

THE BREAK- OF- GAUGE – A SOCIAL HISTORY

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TIM FISCHER. *This book is dedicated to the memory of the late Hon. Tim Fischer.* 4 pages, which include comments by Judy Brewer Fischer, and recollections by Bob Sampson OAM, of Tim's association with the National Railway Museum.

MISSION STATEMENT. 5 pages.

There are two pages that describe the mission. Followed by two pages that give a condensed history of the break-of-gauge using the Trove search facility as a proxy for the amount of noise (or havoc) in any year. And the fifth page is 'etcetera' which includes an inventory of the major gauges and their measurements and their nomenclature. And there is a piece for those who love or hate hyphens.

CHAPTER 1. *The Track to the Centre of the Earth.*

We can't deal with gauges until we have dealt with track. We talk about gradients, the structure gauge and the loading gauge and introduce the concept of the 'right of way'. The right-of-way being unlimited as to depth and hence the title of the chapter. I deal with the problem of contamination of the railway corridor and what to do with the corridors of dismantled railways that are not of tourism potential. Third-rail and gauntlet track are explained. There is the concept of threats to the integrity of the track where I start the list with rabbits and floods, and finish with members of Parliament. I have been greatly assisted in preparing this chapter by Des Smith, previously Chief Civil Engineer of Australian National Railways

CHAPTER 2. *The Cantankerous Business of Railway Curves and their Cant.*

Having dealt with track, we can't deal with gauges until we have looked at curves. There are examples of reverse curves. Curves impact on tractive effort and result in increased wear and maintenance. We learn about circular curves vs transition curves, and the application of cant (super elevation of the rail on curves). And there are vertical curves as well as horizontal curves. The tilt train and wheel squeal get a mention. These pages contain a lot of Des Smith's wisdom.

CHAPTER 3. *The Origin of the Irish Broad Gauge in Australia.*

Previous researchers or historians have attributed the schism between the 4 ft 8½ in and the 5 ft 3 in to Francis Webb Wentworth Sheilds, who was the engineer of the Sydney Railway Company, or alternatively Lt Governor LaTrobe. I submit considerable references to arrive at the conclusion that both were innocent, and the culprit was Governor General, Sir Charles FitzRoy. There has also been a near universal problem surrounding Gladstone's 1846 advice to the colonies. It seems that the misinterpretation of this has been copied from one researcher to the next. This chapter has been deeply researched and runs to 10 pages. I admit that it is not easy reading, but it was necessary to straighten out history gone wrong.

CHAPTER 4. *Fitzgibbon, Fox and the Queensland Narrow Gauge. 10 pages.*

Nearly every book or article that I have sourced has painted Abraham Fitzgibbon as the archetypal hero who got the railway across the Main Range to Toowoomba and his faith that the 3 ft 6 in gauge, previously unproven, would see Queensland right for its main trunk railways. I am firmly of the opinion that Fitzgibbon had a thought disorder and was an incompetent engineer. I think the real heroes were the engineers who followed Fitzgibbon and made the 3 ft 6 in work. The Fox mentioned above was Sir Charles Fox, the engineer who was engaged by the Queensland Government as the consulting engineer. This chapter reads more like a 'who-dunnit'. I am expecting some spirited correspondence from Queensland.

CHAPTER 5. *Praise be to the '5 FOOT 3'. 5 pages.*

The origins of the 5 foot 3 in gauge were in Ireland and are presented. It also looks at the 5 ft 6 in gauge in Spain and Portugal. The BART system in San Francisco adopted the 5 ft 6 in gauge in 1972 in preference to the standard gauge. The prime reason driving the wider gauge was the desire to give commuters a better quality of ride. We have presently, in Adelaide, a Metro system that is self-contained. It has, by default, evolved into a BART system but with 5 ft 3 in gauge instead of 5 ft 6 in. There has been upgrading of track in recent years with gauge convertible sleepers but there is presently no plan to convert the gauge from the 5 ft 3. I put the case that we are better sticking with the 5 ft 3 in from the operational perspective and financially. We don't seem to have heard

much from the South Australian Department about passenger comfort. This topic also has some relevance to Greater Melbourne. And why did Brazil change from '5 ft 6' to '5 ft 3'? And who and how did they arrive at '5 ft 3'? I have been corresponding with a researcher in Belfast.

CHAPTER 6. *The Curse of the North-South Transcontinental Railway. Part One.*

As early as 1858 there were people in South Australia who had a dream of great wealth flowing from the Northern Territory, despite the fact that no white man had crossed the continent. As part of that dream in the 1860s they would have an overseas syndicate build and operate the railway in exchange for a sizeable area of South Australia. The offer was with the condition that they would run one return mixed train journey each week. Now we meet Captain Charles Harvey Bagot, an elder statesman of the South Australian Legislative Council who fancied himself as a railway expert and hoodwinked the Legislative Council into changing the gauge for the line from Port Wakefield to Hoyleton. Sir William Jervois was the Governor who, in 1878, turned the first sod of the new railway at Port Augusta. It was only to go 200 miles to Government Gums (Farina) but Sir William announced that it would go all the way to Port Darwin.

CHAPTER 7. *Robert Fairlie and his Double Engines. 7 pages*

Fairlie was a Scottish engineer who invented a double-ended engine, but his business plan was to sell narrow-gauge systems to the colonies with the slogan that slow railways are better than no railways.' He published a book in 1872. He was a prolific letter writer to newspapers and journals in Australia and England and they willingly copied it. He had an agent in Victoria and that colony was at the top of his hit list in 1869 – 1872. Regional newspapers and railway committees throughout Victoria badgered members of Parliament. Thomas Higinbotham, the Victorian Engineer-in-Chief, was not convinced. Fairlie also sought to sell his system in New South Wales and mounted a vigorous campaign. We meet John Whitton who was the Chief Engineer of the New South Wales Government Railways and was one who could match Fairlie's capacity for letter writing, word for word. He was a fierce defender of the 4 ft 8½ in gauge in New South Wales and supported Higinbotham in Victoria. Whitton was not one for niceties. Herewith his response to one of Fairlie's swipes at his reputation. "It sickens me to see intelligent communities to be led by the nose by persons whose sole object of maintenance of a wasteful system seems to be to make inordinate profits for somebody, or to impede the traffic of a whole country, which they are willing to do for their own pitiful ends."

CHAPTER 8. *A Portent of Doom.*

The first two break-of-gauge locations in Australia had little immediate impact. The first was at Evandale Junction in Tasmania. The second was at Kadina in South Australia. The Cousin Jacks were the Moonta miners who had come from Cornwall and brought with them stories of piskies and tommyknockers who had an arcane underground existence and warned the miners of dangers underground. They could also cause mischief if things were not to their liking. Maybe they could see what havoc would descend upon the country with the coming of the break-of-gauge, but when His Excellency arrived at Kadina by special train to open the railway, these mysterious creatures from the deepest underground workings let it be known that they were most displeased.

CHAPTER 9. *Crying Over Split Milk.*

Hamley Bridge was the first break-of-gauge that brought with it the chaos that had long been anticipated. Just when it seemed that things couldn't get any worse there was Terowie to deal with. The Engineer-in-Chief had chosen Balaklava as the break-of-gauge station, because there was plenty of space and level ground. But there were some in Parliament who were more concerned with the constituency of Port Wakefield. The Balaklava break-of-gauge would have seen the wheat from the area go to Port Adelaide and not to Port Wakefield. So, the Government disregarded the recommendation of their Engineer-in-Chief. Hamley Bridge was a congested site between two valleys and proved to be a very unsuitable location for a break-of-gauge. At the opening of the railway between Balaklava and Hamley Bridge there was an unofficial admission that a mistake may have been made but "there was no point in crying over spilt milk". The situation at Terowie was that it became a 'one-industry town' with hundreds employed, directly or indirectly in the 'break-of-gauge industry'. To fix the gauge problem would have been to throw hundreds out of work and condemn Terowie to a ghost-town future.

CHAPTER 10. *Bordertown Both Ways.*

There was a narrow-gauge network in the south-east of South Australia. It was deliberately run as close as possible to the border with the intention by South Australia of enticing trade from Victoria. Victoria responded to this with differential rates. The terminus of this network was at Bordertown which was reached by a roundabout route. Then the long running tensions between South Australia and Victoria briefly entered a truce because the fast transit of the English mails demanded their concurrence. The broad-gauge intercolonial railway met the narrow gauge at Bordertown. Serviceton became a break-of-gauge station. Then the two colonies resumed their sparring and rate wars. There was a very interesting outcome. In 1892 the South Australian Attorney General was C C Kingston and instructed the Commissioner of the South Australian Railways to advertise discounted rates for

farmers in western Victoria to send their produce. By this time the rate wars between the colonies had become quite fierce, particularly in the Riverina. The South Australian farmers made quite a ruckus that they had to pay more. There was the inevitable inquiry at which the evidence given by Kingston was entirely out of step with the evidence by the Railway Commissioner. Richard Baker was the President of the Legislative Council and supported the Commissioner. Kingston was enraged and sent a loaded pistol to Baker, with instruction to meet in Victoria Square and declared that he would either shoot or be shot.

CHAPTER 11. *The Train to Montezuma.*

Tasmania has had more railway gauges than any other colony. But it is the only colony/state that has not had any 4 ft 8½ in gauge. In the 1890s there was mining activity centred on Zeehan. By this time the 3 ft 6 in gauge was well established in Tasmania but even that proved to be too wide for the terrain of the west coast, where there were curves as sharp as 1½ chains. The North-East Dundas tramway was built to the Montezuma mine with a gauge of 2 ft. Meanwhile there was a new generation of politicians in Victoria who had not learnt the lessons of the past and eyed the 2 ft gauge in Tasmania to be the answer to their needs for cheap railways.

Almost as an afterthought they changed the gauge of their new narrow-gauge line to 2 ft 6 in. The Commissioner of the Victorian Railways was Mathieson who was against this development, but the members of Parliament got their way. Mathieson was proved correct. The lines operated at a loss, and worse still, any attempt to have them operate more efficiently by increasing the traffic only resulted in greater losses. But there would not be a railway enthusiast in the land who would not respond with a warm feeling deep inside, watching the children aboard the one surviving 2 ft 6 in gauge line. Puffing Billy.

CHAPTER 12 *'Nuts & Bolt's People.*

There are two types of people. There are the ones who fix things with nuts and bolts; and there are the others who fix the paper. In 1889 Sir Henry Parkes delivered what is now called his Tenterfield Oration. It was a call to Federation based on the shortcomings of the colonial defences, and the need for a unified railway gauge to transport the troops and armaments that would be needed to respond to any hostility. 10 years later the colonies were nearly ready to vote (some colonies more than others) Section 51 was the part of the constitution that listed all the functions that would become Commonwealth instrumentalities. There was currency, the Post Office, statistics, lighthouses, and many more and importantly, of course, defence. But not the railways. There is little doubt that if the railways had become a federal entity, the gauges would have been sorted out long ago. So, what went wrong? This is the longest chapter in the book. It was the intercolonial railway links in the 1880s and 1890s that had facilitated travel between the colonies and as the mixing of populations proceeded, the notion of not proceeding with Federation was almost anathema. But the railways were then dumped. Where it went wrong was that the 1897 Constitution Convention was dominated by those who fix things on paper, but what was needed was in the nuts and bolts department. I believe that my research has been far deeper than any previous researcher has done on the failure of the fathers of federation regarding the railways.

CHAPTER 13. *The Train from Spain.*

As early as 1846 the Great Western Railway in England announced that all efforts at gauge-changing trucks had failed. But it has not stopped the inventors and still they come. This is really a South Australian story, because it was the only colony that had break-of-gauge stations within its boundaries in the 19th century. The latest is the 'Train from Spain' which the Spanish have offered on loan so that the people in the Adelaide Hills community of Mount Barker can escape the congested freeway. This train can shift between broad gauge and standard gauge in minutes. Now, standard gauge is 4 ft 8½ in all over the world, but when the Spanish are talking 'broad gauge' and Australia is talking 'broad gauge' they ain't the same. This chapter will include bogie exchange that has been useful but is not the whole answer. There have been some innovations that have filled the need in specific situations. There was the piggyback train in 1955-56 to shift the Leigh Creek coal.

CHAPTER 14. *The Curse of the North-South Transcontinental Railway. Part 2.*

The short version is that South Australia had expected the Commonwealth to promptly complete the north-south transcontinental railway. South Australia became very obstructive in its dealings with the Commonwealth in relation to gauge matters. The construction of the other transcontinental railway required some determination regarding the 4 ft 8½ in gauge being mandated as the national railway gauge. Most States agreed but South Australia couldn't. In 1923 Premier Barwell made known that there would be one inch of standard gauge until the Commonwealth honoured the deal. He became quite paranoid about the standard gauge coming anywhere near Adelaide. In the 1930s, Premier, Sir Richard Layton Butler* weakened and let the standard gauge come a little closer to Adelaide, at Port Pirie. We haven't yet finished with the Curse of The North-South Transcontinental Railway. We will meet it again in chapter 18. Our present Federal Minister of Health, Hon Mark Butler, is a grandson of Sir Richard but is on the other side of politics. His great grandfather on his mother's side was a proud unionist and locomotive driver who has as special place in history as the man who named *The Ghan*.

CHAPTER 15. *The Shameful Case of Pinnaroo and Other Border Railways.*

There was a time when trains travelling between Victoria and South Australia could use this route and there is an unconfirmed report that even *The Overland* has once been sent through Pinnaroo. But the old colonial mentality has prevailed and whilst the line has been converted to standard gauge the two ends are not connected. We also deal with the disgraceful situation regarding the railway from Victoria into Mount Gambier. Deniliquin and Tocumwal are also explained. And there were the border lines that never linked up, like Goondiwindi and Boggabilla. And the railway from Port Augusta to Hay.

CHAPTER 16. *Locomotive Matters.*

Having a railway network with two gauges brings about inefficiencies with locomotives and rolling stock in that there must be at least one locomotive of each gauge at the break-of-gauge station for shunting and there is a doubling up of rolling stock. This chapter also looks at gauge conversion of engines and rolling stock and the design of steam locomotives that could be converted from one gauge to another. We meet Herbert William Garratt.

CHAPTER 17. *On the Defensive.*

There has been a recurring theme in Australia, that has acknowledged we have a gauge problem and the reliance on only one mainline linking the mainland capitals is a weakness in our national defence. The response has been much along the lines that “we’ll worry about that when it happens”. And when the nation has been under threat, either by good luck, or good allies, we have pulled through. To which the response has been that, “We have got through OK, so we don’t need to worry about it.”

CHAPTER 18. *The Curse of the North-South Transcontinental Railway – Part 3.*

We have not yet finished with the saga of the curse of that railway. The Commonwealth made an attempt at a peace deal with South Australia which involved the construction of the railway from Oodnadatta to Alice Springs, which was completed in 1929. South Australia reneged on the part about completing the direct route from Port Augusta to Adelaide.

CHAPTER 19. *The Decade of Lost Opportunities.*

The 1920s. The Garvan Royal Commission. W A Webb and the Western system of the SAR. Victoria’s opposition to the recommendations of the Royal Commission. Axle loading. Brisbane.

CHAPTER 20. *The Clapp Report and the Prophecy of Santayana.*

Santayana was a Spanish American philosopher. His prophecy has had a number of variations but is essentially: **those who fail to learn from the errors of history are doomed to repeat them.** Sir Harold Clapp disregarded the lessons of history. This is a fairly short chapter, but it packs a punch. The message that it sends is that from reading this chapter and taking into account the contents 20 chapters before it, there are four lessons.

Lesson 1. The states are unable to see beyond their borders. If we are going to fix this gauge problem we have to erase borders from the railway map of Australia and things need to be directed and paid by the Commonwealth in a spirit of bonhomie.

Lesson 2. Most previous attempts have fallen apart from want of decent planning and co-ordination.

Lesson 3. The failure to fix the gauge problem has chronically rendered the South Australian network inefficient and uneconomical to the extent that it has disintegrated. If the other states do not act, they will follow South Australia and their rail enterprises will disintegrate. I see Victoria as being very vulnerable.

Lesson 4. The failure to heed the lessons of history.

CHAPTER 21. *Uncle Tom.*

Thomas Playford (later Sir Thomas Playford) was South Australian Premier from 1938 to 1965. He was an astute negotiator, and his favorite ploy was to take on the Commonwealth and walk away with special financial deals that left the other states dismayed. It was a tactic that involved some connivance with another South Australian politician, Senator George McLeay. In 1949 Playford stitched up two deals that were in the name of standardisation. The legacy from that is there is not one inch of the present operating railway map of Australia to show for it. The Commonwealth paid to have the narrow-gauge lines of the South-East (Mount Gambier) converted to broad gauge 5 ft 3 in. The agreement was that South Australia would convert those lines to standard gauge at its own expense when the connecting lines were converted to standard gauge. That should have been in 1995 but the broad-gauge line to Mount Gambier remains a disconnect and South Australia has shown no

indication of its intention to honour its part of the deal. The Leigh Creek coal line with its extension to Marree was the other. There is 6-page tabular chronology that looks at the politics of standardisation in the Playford era, and a bit before and after.

CHAPTER 22. *Mr Fitch Says.*

Mr Fitch was the Commissioner of the South Australian Railways in the late 1960s to mid 1970s. During his tenure the line from Broken Hill to Port Pirie was converted. Bob Sampson began his railway career in the early 1970s as a youth porter with the South Australian Railways at a time when Ron Fitch was Commissioner. Bob has been the Executive Officer of the National Railway Museum for many years. Ron Fitch had a long and productive retirement and lived to be over 100, and there developed a unique bond between the two. There were many discussions about the standardisation of the Broken Hill to Port Pirie line. Ron Fitch advocated for the standard gauge into Adelaide as part of that project. This chapter also considers the various forces that worked for and against the standard gauge conversion of the Port Pirie to Broken Hill line.

CHAPTER 23. *It's Thru and It's Time.*

On 3 January 1962 the standard-gauge diesel burst through the banner in Melbourne that had the slogan **It's Thu**. There were celebrations in anticipation of rail dominating the Sydney to Melbourne route but it has not happened and the amount now sent by rail is about 5%. In 1968 Federal Opposition leader, Gough Whitlam announced his scheme for a National rail network which would be forged out of the State networks coming under Commonwealth ownership. In the lead-up to the 1972 Federal election, Labor had rallied under the banner of **It's Time**. Gough Whitlam's Australian National Railways was well short of what was necessary to achieve the efficiency needed and it could only survive with funding. There were four major construction and gauge conversion projects during this time. Tarcoola to Alice Springs. Adelaide to Crystal Brook. Melbourne to Adelaide gauge conversion. There was survey and preliminary work done for the Darwin line. The Melbourne to Adelaide conversion was underfunded. The lines to Mount Gambier and Pinnaroo became disconnected and are no longer in use.

I had been faced with the decision as to where I should end this story. Now is not a happy place with major cost blow-out and uncertainty about the final direction of the Inland Rail. There has also been delay and indecision in Victoria. Australian National was dismembered about 1997/8 after which the rail industry has become fragmented to the extent that it has been difficult to be *au fait* about the present state of the railways. So, it makes sense not to go there.

We have had three chapters about *The Curse of the North South Transcontinental Railway*. That curse has been lifted as of 1 February 2004 when the first train departed Adelaide for Darwin. That seemed a good place to end the story.

CHAPTER 24. *The Epilogue.*

I traditionally write the Epilogue the day before I go to the printer. There will be some comment about the Inland Rail project and Victoria's Murray Basin.

There is one **APPENDIX** item. Des Smith has produced a private publication **TRACKS ACCROSS AUSTRALIA – 44 years in Railway Engineering on the East West and North-South Transcontinental Railways. June 2022**. There are 124 pages of which 7 relate to concrete sleepers. Des believes that his most significant contribution to the rail industry had been the concrete sleepers. He has kindly granted permission for those 7 pages to be included in this book.

There will be a Bibliography and an Index.

The book will be about 220 pages, A4 format with hard cover, extensively illustrated with colour throughout.