CHAPTER 4

THE AFTERMATH OF GRAVATT'S DISMISSAL

Brunel had to quickly reorganise the engineering staff and mount a damage-limitation exercise. Three of the six contracts between Bridgwater and Taunton were started before or during June and another two during July 1841. By the end of July John England was being referred to as 'the Resident Engineer' for the stretch between Bridgwater and Taunton, but whatever their formal title may have been England, Froude and Peniston were now working directly under Brunel.[1] All that is known with certainty about their precise geographical and supervisory limits of operation during the rest of 1841 is that Froude arrived in Cullompton on 25 November 1841 'with instructions to commence operations on this district.'[2]

Gravatt's next opportunity to discredit Brunel came at the General Meeting on 2 September 1841. The following summary of salient points has been compiled from reports in three local newspapers.[3] Following the presentation of the Board's self-congratulatory and optimistic report the shareholders questioned Brunel at length on several issues. The main issue concerned the reasons for the difference between the original estimated costs of the contracts for constructing the line to Bridgwater (£210,000) and the total contract payments (£430,000). This disparity was the major factor in the difference between the £35 per share originally stated to be necessary and the £60 per share that was evidently now required. Brunel gave as the chief reasons the increased costs resulting from the decision to reduce the gradients at Ashton and the necessity to flatten some side-slopes, and the high rates tendered by the contractors

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[1] Anon to George Cooke, 31 Jul 1841: BRO 12167/34, B&ER Solicitors' Letter Book. All three assistants later referred to themselves as having been Resident Engineers from the time of their first engagement on the B&ER: ICE undesignated, membership records. Clearly, the title 'Resident Engineer' was being applied somewhat arbitrarily.

[2] William Froude to Brunel, 26 Nov 1841, copy made 27 Nov 1841: BUL DM 1306.VIII.22. By that time the line was being set out between Taunton and Whiteball: that month the GWC Cos.' Clerk wrote to the GWC Superintendent:

> The Rail Road Engineers are going on fast with their Work in taking levels – on the Westernside or North Side from Taunton to Trefusis - & thence on the Southernside to White Ball Hill – 6 Waggon Loads of Excavating Tools are brought to near White Ball:

James Partridge to John Twisden, 13 Nov 1841: CKS U49/C9/8/2, Twisden MSS. I am grateful to Denis Dodd for drawing my attention to this reference.

[3] Bristol Mercury 4 Sep 1841; Bristol Mirror 4 Sep 1841; Felix Farley's Bristol Journal 4 Sep 1841. The reports broadly agree on the general course of the meeting but differ significantly in the amount of detail and in their reporters' grasp of the issues.

because of the rise in wages due to the amount of construction work underway at that time. He also conceded that he was responsible for the problems arising from some of the 'Levels' bridges having settled and subsequently been rebuilt:

> The bridges stood for a long time, even with the weight of the embankments, but ultimately they sunk. Before building them it was ascertained that there was a certain thickness of clay, and under that a certain quantity of peat. Considering that the clay would bear the bridges, they were built upon it, but the weight of the embankments caused it to sink.

He also took responsibility for some bridges having been built a foot lower than the standard height. He refused to disclose his estimated costs of the outstanding contracts, saying that if he estimated £2,000,000 the public would say, 'Your engineer says two, and the cost therefore will be three millions.' He would only say that in his opinion they would be executed at lower rates than those for the current contracts, 'but circumstances may arise which would defeat that expectation.' In support of Brunel's reticence Fripp remarked that contracts were frequently let before the design was completed: 'Culverts and things of that kind, it was impossible to include in the first estimate.' Fripp also dismissed a derogatory comment from the floor that the Directors were 'frequently too much under the control of the engineers':

> He had seen repeated instances where the engineer had not followed up his own judgement in consequence of the contrary opinion held by the directors.

Regarding the origins of the estimate of £35 per share, Felix Farley's Bristol Journal reported a shareholder saying, 'If Mr. Fripp would be at the pains of making a little inquiry he would have no difficulty in finding who were the authors of that report,' at which Edward Divett, MP for Exeter, remarked, 'De mortuis nil nisi bonum.' Gravatt later interpreted this as an insensitive reference to the late deputy chairman, Samuel Waring.

Before the motion for adopting the Directors' report could be put Gravatt claimed a right as a shareholder to raise questions about Brunel's explanations; the resulting altercation lasted over two hours. He first queried whether Brunel's statement that he (Brunel) alone was responsible for the bridges being built too low coincided with the allegation that Gravatt had built the bridges low without telling him, made in his letter of 18 June 1841. Gravatt also quoted a phrase from Brunel's letter of 15 June 1841: 'If you resign without raising a question as to the cause you may depend upon my silence,' which he said implied that he (Gravatt) had acted improperly. As a result, his reputation

had been seriously damaged. Brunel responded that he made no charge against Gravatt, and asked him to read out the whole of his letter of 15 June. Gravatt did so and continued his denunciation of Brunel amid competing calls from the floor: some felt it was purely a personal matter and ought not to be heard, others that Gravatt was entitled to a fair hearing. Brunel said that it was proper that he himself should leave the room while his own conduct was discussed; 'Mr. Brunel then put on his hat and left the meeting.'

Ricketts interrupted Gravatt's resumed address and put the motion for adopting the Directors' report, which was then carried. Gravatt then seconded a motion of no confidence in Brunel and went on to make charges of misconduct against Brunel, whom he accused of neglecting his duties, wilfully misleading the Directors, drawing them into unnecessary expenditure and making 'fallacious' estimates on which Waring had based his statements. Unfortunately the newspaper reports do not detail the charges. He concluded his long address by saying that the quarrel between himself and Brunel originated in his urging Brunel to make correct estimates, and that his dismissal would not have occurred if the GWR had not now been completed, 'Mr. Brunel now possessing time to attend to the Bristol and Exeter.' Gravatt's allegations provoked another long and noisy wrangle among the shareholders which Charles Saunders, the GWR Secretary, brought to a close by moving an amendment to the effect that Brunel enjoyed the undiminished confidence of the shareholders, and was entitled to their warmest thanks for his professional zeal, integrity and skill. The amendment was carried, 'amidst loud cheering,' with only three dissentients. Oddly, it appears that this extraordinary instance of one salaried officer putting a motion of confidence in favour of another salaried officer was not remarked upon.

Gravatt's final attempt to denounce Brunel and, by association, Fripp was to circulate a printed letter to the B&ER shareholders soon after the meeting because, he said, he had not had a fair hearing.[1] He began by reviewing the statements relating to the estimated costs, predicted traffic figures and anticipated opening dates as recorded in the Directors' reports to General Meetings. He noted that the Directors had stated that the cost of opening the line to Bridgwater would not exceed £35 per share on the basis of Brunel's estimates, right up until the General Meeting in September 1840. Fripp had impugned the traffic figures at that meeting and had said, 'The Directors did not know, the Board could not find out, how they had obtained that estimate of £35 per share.'

[1] Gravatt W., Letter (1841).

Gravatt said that both Fripp and Badham had more than implied that Waring made the estimate of £35 a share against Brunel's consent and opinion:

> … putting the whole into a form calculated to induce persons to embark their money in the Railway ... The fact is, that Mr Fripp's assertion is altogether false and calumnious, and injurious to the Company; and I firmly believe it was made without the sanction of his brother Directors.

Gravatt then set out his counter-responses to the issues raised by Brunel's answers to questions at the General Meeting on 2 September 1841, claiming:

> As I chose the Line myself, and have thoroughly re-examined it, and have had it re-surveyed, and re-levelled, and have at least roughly set out the whole distance from Bridgewater to Exeter, I can speak with a knowledge of my subject, far greater than any body else can pretend to.

He affirmed, quite correctly, that not only had none of the gradients at Ashton been reduced but that some had in fact been doubled after the major part of the excavation was completed. Some side slopes had been flattened because Brunel had over-estimated the slope-stability of the soil before letting the contracts; fortunately, Gravatt had had the foresight to acquire sufficient land to accommodate the flatter side-slopes. Contractors may well have been at a premium when the contracts were let, but Brunel had recommended that the Directors should pay them, in some instances, 40% more than the high rates they had contracted for. Though it might be true that people would exaggerate the estimated costs beyond Bridgwater, it was still Brunel's duty to give an estimate.

Gravatt next took a swipe at Fripp who:

> … follows with a positiveness of manner and coolness of delivery calculated to convince every body that he was thoroughly acquainted with his subject, and could check and control an engineer quite as easily as he could eat a gooseberry; and he, with some important additions, tells us the same story that Mr Brunel does.

In response to Fripp's remark that it was impossible to include culverts and the like in the estimates, Gravatt stated:

> Why – I drew up the contracts, and designed all the bridges and culverts, and 'things of that kind,' on the Bristol and Exeter Railway, as I had before done on the greater part of the Great Western, and I fixed the number and the situation of them, and saw to their execution; and I distinctly affirm that each and every contract included more culverts and bridges, and 'things of that kind,' than were ever built, and that I saved them; and that by contriving the peculiar sort of bridges, now known by the name of Flying Bridges, I very materially reduced (in some cases I halved) the quantity of masonry throughout the Line.

He said that, as a substantial shareholder with £5,000 invested in the B&ER, he could not sit quiet while Brunel and Fripp made statements so at variance with the facts. Without wishing to be alarmist, he warned the shareholders that the most expensive part of the work was yet to come, and told them he felt that, after what they had seen of Brunel's 'estimates, opinions, and assertions' on the B&ER, as well as elsewhere:

> … we cannot place confidence in him, and that we should not be acting fairly to ourselves, if we allowed such things to pass without observation.

Later that month Gravatt refused to comply with Badham's request that he should return all 'Plans, Drawings, Instruments, Books, Letters, Accounts & all other property belonging to this Company.' The Board threatened legal action, at which point Gravatt returned a few documents but positively refused to return the letters Brunel had written to him.[1] Brunel wrote to Badham in October:

> I have now given you & the Directors a stimulous *[sic]* to get my letters – it will be very good fun to see what I said of you when I was writing as I thought to a confidential friend – never mind – the letters I must have by any means except the taking him before the magistrates & if a little truth leaks out it may do you all good.[2]

The letters were considered to be particularly important in case of legal proceedings with any of the contractors for the works who were referred to in the letters, 'which in the case of Mr. Hemming appeared exceedingly probable.' The solicitors were instructed to take counsel's opinion, of which the outcome is not known.[3]

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[1] TNA/PRO RAIL 75/5, Board Minutes, 3, 17 Sep 1841. On 7 September 1841 Brunel made a rough list of 'Things not now in office':

> Letters from Contractors were formerly all in Mr. L [?Layard] custody – have been removed without asking.
> Copies of Mr. G letters to contractors – do. do.
> Original drawings of works before revision & alterations.
> Original level books & field books of surveys with data for floods waterways.
> My letter to Mr. Gravatt.
> General letters on the business of the Compy with land owners tradesmen & others:

BUL DM 1758/2, Brunel's Notebook, 7 Sep 1841.

[2] Brunel to Badham, 19 Oct 1841: BUL PLB 2a.

[3] TNA/PRO RAIL 75/64, Works Committee Minutes, 26 Nov 1841; TNA/PRO RAIL 75/7, Board Minutes, 26 Nov 1841, 4 Feb 1842. Gravatt had still not returned any papers relating to Sanford's bridge at Nynehead by early February 1842, when he told Badham:

> … he did not know where to look for the Drawings & Documents relating to Mr. Sanford's Bridge, & that he was going out & could not then look for them:

TNA/PRO RAIL 75/7, Board Minutes , 11 Feb 1842.

By the end of 1843 Fripp had reported that twelve 'Levels' bridges had collapsed or had settled to the extent that their replacement was inevitable. Another ten bridges had been replaced for which Fripp gave no reason – it is possible some failed structurally and others were taken down because they were too low (see Table 3.2). All were rebuilt with timber decks on masonry abutments.[1] In October 1842 the Taunton Courier reported what appears to have been the locally-accepted version of events and the cause of them:

> It is regretful to see removed most of those beautiful stone arched bridges on the line of railway between Bristol and Bridgwater, and replaced by those of wood, which are flat, and have an unsightly appearance. It has, however, become necessary, in consequence of their being so low that sufficient room was not allowed for the chimneys of the engines to pass through. The bridge at Highbridge, over the old Bristol road, was blown up with gunpowder last week, and the whole of it removed in the short space of six or eight hours.[2]

Only three 'Levels' bridges between Bristol and Taunton were spared – Chelvey and Kenn Moor Lane bridges on the edge of Kenn Moor, and Bath Road bridge in Bridgwater – and all three are still extant.

Exeter Bridge was repaired at the end of 1842 when it appeared that settlement had ceased, and the centering was finally removed in March 1843; in fact, the arch continued to settle for many years after that.[3] In May 1842 Brunel eased the centering

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[1] TNA/PRO RAIL 75/159, Fripp's reports, passim; TNA/PRO RAIL 75/160, Fripp's reports, passim.

[2] Taunton Courier 5 Oct 1842. Gravatt later gave an evasive and misleading answer when he was questioned about his responsibility for the problems arising with the B&ER bridges:

> *Q:* Do you mean that there were not certain bridges obliged to be altered by Mr. Brunel that were constructed by you?
> *Gravatt:* No – there was a bridge at Highbridge that we could make no arrangement with the Navigation about the height of crossing – the line was a long time delayed – at length the line was pressed forward in a hurry – the Navigation saw their fault and allowed us to make the rails differently – consequently the Highbridge bridge had to be altered very suddenly. I put a barrel of powder under the bridge and lifted it out of the way and that made a great noise in the country:

TPA HC/CL/PB/2/11/31, evidence taken before the Commons Select Committee on the Direct Northern Railway Bill, William Gravatt, 8 Jul 1845, pp.244-246. Gravatt seems to be referring here to the demolition of the bridge carrying the line over the Glastonbury Canal at Highbridge, to which no other reference has been found.

[3] TNA/PRO RAIL 75/160, Fripp's reports, 3 Nov, 8 Dec 1842, 9 Feb, 9 Mar 1843. Robert Brereton wrote of this bridge:

> The arch had settled in the first ten years 21 inches, including the allowance originally intended, and in the next ten years a further 11

under Somerset Bridge so that it was still beneath the arch but not supporting it. By early June the permanent way was being laid over the bridge 'in timber troughs filled with sawdust supported on longitudinal walls of brick, over which ballast is spread' in an attempt to reduce vibrations, in time for the opening of the line to Taunton on 1 July.[1] Tragedy struck on 3 September 1842 when a boat sank after drifting against the centering, and John Hopkins, an 11 year-old boat-boy, was drowned. A verdict of 'accidentally drowned' was returned and the jury expressed their:

> ... disapprobation with the B&ER, for leaving the centre so long after the building is erected, to the great danger of the navigation and the lives of her Majesty's subjects.

Despite this censure Brunel kept the centering in place, prompting rumours that the bridge was unsafe.[2] In February 1843 two more barges were driven by the tide against the centering and sank; thankfully the crews were saved.[3] Just five months later two youths were less fortunate when their boat struck a timber fender attached to the centering, capsized and sank; 15 year-old Joseph Hall and 18 year-old Richard Hall were drowned. The jury returned a verdict of manslaughter against all thirteen Directors of the B&ER who immediately directed Brunel to remove the centering. According to Brunel:

> Although the arch itself is still perfect, the movement of the foundations has continued, although almost imperceptibly, except by measurements taken at long intervals of time; and the centres have in consequence, been kept in place. Under existing circumstances, it is sufficient that I should state, that, in compliance with a resolution of the Directors, measures are being adopted to enable us to remove these centres immediately, at the sacrifice of the present arch.[4]

> inches, being 32 inches in all ... the ballast at the crown having accumulated to more than double:

Brereton R.P., in discussion of: Gaudard J., 'On the Theory and Details of Construction of Metal and Timber Arches' Minutes Proceedings Institution Civil Engineers Vol.31 (1871), pp.158-159. Writing in 1935 when the bridge was demolished Shackle noted, 'It appears from dimensions on the original drawings that it had settled down at the centre about two feet,' but that no movement had been noted for as long as records had been kept: Shackle C.E., 'Interesting Bridgework on the Bristol (Temple Meads) Improvement Scheme' Great Western Railway Magazine (1935), p.643.

[1] TNA/PRO RAIL 75/159, Fripp's report, 14 Apr, 12 May, 9 Jun 1842.

[2] Somerset County Gazette 17 Sep 1842. The Taunton Courier claimed, without quoting a source, that the bridge required removal, 'but from the great obstruction at high water, the operations are necessarily suspended': Taunton Courier 12 Oct 1842.

[3] Somerset County Gazette 25 Feb 1843.

[4] TNA/PRO RAIL 75/9, Board Minutes, 11 Aug 1843; Somerset County Gazette 12,26 Aug 1843; Taunton Courier 16,23 Aug 1843. Eventually, on 31 January 1844 the proceedings arising out of the coroner's inquisition of manslaughter were quashed in the

A replacement timber bridge was installed on the existing abutments and was operational by February 1844.[1]

Court of Queen's Bench, 'thus putting an end to all future proceedings': Somerset County Gazette 10 Feb 1844.

[1] TNA/PRO RAIL 75/160, Fripp's reports, 10 Nov 1843, 4 Jan, 1 Feb 1844. Brereton described the timber bridge as:

> ... a system of double polygons, placed one within the other, bolted together and breaking joint, by which means great stiffness had been obtained:

Brereton R.P., in discussion of: Gaudard J., 'On the Theory and Details of Construction of Metal and Timber Arches' Minutes Proceedings Institution Civil Engineers Vol.31 (1871), p.160.