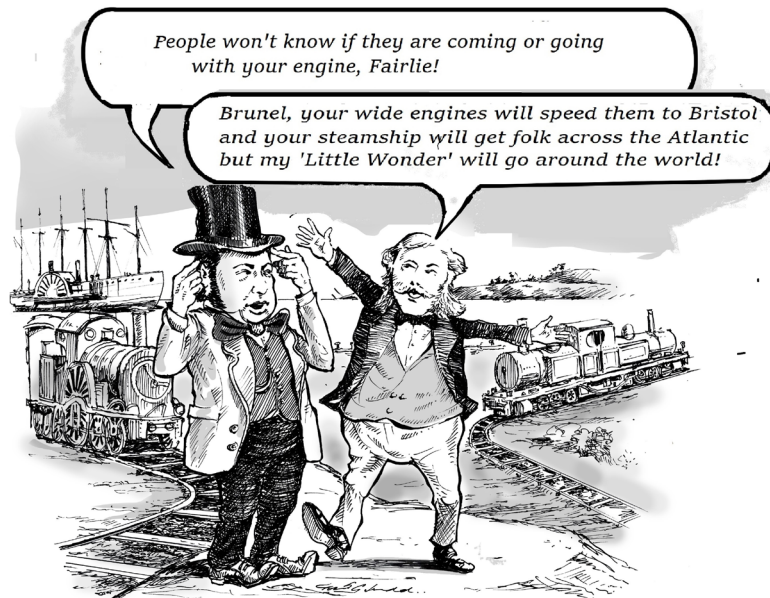


## CHAPTER 4

# FITZGIBBON, FOX AND THE QUEENSLAND NARROW GAUGE



The birth of the 3 ft 6 in narrow gauge in Australia was dramatic.

It is described in the *1888 Picturesque Atlas of Australasia* in a degree of detail that leads one to conclude that whoever wrote it was in the thick of the events of the 1860s. The circumstances that are described seem to have been cast into oblivion in the works of subsequent historians, or maybe the truth was too painful.

After much discussion, Parliament, in view of the circumstances of the colony, determined that a narrower gauge than that generally adopted in older and wealthier and more thickly populated communities, should be employed. A precedent was found in New Zealand, a width of 3'6" was fixed upon...

The expenditure of borrowed money upon public works had been most extravagantly and inexpertly conducted. The distinction between engineers advising the government and contractors engaged in construction had been, in some cases, scarcely maintained. On the railway works, and in dredging operations, enormous extravagances were permitted. The engineers were making immense fortunes; and while this ruinous profusion was draining the resources of the colony, one of those periodical depressions which affect commerce, as seen in Europe, set in, and its effects extended with extraordinary severity to the young community in Queensland.

The Bank of Queensland closed its doors; building societies collapsed under the blow; insolvencies followed in rapid succession. The entire organisation of society appeared tumbling in ruins. The Treasury was actually empty; trust funds, savings bank deposits – all were gone.

To crown the confusion and dismay, the navvies working on the railway construction were turned adrift by contractors who could no longer pay them. In a formidable body, these men seized a train proceeding to Ipswich, and thence marched on Brisbane.

Their approach was heralded and preceded by the most alarming rumours. The navvies had vowed, it was said, to loot the banks, to sack the shops, to burn down Government House, to hang the ministers.

In the late 1850s there had emerged a 'circle' of engineers developing an interest in narrow-gauge railways as an alternative to the Stephenson standard gauge.

During the 18th century there had developed, in England and Wales many tram roads of many gauges of which the 3 ft 6 in gauge was only one.

Why was the 3 ft 6 in gauge of special interest to these engineers?

It was a nice round number. Curiously, it was also half of Brunel's broad gauge.

It was sufficiently far away from the 4 ft 8½ in gauge. It would have been very difficult, for example, to have sold the idea of a 4 ft 4 in gauge. It would have had all of the disadvantages of the Stephenson gauge, and would have introduced a break-of-gauge where there didn't need to be one.

'Sold' is the critical word. These engineers were in the business of selling railway equipment and related services. The Act of 1846 that was binding on the English and Irish railways regarding gauge did not extend to the colonies.

**TWO PROMINENT ENGINEERING PERSONALITIES** with very opposing views on the matter of railway gauges. Isambard Kingdom BRUNEL did everything big. His Great Western Railway was the widest railway gauge, being 7 ft 0¼ in. But in England, at the time, in order to resolve the break-of-gauge, one of the English gauges had to go and it was the GWR's broad gauge. His great steamship, the *Great Eastern* was a triumph for engineering but a marketing and financial failure. Robert FAIRLIE was a Scottish engineer who was an advocate for the 3 ft 6 in narrow gauge. He built a double ended locomotive called the *Little Wonder*. In time the aggregate length of narrow-gauge track in the world was about twice the circumference of the Earth. **ARTWORK - GREG JUDD.**

They had the example of the Ffestiniog railway which was 1 ft 11½ in, which would have been too narrow. It is interesting that the 3 ft 6 in gauge is not very much different to the midpoint between Ffestiniog and Stephenson. If they had set the mid-point between the Stephenson gauge and Ffestiniog they would have finished with 3 ft 4 in. It is recorded that Pihl (next page) had initially considered using the 3 ft 4 in gauge but had modified his plans to the 3 ft 6 in gauge.

But the said 'circle' of engineers seems to have been a very informal one. Certainly most of these engineers were talking to each other or were aware of what the others were thinking.

The other point that must be made is that this was profit driven to the extent that it was an exploitation of the colonies with total disregard to the break-of-gauge chaos that would emerge.

The timing of this narrow-gauge phenomenon was when the opportunities for major railway construction projects in England were winding down.

The Railway Regulation (Gauge) Act of 1846 prohibited new construction of any gauge other than 4 ft 8½ in but was not binding on the colonies.

They had correctly reasoned that the colonies would require railways to connect sparsely populated regions separated by long distances, often facing the obstacle of mountainous country. A slow train was better than no train at all.

There was another attraction in the colonies. Whereas railways in England had been built and operated by companies, in the colonies it was the governments that were building the railways. For the London financiers who had fared badly in the 1840s, this was good news. Governments were more attractive than companies.

The engineers promoting narrow-gauge railways could approach the colonies with the offer of cheap railways, and there would be enough fat to ensure that the engineers would do very well. But to do this effectively they needed to prove that it would work.

## Who were these engineers?

### William Bridges Adams

One of the earliest to advocate for the narrow gauge. He proposed narrow-gauge light railways as being feeders that connected to the main lines. These lines would be worked by horses or small engines. The following is from the *Leader (Melbourne)*, 6 March 1869:

It is 19 years since I first published my system in the Westminster Review...converting the highways and turnpikes to the uses of railways...the gauge of the way to be distinct from the railway proper, in order to prevent the chance of any heavy engine or wagon running on it and crushing it...probably a 3 foot 6 inch gauge for that would permit the use of engines and vehicles 7 feet in width...the road might be wide enough.

The rails should follow the course of the roads on one side or the other...avoiding the middle where practicable, and with passing places for trains going in opposite directions... should run without surplus friction around curves of 50 feet radius and wagons must follow the same curves....

### Captain Charles Harvey Bagot

Bagot was not an engineer but it is appropriate to deal with him here. He was born in Ireland and settled in South Australia in 1840. He had been a captain in the military in India. He took up land north of Adelaide. In 1843 copper was discovered on the property. This became the Kapunda mine and Bagot became very wealthy. He returned to England in 1853-5 where he took an interest in railways and touted himself as a railway expert on return to South Australia. His views on railways were similar to those of Bridges Adams, and it is probable that the two had met in England. On his return to South Australia he became politically active. He was central to the unfortunate decision by South Australia to introduce the 3 ft 6 in gauge.

### William Doyne

Doyne was not an advocate of narrow-gauge railways. He was more an advocate against narrow-gauge railways but it is appropriate to deal with him here. The only narrow-gauge railway he was associated with was the Dun Mountain railway in New Zealand. Previously he had been a contractor for the Colombo to Kandy railway in Ceylon but withdrew from that as it was evident that the estimates for this line were inadequate.

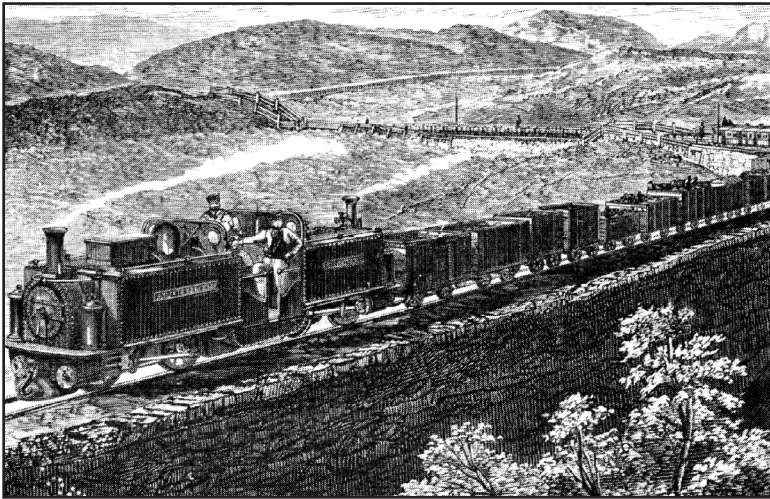
### Sir Charles Fox

The Rainhill trials of 1829 were a contest in which the prize established George Stephenson and his *Rocket* as having a place in history. It was a very close contest and history was not so kind to the entrant that the Stephensons regarded as second, the *Novelty* entered by Braithwaite and Ericsson. Charles Fox was driving that engine.

Thereafter Charles Fox worked with Robert Stephenson, (George Stephenson's son) on the construction of the London to Birmingham Railway. He is credited with the invention of the railway points.

In 1840 he formed a company with John Henderson, Fox Henderson & Co. That company later became Sir Charles Fox & Son.

In a letter in 1867 he declared (*Darling Downs and General Advertiser, (Toowoomba)*, 28 March 1867), that he was not totally committed to the 3 ft 6 in narrow gauge. He specified a gauge of 5 ft 4 in and 'no less or no more'. We are left wondering what he had against the Irish broad gauge (5 ft 3 in). He said he had recommended this gauge for the Indian Tramway Company. Perhaps they were trucking bull elephants?



**THE FFESTINIOG RAILWAY IN WALES.** The illustration is from the 1872, publication by Robert Fairlie, entitled *Railways or No Railways*, that was a promotion for narrow-gauge railways. The locomotive that is featured here is the *Little Wonder* that was built in 1870. Fairlie had patented a double-ended locomotive in 1864 but early efforts had been disappointing. The *Little Wonder* seems to have marked a turn around of the fortunes for the design although the Fairlie engine never achieved the level of acceptance as the Garratt locomotive.

### Carl Pihl

From Norway he went to England before 1850 and worked with Robert Stephenson. He developed an interest in narrow-gauge railways while in England and returned to Norway about 1850. The first railway in Norway had been built to the 4 ft 8½ in gauge. He built the Røros line to the 3 ft 6 in gauge. He developed the centre coupler which was more suited to the 3 ft 6 in gauge than the buffers on the Stephenson gauge.

### Robert Fairlie

A Scottish engineer\* whose initial interest in railways surrounded the Ffestiniog railway in Wales. This was a railway operated by horses for the purpose of transporting slate from the quarry to Portmadoc. Fairlie developed a double-ended engine that achieved some success on the Festiniog line in 1863. He later developed the design for the 3 ft 6 in gauge. (See Chapter 7).

\*Doyne claimed that Robert Fairlie was not a railway engineer but a mechanical engineer.

### Abraham Fitzgibbon

From Ireland, he did railway survey in America, and later worked under Doyne on the Colombo to Kandy railway. The two then worked on the Dun Mountain railway in New Zealand. He then went to Queensland in 1863. Our story of the origin of the 3 ft 6 in gauge in Queensland is mostly about Fitzgibbon and his misdeeds.

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Queensland, as a separate jurisdiction came into being in 1859 with a population of about 30,000, of which 6,000 were in Brisbane and 3,500 were in Ipswich. There were pockets of settlement in the Lockyer and Burnett Valleys, and the Darling Downs but beyond that the population was widely dispersed.

The colony was forged out of New South Wales. The first Governor was Sir George Bowen. The first Premier was Robert Herbert who had come to the colony with Governor Bowen as his Colonial Secretary.

A major issue in the early years had been a divide between the people of Ipswich and the people of Brisbane. Ipswich had been established as a river port.

Transport thus became a source of much contention, particularly during the rainy season, over the Main Range, to Toowoomba. That part was known as 'The Slough of Despond'.

There had been an initial plan for a tramway with wooden rails, to be operated by horses and to a gauge of 4 ft 8½ in.

The Queensland Government, early in 1863, had been in discussion with a Sydney railway contractor, Robert Tooth & Co. That firm had also been in discussion with Abraham (also spelt Abram) Fitzgibbon.

There are serious questions about Fitzgibbon's level of competence or whether he was driven by greed. But the whole of Australia has been the recipient of his disordered thinking, and we are stuck with the consequences. To say that he has caused enormous havoc, both in his own time and ever since, is an understatement. Questions must also be asked about those in government who allowed it to happen. But it must be admitted in their defence that Fitzgibbon was born in County Cork which is the home of the Blarney. If Fitzgibbon spoke like he wrote he would have been a formidable advocate for his cause.

Was Fitzgibbon deluded? He has evidence of an inflated sense of self worth but his behaviour was not obviously too bizarre. The evidence is clearly expressed in the many newspaper reports. Cole\* defended Fitzgibbon:

The decision to build a railway to a gauge of 3 ft 6 in was unfavourably received by a section of the people and the press.

He then supports Fitzgibbon in his choice of gauge:

He came as the apostle of the 3 ft 6 in gauge, and by his strong advocacy, persuaded the Legislature...

\* Cole A E *The early history of Queensland Railways, 1944.*



What Fitzgibbon gave the people of Queensland was a share of his daydream. A cheap and slow steam railway was better than bullock drays. But it came at a cost. Abraham Fitzgibbon is drawn to our attention by the publication of an item in the *Sydney Morning Herald*, 26 November 1861:

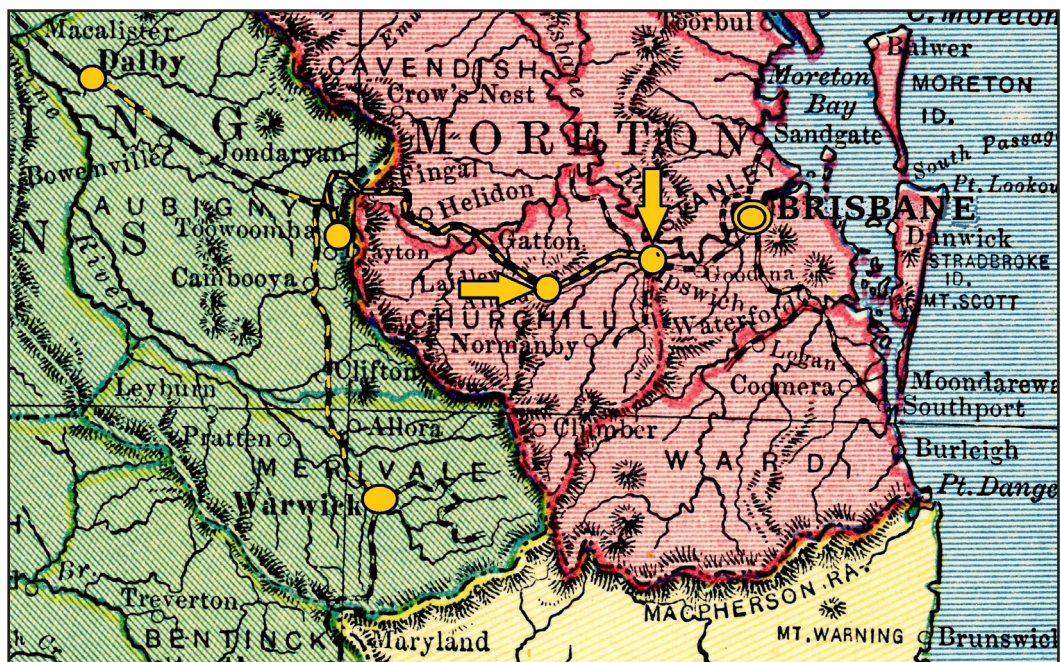
Mr. A. C. FITZGIBBON, of Nelson, in New Zealand, has contributed a small publication towards the elucidation of the much discussed but all-important ...question of railroad construction; and as at this juncture the contribution of every intelligent and experienced person is of value, we very readily give Mr. FITZGIBBON'S circular a place in our columns. This gentleman is engaged in making a railway for the Dun Mountain Copper Mining Company, from their mine to the shipping place at Nelson. The work is at present in hand, but part of it is completed; and it is on the basis of what has been thus done, combined with the written experience in other parts of the world, that he compiles his estimate of what is possible in Australia on a larger scale. The road from Nelson to the mine is a mountain road, and therefore presents the full measure of difficulties in respect to curves and gradients. Eleven miles have been constructed, the rise in that distance being about two thousand eight hundred feet. For five miles the gradient is one in eighteen, and for the succeeding four and a-half miles one in twenty. The curves are incessant, the road being as winding as it is steep, there not being more than half a mile of straight run, and the sharpness of the curves ranges from one to ten chains radius. It is a sidling line, cut along a mountain slope having an inclination to the horizon of thirty-three degrees. Two-thirds of the excavation is in rock, the remainder in clay. The sleepers are transverse, made of black birch timber, eight inches by four and a half inches, placed three feet apart, and packed in eight inches of broken stone ballast with two inches of gravel on the top: a roadway for horses is thus formed.

The cost of the line so far as made, including the importation of rolling stock to the extent of two wagons to the mile, has not exceeded two thousand pounds per mile, the average rate of wages having been ten shillings for eight hours work. This cheapness, however, is partly accounted for by the narrowness of the gauge, which is only three feet six inches. In applying these calculations, therefore, to our own lines we must expand them to meet the necessities of a gauge of four feet eight inches and a half. We cannot reduce our present gauge, nor for trunk lines is it expedient that we should do so. Already our gauge is narrower than that of Victoria and South Australia...'

Mr. FITZGIBBON has not yet tried a locomotive on this line, though it is intended to be worked by steam if the traffic requires. The style of engine proposed, and which he says will prove efficient, is to weigh eight tons and to rest on four coupled wheels. This it is calculated will draw on the level one hundred and sixty tons at a speed of from fifteen to twenty miles an hour; on a gradient of one in a hundred it will move sixty-five tons; on one in forty it will move thirty-five tons; and on one in twenty it will move twenty tons. For so light an engine the rail is not required to weigh more than thirty pounds to the lineal yard, but in order not to overtask the engine special attention is paid to making the carriages as light as possible, the weight of the vehicle not being allowed to exceed one half the weight of the load. Though the gauge is narrow, the carriage bodies are made seven feet wide, so that one carriage will accommodate forty passengers.

Mr. FITZGIBBON calculates that ten miles of this sort of line might be made at the rate of two thousand two hundred pounds per mile. This estimate includes the cost of importing one engine and twenty carriages...as thus designed, is considered available either for light engines or for horse-power, or for both.

FROM THE PICTURESQUE ATLAS OF AUSTRALASIA OF 1888. The Ipswich to Grandchester railway is identified by the two arrows. The railway west to Toowoomba is highlighted in yellow, as are the routes to Warwick and Dalby. The round-about route to Toowoomba is testimony to the obstacle presented by the Great Dividing Range.



That was an invitation to dig deeper:

***The Launceston Examiner* 14 December 1861:**

We purposely omitted the larger portion of Mr Fitzgibbon's circular because it was far from reliable. Lest however we should be charged with unfairness to him...believe it will be found that the traction power of the engine is greatly over rated and the estimate for construction..much below the actual cost.

***The Herald, Melbourne* 2 December 1861:**

Fitzgibbon asserts that 'the writer is able to state from actual experience of railway construction in Europe, America, Ceylon, and New Zealand that a line of the description given can be constructed and equipped for the estimate mentioned'.

In May 1863, Queensland had seen much political turmoil arising from the railway question, which resulted in the fall of the first Ministry and the dissolution of the Parliament. In the subsequent election Robert Herbert had been returned but with a clear message from the electorate that the railway should proceed. Abraham Fitzgibbon had arrived in the colony two days after the fall of the Government. His rise was spectacular for within weeks he was appointed Chief Engineer and by the year's end he was also Commissioner of Railways.

The ***Courier, Brisbane*, 5 August 1863**, reported the circumstances of Fitzgibbon's acceptance by the Parliament. It was clear that the Parliament was in a hurry to get the project underway, and the Parliament, in turn had been goaded in this direction by the people. The statement is by the Minister for Lands, Macalister\*, which refers to 'the firm' as Robert Tooth & Co.

He would introduce to the house, the name of a gentleman who had much to do with the matter, Mr Fitzgibbon. That gentleman, accompanied by one of the members of the firm from whom the proposition to hand already mentioned emanated, arrived in the colony two days after the dissolution of Parliament, and when it was understood by his principal that the offer could not be accepted and part payment of the sum for the construction of the railway could not be made by gift of public land to be selected where they chose, it was determined to break off the bargain.

The Government, then with the idea of getting as much information as possible upon the subject, had managed to effect a transfer of services of Mr Fitzgibbon. It had been asked who and what that gentleman was and he (the Minister for Lands) could say that in his opinion the fact that he had been introduced by the firm of Robert Tooth & Co... Documents had been produced confirming that the person named was a gentleman of superior ability and that his social position was beyond question... the shareholders of the company had engaged Mr Fitzgibbon to proceed to New Zealand to superintend the Dun Mountain railway and in the construction of that work Mr Fitzgibbon was able to keep within the estimates he had framed.

\*Arthur Macalister, was Qld Premier 1866-7.

We can accept that Fitzgibbon was in America. The entry in the *Dictionary of Irish Biography* notes that he was surveying the Illinois Central Road which occupied four years from 1852 and covered 700 miles. In this task, we are informed that he was contracted to Fox Henderson Co. The tenor of the biographical entry is rather benign, suggesting that it may have been submitted by a descendant. The suspicion is that the survey was a major undertaking and that Fitzgibbon was one of many involved in the survey. Of the first railway in Ceylon (Sri Lanka) from Columbo to Kandy the contractor was William Doyne. The entry in the *Irish Dictionary of Biography* notes that Fitzgibbon was the 'principal assistant engineer from 1857 but this difficult project was suspended in 1860.'

The point of contention is that the Illinois Central Railroad was initially built to the 5 ft gauge and later converted to the 4 ft 8½ in gauge. The gauge of the mainline railways of Ceylon has always been 5 ft 6 in. Thus, there is no evidence in support of Fitzgibbon being involved with a narrow-gauge railway in India or Ceylon. The entry in the *Dictionary of Irish Biography* states that Fitzgibbon 'was invited to Australia by the Government in Queensland'. In June 1863 the Government asked for a report.

That last point is misleading. Fitzgibbon was engaged by Robert Tooth & Co but the negotiations faltered. Fitzgibbon had already written to Robert Tooth & Co, making the claim, that based on the description of the country as it had been described to him, he was of the opinion that the line could be built for £4,000 per mile but qualified that by adding that he would need to inspect the country in order to reach a final figure. That was included in a letter from Fitzgibbon to Robert Tooth & Co and dated 3 March 1863. That letter was tabled in the Parliament together with correspondence from Robert Tooth & Co on 19 May. The outcome of the debate saw the House divided on the matter and was resolved on the casting vote of the speaker and the Parliament was dissolved.

The content of Fitzgibbon's letter was just what the new Government wanted to hear. But it had clouded their judgement. In June the Government instructed Fitzgibbon to survey the route of the Toowoomba railway and provide a report.

Queensland newspapers at the time seemed reluctant to air their dirty linen and we next find that the editors further south were onto the facts. The Queensland correspondent to the ***Geelong Advertiser*** submitted the following which was published on **24 November 1863**.

There seems to be something unpleasant brewing about the appointment of Mr Abraham Fitzgibbon, our Engineer-in-Chief and the disciple of the 3 feet 6 inch railway gauge. It appears that though Mr Fitzgibbon has been gazetted to an appointment of such importance that there is no salary attached thereto; but he has a very fat contract for surveying and laying out the line of railway.

It further appears that he is the agent of the firm of which Sir Charles Fox, an eminent English engineer, and a Mr Henderson are heads, for introducing and working narrow gauge railways in the colonies: and the firm are also the patentees of these peculiar railways.

The above correspondent of the *Geelong Advertiser* then continued:

Query - do the firm as well as the Government pay our Engineer-in-Chief? I know that our Minister of Lands and Works (who is still in Sydney) knew of Mr Fitzgibbon's connections with the company before our Railway Act was passed and he is getting playfully badgered by Mr Whitton and other able engineers in Sydney for the manner in which they say our Government has been 'sucked in'. If all that has been stated be true, the country will have to pay the piper for the cheap railways!

It is worth remembering that this was all happening before telegraph communication with England and the usual delay between the colonies sending dispatches and their arrival in England was about eight weeks.

John Whitton, who is mentioned above, was the Engineer-in-Chief of the New South Wales Government Railways. He endured many years of badgering by the advocates of the narrow gauge but remained a resolute defender of the New South Wales network being infiltrated by other gauges. There were only two places in New South Wales in the 19th century where the colonial boundary was penetrated by a foreign gauge; at Moama in 1876, and the Silverton line in 1888.

Fitzgibbon's 1861 circular eventually drew comment from William Doyne, who submitted a letter to the ***Northern Australian***, which published it on **24 February 1864**. The use of bold is mine. I have used it to draw attention to the major flaws in Fitzgibbon's 1861 paper - JLW.

**As this statement is very erroneous and I am in the position to give the exact facts of the case,** I trust that you will lend the aid of your columns to correct a mis-statement that has already been too largely circulated.

The Dun Mountain Railway runs from the Port of Nelson to the company's mines, which are situated on the mountain 13 miles by the railway from the Port and 2800 feet above it. **It is a railway of 3 feet gauge with rails that weigh 30 pounds to the yard and worked by horse power only...**

I was the consulting engineer for the railway in question, and as I designed the works for it, I am familiar with all the circumstances attending its construction.

This system is admirably adapted for the purpose for which it has been constructed on, from the whole of the traffic being worked down by gravitation, and the horses only having to haul the empty wagons up the incline; but, in my opinion, such a line would be altogether unsuited to the general traffic of the country; **and the introduction of locomotives in this case only results in failure inasmuch as...would produce an enormous wear and tear in their descent.**

Mr Fitzgibbon ultimately published a paper, in which he meant to advocate a system of cheap, small gauge railways, worked by light locomotives proposed by Mr Bridges Adams for use in India as feeders to the main lines, and, given considered suitable generally for New Zealand; and in this paper he introduced some particulars of the Dun Mountain line; **but by inadvertence of expression and somewhat out of confusion mixed Mr Adams theory with the facts of the Dun Mountain Railway, the readers of that paper have been led to imagine that the latter has been worked by locomotive power and has been constructed for Mr Adams' estimates.**

**Mr. Fitzgibbon has now undertaken the construction of an extensive line of railway for the Government of Queensland, on Mr. Adams' principle; and while I am not prepared to give my adhesion to that principle for general application, neither am I prepared to say that it is not applicable to the case in question; but as a rule I have no hesitation in stating my opinion, that any half measures in locomotive railway construction are a mistake—that in, either a substantial locomotive line should be constructed of a gauge and strength capable of carrying powerful locomotives, or simply light-horse railways or macadamised roads.**

I am, Sir, your obedient servant,

W. T. Doyne.

A few points to consider:

Fitzgibbon had promoted himself as having designed the Dun Mountain railway. It had been designed by Doyne. We will see in subsequent evidence that Fitzgibbon was fired with an obsession to promote the 3 ft 6 in gauge and he had used the Dun Mountain line as the pioneering example in the southern lands. But the Dun Mountain line was 3 ft gauge, which would have been patently clear to any engineer working on the line. He deliberately changed the gauge when he wrote his circular in 1861.

He has written a lot about locomotives being used on the 3 ft 6 in gauge but he had never seen a locomotive of 3 ft 6 in gauge because in 1861 it was yet to happen. The first 3 ft 6 in railway built for locomotive haulage was the Røros line in Norway that was opened in 1862.

The circumstances of Fitzgibbon being invited to survey the railway route and provide a report raise some questions. The first is the origin and veracity of the 'documents' that appear to have been taken on face value. In the three or four years prior to his arrival in Queensland he had only worked with William Doyne.

Any document provided by Doyne, we would expect would have made clear that it was Doyne who was in charge. Premier, Robert Herbert returned to Queensland early May following a visit to England. We are advised that while he was away he had obtained some information about light railways being built in Sweden and India. The circumstances of Fitzgibbon being invited to survey the railway route and provide a report are unclear.



In 1863 Fitzgibbon wrote his report that comprised 79 paragraphs (and fairly lengthy and long-winded paragraphs they generally were). This was the report that would be the basis of the Queensland Government installing Fitzgibbon as the Engineer-in-Chief and the Commissioner of Railways. With that came the 3 ft 6 in gauge, but we will see that the Government had already made that decision. **The Courier, 4 August 1863** dissects this verbiage:

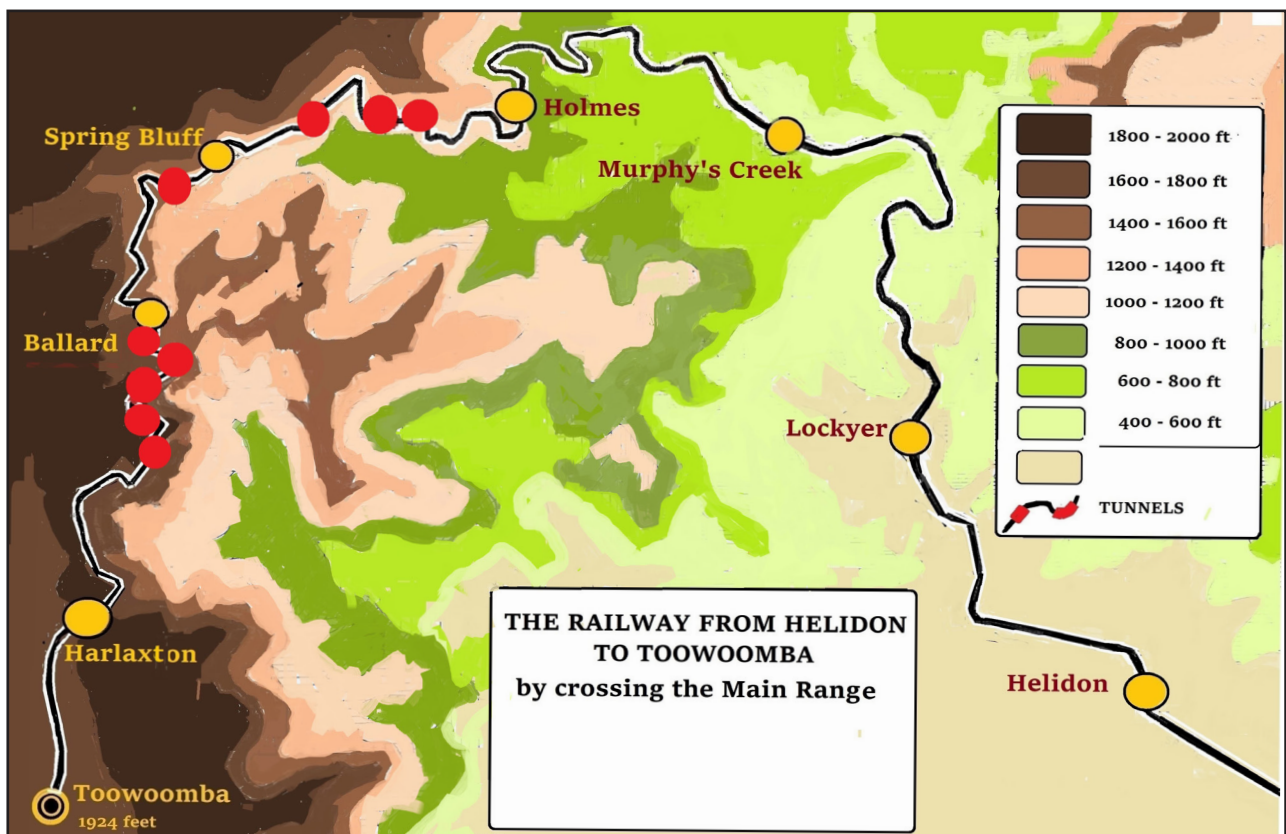
With Mr. Fitzgibbon's opinion, that the right object to be kept in view is the opening up of the country at the minimum of capital outlay, we perfectly concur, but we do not see how his favourite gauge of 3 foot 6 inches will secure this. We should like very much to be informed of any trunk line on which such a narrow gauge was adopted, or where the locomotives have been constructed to run upon them. If they have ever served an efficient purpose...they have so far answered every end as to recommend themselves to the patronage of engineers generally, where is the record...But if this 3 feet 6 gauge for locomotive traction is only the pet of Mr. Fitzgibbon, and yet experimental, we cannot quite accept it upon his solo authority.

**THE RAILWAY ACROSS THE MAIN RANGE.** This map has been produced, based on a black & white map in an article written by John Knowles, ARHS *Bulletin* April 1967.

Nor is such the authority upon which a loan of a million and a quarter should be raised. And we are the less satisfied that we find a marvellous amount of discrepancy in the several paragraphs comprising this second section of the report.

In the 21st (paragraph) it is thus written-- "Again, whereas upon lines having a 4 feet 8½ inch, or under, gauge, curves of less than 10 chains cannot with prudence be used except at stations; upon a line such as that I propose curves of half that radius may be adopted with safety, thereby affecting an immense saving in works wherever the course of the line is tortuous through broken country or sidelong ground." We are very much inclined to doubt this, and to enforce our doubt by plain mathematical reasoning--not as to the practicability of running small machines round small curves, but the prudence of making the narrow base afforded by a 3 ft 6 in axle, the support of ordinary seven feet carriages.

But it is useless to controvert an assertion, touching part of a proposed plan where its author himself contradicts, both directly and impliedly his principal position...the great economy resulting from his employment. In the 29th paragraph Mr. Fitzgibbon tells us that his formation level is 15 feet and this will allow the bridges to be strengthened hereafter wherever it may be necessary to lay down a heavier description of permanent way, and to use very heavy and powerful engines, with a 4 ft 8 ½ in or 5 ft 6 in gauge. In such an event the light permanent way, after being taken up, may be relaid in extension of the main line or as a branch line thereon." Has Mr. Fitzgibbon never heard of the loss and trouble arising from break of gauge?



How will the 3 ft 6 in and 4 ft 8½ in connect? It will then be a matter of unloading and reloading at every junction with a branch, as well as that at the extension. And what will be the value of his light permanent way after four or five years' use? But here we have Mr. Fitzgibbon planning his earthworks for an ultimate rail of 4 ft 8½ in or even 5 ft 6 in gauge. How, then, can he lay it down for curves suitable at 3 ft 6 in, such being in reality only half the radius necessary for the larger one. If the line is constructed for the small gauge it will not suit the heavy traffic when it comes: curves, earthworks, and all connected with them, will have to be all thrown away, and away flies one merit after them. If it is to suit the future and be available hereafter, the economy of 3 ft 6 in disappears, and away with another advantage.

What Fitzgibbon was saying here was that he would have the road bed and the earthworks built to the specifications of the narrow gauge (that is with 5-chain curves) and that in five or ten years, the traffic could have grown to the extent where more substantial track was needed, he would rip up the narrow gauge track and put down track at 4 ft 8½ in track. But the reason he would not put down the wider gauge at the outset was that the 4ft 8½ in gauge was not compatible with 5 chain curves. That was very disordered thinking.

Ipswich was chosen as the starting point of the railway as it was the point on the river that flat bottom boats could reliably access. The ask was for the railway to connect with the rich agricultural country of the Darling Downs.

The railway from Ipswich to Bigge's Camp (later renamed Grandchester) was opened on 31 July 1865, and thus takes its place in history as Australia's first 3 ft 6 in railway, and the second steam railway of that gauge in the world. It was done at a cost vastly exceeding the original estimate.

On the matter of cost, ***The Adelaide Observer*, 29 October 1870**, provided figures. This was at a time when the narrow-gauge movement was making progress in South Australia.

Fitzgibbon had made his initial pitch to the Queensland Government that the railway from Ipswich to Toowoomba would cost £4,000 per mile. Once it had been surveyed that rose to £8,951 per mile. When it was all done it had cost £15,820 per mile. Fitzgibbon approached the Main Range with a railway that was a succession of sharp curves. That legacy persists to the present although there has been some modification to curves and bridges over the years. It should be recognised that this route, with its extension to Warwick, became the connection for passenger services between Sydney and Brisbane in 1889. Most of the requirements for the construction of the railway were imported from England where Sir Charles Fox was the consultant and agent for the Queensland Government.

The evidence suggests that Fitzgibbon's engineering skills were not up to the task. There were problems with the bridge over the Bremer River.

The railway across the Main Range probably met the needs of that time but is not meeting the needs of the present and the future. The Inland Rail project is presently underway and aims to build a standard-gauge freight line from Melbourne to Brisbane.

The idea was first floated in 1910 by then Prime Minister, Andrew Fisher. The present plan is for a tunnel of 6.2 km under the Range. This tunnel would allow two tracks for standard-gauge freight trains with double stacked containers but is presently only a series of dots on a map between Helidon and Gowrie.

In early 2023 a progress report of the project noted a cost blowout from the original estimate of \$9 billion to \$31 billion. History repeating itself? More on the Inland Rail project in Chapter 24.

The construction of the railway across the Main Range presented many opportunities for the engineering of both Fitzgibbon and Sir Charles Fox, to go wrong. In that respect it did not disappoint.

It all came to an end for Fitzgibbon in July 1867. He petitioned Parliament and when that didn't work he appealed to the newspapers. From a correspondent to the ***Courier*, 29 July 1867**.

That he will long be remembered, there is little doubt; the legacy which he will leave in the shape of light rails, sharp curves, falling bridges, sinking embankments, and consequent heavy cost of maintenance and repairs, will secure the memory of him being most affectionately cherished.

However glad we may be to get rid of him, there are one or two little matters that should receive attention before he leaves the colony. Who is to pay for the alterations to the Bremer Bridge, the construction of a new line over the Mihi Creek, or the rebuilding of the face of the tunnel which fell in a month or two ago? No one disputes the fact that all these losses, amounting to twelve or fifteen thousand pounds, are the result of bad engineering, either through carelessness or the want of skill; and the Engineer-in-Chief was paid by contract to do the work properly. He has the credit of endeavouring to be sharp enough with other contractors; a little of the measure which he gives to others, might profitably and with justice be measured out to him. The colony will have to submit to a heavy annual loss in consequence of Mr Fitzgibbon's want of skill... a small lesson taught to him through his breeches pocket might tend to improve his experience as an engineer.....

Ultimately the Queensland Parliament engaged the services of William Mason, the Acting Engineer-in-Chief of the New South Wales Railways, who came to Queensland and produced a report. It found that the works had been of an inferior standard and the cost had exceeded what a line of 4 ft 8½ in would have cost. Thomas Higinbotham of Victoria was also invited. His report was similar to Mason's.

It is worth considering the effect on Toowoomba if the railway had not been built.



One suspects that Toowoomba may have developed into a much smaller community than at present and the development of the Darling Downs would have been much slower. So, while it was disaster, given the wider and long-term implications, we can understand why Fitzgibbon was regarded by some as a sort of hero.

The following exhortation by the *Brisbane Courier*, **21 January 1867**, was begging to be included herein:

When the history of railways in Queensland comes to be written...it will form a most humiliating narrative of the colony, reckless extravagance, flagitious jobbery, a bankrupt treasury, political dishonesty, almost if imposed on by one man for his own selfish purposes.

**The above had been a late entry in this book. Prior to that I had been wondering if I had been too harsh on Fitzgibbon, and should mellow my words. I needn't have concerned myself. JLW.**

Sir Charles Fox and the other narrow-gauge aspirants back in England needed to catch a big fish to convince the world that the 3 ft 6 in gauge would be a viable alternative to the Stephenson gauge. With Queensland they had that fish.

To better understand those movements I have plotted the fast-moving events of 1863 concerning Fitzgibbon, Sir Charles Fox and the Parliament of Queensland.

**February 1863.** Premier, Robert Herbert was in England and planned to return by the next mail steamer. It appears that his visit was of a personal nature and we can only speculate that he may have had dealings with Sir Charles Fox and other railway identities. He certainly had dealings with financiers in England who were eager to provide the necessary funds for a proper railway.

**March 3.** A letter from Fitzgibbon which was tabled in Parliament on 19 May. Only the relevant parts are included here:

...railway such as I have described could be constructed for about £4000 per mile exclusive of land and rolling stock and buildings, which would depend upon the amount of traffic to be provided for.

This estimate might be somewhat modified upon a careful examination of the ground, and ascertaining the amount of formation and bridging required. The rails laid for such a line should last 15 to 20 years and the sleepers eight years.

Upon the 3'6" gauge, such as that proposed, the carriage bodies would be 7 feet wide, and maybe 20 to 30 feet in length.

I think such a line as that described could be constructed in working order – say 120 miles in length, within two years from the commencement of the works.

Comment: those 7 foot carriages smell like Fitzgibbon and William Bridges Adams reading from the same page.

The Minister of Lands (Mr Macalister) in introducing the Bill, advised:

The house must understand that the Government has entered into no arrangement whatever with the parties who had tendered, but had rather deferred entering into the question without the concurrence of the house.

**March 21.** A letter was written by Robert Tooth and company with an offer to the Queensland Government to build a railway. This was tabled in Parliament on May 19. It appears that the company had engaged the services of Fitzgibbon who was on his way to Queensland and would examine the country. The debate on the bill was equally divided and required the casting vote of the speaker. The final outcome was that the Parliament was dissolved. But the people had spoken and made clear to the Government that it would have to proceed with the railway.

The Government did not proceed with the said company, but it appears that when Fitzgibbon did arrive he was promptly given the task of doing a survey and writing a report for the Government.

**May 21.** Fitzgibbon arrived in Queensland

**June. 12.** Elections .

**June 13.** Herbert remained as Premier.

**July 9.** Fitzgibbon's report was presented. The proposal included the matter of the gauge.

**THE A10 LOCOMOTIVE**  
built by Neilsen. One of the original engines in 1865. The oldest locomotive in Australia in operational condition.  
**PHOTOGRAPH NATIONAL RAILWAY MUSEUM.**



**August 4.** Debate on The Railway Bill has mention of Sir Charles Fox.

**August 18.** The Legislative Assembly passed the Bill, but there was discontent over the choice of gauge.

**September 4.** The Bill received Royal Assent.

**September 23.** Fitzgibbon was appointed Chief Engineer.

**November 11.** The date of the item in the *Geelong Advertiser*, noting that Sir Charles Fox had been appointed. But we have no information when that had occurred.

**December 23.** Fitzgibbon was appointed Commissioner of Railways.

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Of those engineers we met at the beginning of this chapter there were winners and losers.

Abraham Fitzgibbon returned to England and didn't further pursue an engineering vocation. He was better off to the tune of about £60,000 (according to Knowles) for his Queensland experience. That was at a time when a tradesman could expect to make £200 per annum.

Robert Fairlie had some initial success with his double ended engines and promoting the 3 ft 6 in gauge to many countries. His health was affected when he was establishing a narrow-gauge railway in Venezuela. There is more about Fairlie in Chapter 7.

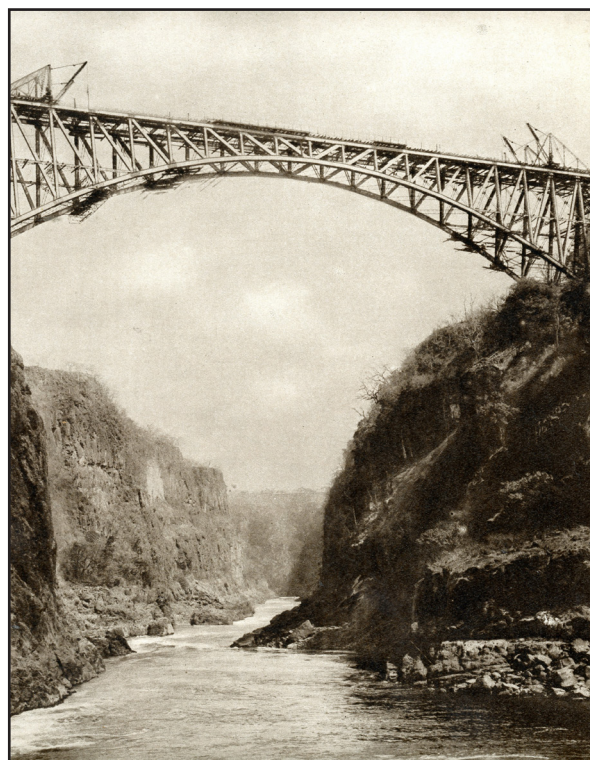
Carl Pihl became Director of the Norway State Railways where more narrow-gauge track was laid in Pihl's time but after his death in 1897 the first of his lines was converted to the 4 ft 8½ in gauge.

William T Doyne established a consultancy in Melbourne. He was consulting engineer for the Launceston and Western Railway in Tasmania and provided services to Western Australia and South Australia, both of which had sizeable mileages of narrow-gauge track but he remained a vocal adversary of railway networks relying on two different gauges.

Captain Bagot continued to occupy his seat in the South Australian Legislative Council to 1869. He died aged 92, in 1880. Thus, he lived long enough to see the realisation of his gauge folly. The break-of-gauge at Hamley Bridge was in January 1880. Hamley Bridge was the beginning of the break-of-gauge chaos in Australia. See Chapter 9.

William Bridges Adams died in 1872 but in 1863 made a contribution to the narrow-gauge movement with his invention of the radial axle with rubber components that allowed the axle to be steered into a curve, thereby allowing the locomotive to negotiate the sharper curves of the narrow gauge. The radial axle of the tilt train appears to be a development of this invention.

Sir Charles Fox died in 1874. It comes as little surprise to learn that his business came out of this Queensland experience better than the others.



**THE VICTORIA FALLS BRIDGE**, crossing Zambesi River by the Rhodesia Railways, designed and built by Freeman Fox. Illustration from *Railway Wonders of The World*.

His son, Charles Douglas Fox, had become well established and pursued many railway projects. They had a large involvement in the Cape rail network which was narrow gauge and they were totally involved in the development of railways in Rhodesia (now Zimbabwe). One outcome of that has been the 3 ft 6 in gauge is becoming known as the 'Anglo-Cape' gauge.

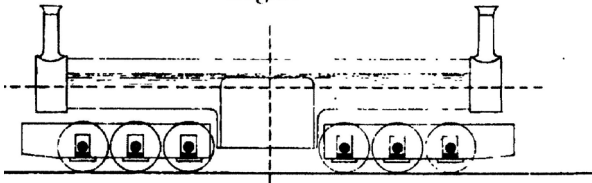
There were also narrow gauge railways in India and South America. Sir Ralph Freeman joined the firm which eventually became Freeman Fox and Partners. They were responsible for the bridge over the Victoria Falls in 1905, and the Sydney Harbour Bridge in 1932.

At its height the mileage of the Queensland Railways network was over 6,300 miles (10,250 km). There was a time when much of the Queensland system was rickety track of 41 pound rail. Not today, for the greater part of the Queensland system is heavy rail on concrete sleepers. To a greater or lesser extent the narrow-gauge lines in the other states and territories were built because of the Queensland experience. In 1957 the total narrow-gauge mileage in Australia was 12,567 miles (19,750 km). That's halfway around the world.

But despite its popularity, the 3 ft 6 in gauge does not work well when it meets the 4 ft 8½ in at a break-of-gauge. The Queensland experience has also taught us that there are two other major disadvantages of the 3 ft 6 in gauge. The proponents of the 3 ft 6 in gauge promised more miles for the price and that is exactly what happened. Thus there is an enormous mileage of 3 ft 6 in track and we will see in subsequent chapters, that in 1921, and again in 1945, the magnitude of any attempt at converting the Queensland tracks to standard gauge has defied a solution.



Fig.5.



A SCHEMATIC DIAGRAM OF THE DESIGN of the three engines that had been supplied to Queensland but were returned to the builder. It has been claimed that they were the most unsuccessful locomotives ever to grace Australian rails. This diagram is from Fairlie's book where he uses a series of drawings to defend the shortcomings of the engines in Queensland.

The second adverse impact of the 3 ft 6 in gauge is relevant to the people who perceive the concept of railways having a role in nation-building. I do. The effect has been to split the nation in half.

The locomotives for the railway were ordered by Sir Charles Fox. There were 4 engines of a 2-4-0 wheel arrangement built by Avonside. There were also some contractors' engines that passed to the Queensland Government at the end of the contract. These were a 0-4-2 wheel arrangement built by Neilsen, and one of these has been preserved. All of the above have subsequently been allocated the A10 classification.

Then there were the three Fairlie engines, which would suggest a degree of contact between Sir Charles Fox and Robert Fairlie. On the advice of Sir Charles Fox, an order was placed for three engines of a design by Robert Fairlie. This Queensland order was only the second lot of Fairlie engines built for the 3 ft 6 in gauge. These engines had been built by John Cross, and according to early reports to the Fairlie design. Robert Fairlie had patented the design in 1864. But these engines were apparently not Fairlie engines. Robert Fairlie denied any involvement

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There are some, I expect, in the railway fraternity, and particularly in the narrow-gauge states, who may find themselves uncomfortable with the content of this chapter. I make no apology. Fitzgibbon did not have the skills for the job. And he did not have the insight to see that he didn't have the skills. His one great skill had been the ability to write reports written at unnecessary length with the theme that if there was a problem its origin was somewhere else. The Parliament was also lacking the necessary insight.

In nearly every book or article that I have read, on Abraham Fitzgibbon, he has been portayed as the archetypal hero who got the railway across the Main Range to Toowoomba and was able to establish the 3 ft 6 in gauge, that had been previously unproven for mainlines. If heroes are needed then I suggest the engineers who followed Fitzgibbon and made it work.

The Inland Rail project presently underway has been suggested as presenting Queensland with an opportunity for further penetration of the standard gauge. The present situation is that the gauge discord has effectively cut Australia in half. See Chapter 24.

What if the Queensland Government had engaged an engineer of John Whitton's calibre who rigidly defended the 4 ft 8½ in gauge? How would a Whitton have built the railway to Toowoomba. This is not the last time in this volume that we hear that curves, and not gradients, are the prime enemy of the railway engineer. Fitzgibbon's gradients were uncompensated 1 in 50. Whitton used gradients as steep as 1 in 33.

When Fitzgibbon presented his report and costings to the Parliament in August 1863, *The Courier*, 4 August 1863 closed its reporting:

There are many other points on which a continuance of this examination might be useful but we have exhausted our space. One of these points is the absurdity of spending so large a sum for so small a traffic without first inquiring what other means may be at hand. But we leave these for the present. Sufficient for the day is the evil thereof.

There is one outstanding matter that needs to be aired. The 3 ft 6 in railway with its tight curves offered a cost advantage when compared to the construction of a railway of 4 ft 8½ in gauge. But we note that the final cost vastly exceeded the original estimate, which begs the question of whether a competent engineer could have built a 4 ft 8½ in gauge railway for less than what the Queensland people paid for a shoddy job with the 3 ft 6 in gauge. Of course, it is easy to be wise after the event but we have the reports of William Mason and Thomas Higinbotham.

Mason's report is summarised in the *Northern Argus (Rockhampton)* 1 July 1868 with the following key points:

The line ought to have run on higher ground, which was available...numerous curves exist which were totally unnecessary - that, in fact the engineer seems to have made no attempt whatever to avoid obstructions till he was close upon them...To quote his own forcible language the lines "are made to wriggle round the base of every little hill in their course"... in many instances bridges had been constructed where embankments would have been preferable.

Thomas Higinbotham is reported in the *Brisbane Courier*, 30 January 1867:

I should advise the Government to make the most careful and thorough survey of the whole of the Liverpool and Main Ranges (precisely what we have paid Mr Fitzgibbon for on the assumption that it has been done) with the view of determining whether it may not be desirable to adopt much steeper gradients with less sharp curves and a wider gauge.

The indications are that Fitzgibbon was determined to build a railway of 3 ft 6 in before he set foot in Queensland. Whether that was driven by a sense of self-gratification or whether he was motivated by some misguided loyalty to Sir Charles Fox and his cronies, we will never know.