitted to Robert Stephenson, and was by him promptly rejected. Under ordinary circumstances there would have been an end of the novel scheme; but Brunel was gifted with no ordinary powers of persuasion, and the directors of the Great Western were induced by him to separate themselves from the London and Birmingham Company, and make their line according to his wishes.

As the reader is well aware, the gauge of George Stephenson's first public railway was 4 feet $8\frac{1}{2}$ inches, which had been the gauge of the colliery tramways of Northumbria from the time of their first construction. In the Life of Lord Keeper North, A.D. 1676, it is recorded —

The manner of the carriage is by laying rails of timber from the colliery to the river, exactly straight and parallel; and bulky carts are made with four rollers fitting those rails, whereby the carriage is so easy that one horse will draw down four or five chaldrons of coals, and is an immense benefit to the coal merchant.

Made to be drawn by horses, these wagons differed little from the carts previously used, the innovation consisting only in finding for them smooth wooden ways, and wheels adapted to those ways. When the wooden trams were first cased with metal, and later on the introduction of iron rails, the same width was continued. The introduction of the locomotive brought with it no new conditions inviting men to change the usage of the country; and George Stephenson therefore made his

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lines in accordance with the ancient custom. This 4 feet $8\frac{1}{2}$ inches was the original tramroad gauge.

Other gauges were in existence. In some of the mineral districts of England, where the tramways have to meander down hills and into positive gullies, a gauge of two feet had been adopted. In such a country, and for the carriage of minerals, a very broad gauge was clearly not to be thought of. But for comparatively open and level regions no objection to the introduction of greater width between the rails presented itself, to counterbalance the advantages hoped for from the change. Those advantages Brunel expected to find in greater speed, ease of motion, and economy of working. With the wider way, the engineer contemplated the use of larger carriages and more powerful engines. From his engines fitted with wheels ten feet high he looked for a vast increase of speed; and he hoped to effect greater safety by placing his passenger-carriages between instead of over the wheels. According to his calculation one grand advantage of the wide gauge would be diminution of oscillation at high speeds.

The most obvious objection to a wider gauge, at that period of railway history, was the increase it would necessarily effect in the expenses of constructing a line—especially where tunnels, earth-works, and viaducts were frequently needed. The next point for criticism to fix upon was the inconvenience that would ensue to the public wherever lines with different gauges ran into each other. These two difficulties Brunel handled with characteristic adroitness, treating the former as of little weight with regard to the works he contemplated, and finding in the latter an argument actually in favour of his scheme.

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BRUNEL'S FIRST POSITION.

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Making the most of his theory that each district of the country should have the gauge most adapted to its geographical features, he reminded his opponents that it was no part of his plan to do away with the two, three, and four feet gauges of mineral districts, or to oppose the 4 feet 8½ gauge in countries where that width had already been used or was likely to be most serviceable, but only to introduce his wide gauge in regions, comparatively open, sparsely populated, and untried by railway engineers. London and Bristol, he argued, were separated by a sweep of country offering (except at two or three points) comparatively few obstacles to the maker of iron roads. The difference of cost, therefore, between a wide road and a narrow road would be slight—at least slight compared with the advantages of a system which would convey with unexampled rapidity an entire army of passengers from the metropolis to the capital of the West, in a single train. So cleverly was the objection of expense thus put aside, that shareholders were almost ashamed of their folly in raising the question. The next point—the inconvenience, namely, of ‘break of gauge,’ as it was soon called—Brunel treated in a very different way. It was true the inconvenience of a break of gauge would be grave, if it occurred; but then he maintained it never would occur.

In his report of 1838 to the directors of the Great Western, he said:—

I shall now consider the subject of the width of gauge. The question of the disadvantage of differing in point of gauge from other railways, and the consequent exclusion from communication with them, is the first. This is undoubtedly an inconvenience; it amounts to a prohibition to almost any railway

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running northwards from London, as they must all more or less depend for their supply upon other lines or districts where railways already exist, and with which they most hope to be connected. In such cases there is no alternative.

The Great Western Railway, however, broke ground in an entirely new district, in which railways were unknown. At present it commands this district, and has already sent forth branches which embrace nearly all that can belong to it.

Such is the position of the Great Western Railway. It could have no connection with any other of the main lines, and the principal branches likely to be made were well considered, and almost formed part of the original plan, nor can these be dependent upon any other existing lines for the traffic which they will bring to the main trunk.

Such was Brunel's language in the early stages of the gauge controversy, and such it had been when he prevailed on the directors of the Great Western to adopt his innovation.* Briefly stated, his argument was this:—

* Mr. Brunel's evidence before Gauge Commissioners, Oct. 25, 1845, gives the particulars of the origin and growth of his preference for the Broad Gauge.

'You are the engineer of the Great Western Railway?—I am.

'Was the line surveyed under your direction?—Yes.

'And you decided on its course?—Yes.

'In what year was that?—In 1833.

'That was three or four years subsequently to the formation of the Manchester and Liverpool Railway?—Yes.

'Had you, before you took the direction of the Great Western Railway, any employment in railway matters?—No.

'That was the first line upon which you were engaged as an

engineer?—Yes, the first line upon which I was engaged which was constructed; I had looked over other lines of country.

'With a view to railways?—Yes.

'At what period did it occur to you to change the gauge from 4 feet 8½ inches to 7 feet?—I think, in my own mind, it occurred to me in the course of my surveys in 1833 and 1834.

'That a change of gauge would be desirable?—Yes.

'But the exact amount of the change you had not then decided upon?—I think not, and I think I never mentioned it to anyone.

'Will you favour the Commissioners with the reasons which induced you to think that 4 feet 8½ inches was insufficient at that early period?—*Looking to the speeds which*

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BRUNEL'S ARGUMENT.

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The west country at present has no railways, it lies open to our enterprise. Let us seize the opportunity, and drive a grand trunk line with a few important branches through it, making our gauge such that no line of the old gauge can run into our roads and suck our traffic. By adopting this course we shall have a monopoly of the west country.

At first Brunel met with little encouragement from the directors. They were not alarmed at the novel proposals, nor did they condemn them as chimerical, but commercial caution made them apprehensive that they might sink in public estimation if they declared themselves the leaders of a revolutionary movement. Brunel's suggestion, however, of a monopoly of the west country, from the impossibility of narrow gauge lines acting harmoniously

I contemplated would be adopted on railways, and the masses to be moved, it seemed to me that the whole machine was too small for the work to be done, and that it required that the parts should be on a scale more commensurate with the mass and the velocity to be attained.

'The trains at that period were comparatively light to what they are now, both in goods and passengers? — Yes.

'You had probably travelled a good deal upon other railways, and had seen much of other railways that then existed? — Yes, as much as I possibly could. I think the impression grew upon me gradually, so that it is difficult to fix the time when I first thought a wide gauge desirable; but I dare say there were stages between wishing that it could be so, and determining to try and do it, and I cannot at this moment distinctly remember the time.

'Do you recollect at what period you determined upon submitting the 7 feet gauge to the directors of your company? — It must have been almost immediately after the passing of the Act, which was in 1835, and I think I must have mentioned it to the directors long prior to that, because I made great efforts to get the clause omitted which fixed the gauge, and I communicated certainly with Lord Shaftesbury early in 1835.

'Therefore the omission of that clause, which was a very proper omission perhaps, was the result of your communication? — It had been omitted, fortunately perhaps for me, in one Bill previously. I think that the Commissioners will find that in the first Southampton Railway Act it was omitted. It was omitted in the first Great Western Bill, and there I must have taken steps with reference to the gauge early in 1835.'

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with broad gauge lines, sunk deep in the minds of the projectors, and bore fruit.

There is no ground for thinking that Brunel acted disingenuously towards his directors. He saw in railways only the future channels of communication between important centres of manufacture and commerce—not the means of passage between petty market towns and secluded hamlets. Each range of country would have its grand trunk, with its limited number of branches to cathedral towns and harbours; but it was not on the list of chances that the branches of these gigantic arteries would multiply, extend, and cross each other—that the surface of the island would be one patch of network. Holding this view (which was the view almost universal in 1833), Brunel gave his directors honest counsel.

He gained his object. The bill was obtained, and the line was made in accordance with his wishes. It was true that its construction was attended with costly accidents and vain experiments. The engines with the huge wheels turned out failures, in consequence of their being deficient in boiler power; but at length the railroad began its career with dazzling *éclat*. The Great Western was the topic of ‘the season.’ Everyone was in raptures with the smoothness of its way, the height of its speeds, and the luxury of its first-class carriages. As far as the drawing-rooms of May Fair were concerned, the success of the broad gauge was established. Many a humble family has cause to lament that experience, and vulgar calculations of pounds, shillings, and pence have signally falsified this flattering verdict.

A few years gave the public an opportunity of judging how far the theory of distinct fields of railways, not

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'BREAK OF GAUGE.'

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running into each other, was likely to be realised in practice. The plans of projectors soon indicated that iron roads would refuse to run to the capital without inter-communication, and the year 1844 saw the Western and Midland counties in actual collision. The extension of the line between Birmingham and Gloucester, uniting the latter town with Bristol, had, in order that it might accord with the line of which it was a continuation, been planned on the narrow gauge. The directors of the Great Western, seeing in this narrow gauge extension, known as the Bristol and Gloucester, an alarming irruption into their broad gauge field, contrived by a stroke of finance to gain control over its company. Their control was of course exercised to convert the proposed narrow gauge into an actual broad gauge. The result was that on the opening of the extension in 1844, the two scales of roadway met, and Gloucester had the honour of being the scene of the first 'break of gauge.' At first 'the break' attracted but little attention beyond engineering circles. The public were not sufficiently familiar with railways to be highly critical. If passengers from Birmingham to Bristol had to get out of narrow gauge carriages at Gloucester, and crossing over a platform with their baggage, had to seek fresh places in the broad gauge extension, the trouble was trifling compared with that of the shiftings from stage-coach to stage-coach to which travellers had been accustomed. When 'the battle of the gauges was at its height,' pamphleteers were pathetic on the sufferings of delicate ladies and young children, compelled to 'change places,' and pass through the raw night air on their way from one gauge to the other.

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Had passengers only been affected by ‘break of gauge,’ little attention would have been paid to their discomfort and complaints; for the hardship is slight which an ordinary traveller sustains in changing his carriage once in half a hundred miles. The real inconvenience of ‘a break of gauge’ was found in the conveyance of goods.

Railway communication had not existed many weeks between Birmingham and Bristol, before the manufacturers of Birmingham and the railway officials at Gloucester knew what was the real difficulty. The heavy goods, sent from Birmingham for shipment at Bristol, had to be shifted from gauge to gauge by the Gloucester porters. Packages were misplaced, delayed, or missent. Complaints daily increased; and ‘Birmingham men’ learnt the discomfort of having a break of gauge between themselves and the Bristol Channel. In due course a comparison of the goods traffic on the Grand Junction, the London and Birmingham, and the Midland lines, with that on the route between Birmingham and Bristol, gave a triumph to the opponents of the broad gauge.

‘Break of gauge’ was no longer a matter of speculation, but an evil in actual existence. The agitation it aroused soon attracted the attention of the legislature. In the session of 1845, the London and Birmingham and Great Western Companies were in the field with rival bills for a line of railway between Oxford and Wolverhampton. The manifest evils of ‘break of gauge’ induced the railway department of the Board of Trade to decide against the pretensions of the Great Western. The House of Commons, however, set aside the decision of the Board of