From the Western Front to the Queensland Canefields

Thousands of narrow gauge locomotives were used by the French, German, British and American military in France and Belgium in World War I. Some of them found their way to the canefields of Queensland and some have survived to the present day.

The presentation will look at the background to the light railways used in the war, how they were essential to waging trench warfare, and some of the equipment that featured on them. Post-war disposal and the subsequent use of some of the locomotives in Queensland will be covered. The stories of the surviving Queensland locomotives will be featured including those now at the Australian War Memorial, the Workshops Rail Museum, Dreamworld, and the one recently restored to running condition in England.

THE BACKGROUND TO "2ft gauge" (600mm/610mm)

The first successful 2ft gauge locomotives were introduced on the Festiniog Railway in north Wales from 1863. Fairlie patent double-ended locomotives were introduced in 1869. The work of Decauville in France and Fowler in England led to the widespread adoption of 2ft gauge steam locomotives in industrial and light railway applications worldwide from the 1880s, including sugar mill tramways in Queensland.

The Western Front was the largest even concentration of narrow gauge operations in history with something like 9,000 locomotives, steam and internal combustion, having been delivered there.

MILITARY APPLICATIONS – THE FRENCH AND GERMANS

The French military developed the concept of siege narrow gauge railways to support the artillery at border fortresses such as Verdun by ensuring that shells could be delivered in a timely manner and in sufficient quantity. A military engineer, Colonel Péchot, designed 600mm gauge locomotives and roiling stock for this application in association with Decauville, notably the small (10 ton empty) 044-0T Péchot -Bourdon Fairlie type locomotive of 1888. About 60 of these had been built by the start of the war. 295 more were built during the course of the war and used to support the static trench lines of the Western Front. Only two survive.

The German army was very interested in what the French were doing and quickly came up with their own design of 600mm gauge locomotive for military light railways. This was the *Zwilling*, a pair of small (each 7 ton empty) 0-6-0T locomotives arranged to work back-to-back but with the flexibility to be operated separately. By 1904, 182 pairs had been built, with many used in a colonial war in Namibia. The Japanese also purchased 180 which were mostly used in their invasion of Korea. A single unit of this type survives, in Namibia.

The German experience in Namibia led them to realise that 2ft gauge military railways could be useful not just for static siege works but to transport supplies within substantial areas of territory. With an eye on the little-developed expanses of Poland and Russia to the east, the Germans developed a further design of locomotive. This was a 10 ton (empty) 080T with an ingenious and robust flexible wheelbase arrangement by which the outer wheelsets were contained within hollow axles. About 160 were built up to the outbreak of war and held in preparation for a future conflict.

The American author Roy Norton encountered one of the German storage depots in 1914.

"I was in Cologne, and blundered, where I had no business, into what I learned was a military-stores yard. Among other curious things were tiny locomotives loaded on flats which could be run off those cars by an ingenious contrivance of rails. Also there were other flats loaded with sections of tracks fastened on sleepers and sections of miniature bridges on other flats. I saw how it was possible to lay a line of temporary railway, including bridges, almost anywhere in an incredibly short space of time, if one had the men".

During the war the incredible number of more than 2300 of the 0-8-0T locomotives were constructed. About 100 of these survive in more than 15 countries.

World War 1 was a huge boost for the development of the internal combustion engine. Both French and Germans used large numbers of internal combustion locomotives on their military narrow gauge railways. The Germans had about 1000 and the French more than 800, including 200 large petrol-electric bogie locos.

Both Germans and French made extensive use of light railway equipment for supply purposes on the western front. The idea of rapidly laying down

prefabricated track panels to establish communications in newly-captured areas had little application once the front settled down to a static attritional state. It was soon discovered that semi-permanent lines using ballast and wooden sleepers offered better results. When the front line did move, narrow gauge track could be laid rapidly and it was sometimes found convenient to connect into the enemy's captured rail system. Under attack, the challenge was always to try and withdraw locomotives and rolling stock to safety in the rear, or failing that to destroy as much of it as possible. An explosive charge in the firebox was the crude method immobilising locomotives although the removal of vital components was a less brutal approach. Each side used equipment captured from the other.

THE BRITISH

Before the war, the British ignored these continental developments and continued to do so for some time into the war. They had chosen a gauge of 18 inches for home establishments and 2ft 6in for temporary military railways to be used in colonial wars. The Expeditionary Force in France relied upon road vehicles for mechanised transport, although horses and mules were the predominant method. Plans were executed for the commandeering of substantial numbers of commercial road vehicles, both trucks and buses, for use by the Expeditionary Force in France.

The experience of warfare on the Western Front in 1915-1916 changed British attitudes towards transport. The immense quantities of shells required for the artillery exceeded all previous projections. Heavy traffic, wet weather and the breakdown of drainage led to impassable conditions for road vehicles. Experience of using French light railway equipment in a sector taken over from them in late 1915 helped the British to realise that light railways made a useful contribution to the effective waging of war. From early 1916, initial orders for 600mm gauge locomotives and rolling stock were placed. The need to improve transportation was emphasised with the start of the Battle of the Somme in mid-1916. 20,000 tons of supplies were required daily to support the offensive on a 20km front and the existing modes of transport were simply unable to cope, exacerbating a shortage of ammunition supplies.

A review of transportation by a senior British railway official working for the Ministry of Munitions in 1916 recommended wholesale changes to the entire supply chain. This included the establishment of Light Railway Operating Companies, including one from Australia, to run 2ft gauge railways that were to connect main line railheads with the supply areas behind the fighting front. By the end of the war the British had constructed more than 3000 kilometres of new narrow gauge lines. These lines largely accommodated the natural contours of the ground, but there were some impressive bridges to cross watercourses. About 600 narrow gauge steam locomotives and more than 1000 internal combustion locomotives had been delivered to the British forces in France by the end of the war. There were also more than 15,000 items of rolling stock delivered, mostly four-wheel and bogie open wagons.

The main type of steam locomotive ordered by the British was a 4-6-0T that weighed 11 tons empty. 115 of these came from the Hunslet Engine Company of Leeds and 495 of an entirely different design came from The Baldwin Locomotive Works in the USA. It took Hunslets 29 months to build their 115 while Baldwin turned out their 495 in 7 months. An improved 2-6-2T design from Alco accounted for another 100 locomotives. The most numerous British internal combustion locomotive types same from Motor Rail at Bedford. More than 750 of these were a 2½ ton 20hp type while 220 were heavier 40hp types equipped with a degree of armour plating.

On entering the war, the Americans also invested in narrow gauge light railway equipment. Much of it was not delivered until after the war. Those that were delivered before the end of the war came from Baldwin - included 195 2-6-2T steam and 189 petrol locomotives.

In brief, the system of operations was that steam locomotives and the larger internal-combustion locomotives brought supplies from the standard gauge railheads around 15 kilometres from the front to transfer yards about 6 kilometres behind the lines. The small internal combustion locomotives then brought the supplies forward another 3 kilometres or so to the supply dumps situated behind the front line.

The light railway systems were very effective in meeting transport needs in forward areas, largely operating under cover of darkness. They carried huge quantities of construction materials, fuel and

animal forage as well as ammunition and general stores. Large quantities of salvage and many wounded were carried away. The peak traffic in 1917 was 200,000 tons per week. Unsurprisingly the light railways also carried active troops whenever this could be arranged, officially or unofficially. There were dedicated Operating Units that included many professional railwaymen, and elaborate systems of train control. Centralised workshops performed maintenance. Lines damaged by enemy action were speedily repaired. Locomotives and rolling stock were sometimes damaged by shellfire and operations beyond the transfer yards often hazardous.

Following the breakthroughs of August 1918, the light railways could not be extended quickly enough to keep up with allied advances. When the war finished, vast amounts of British war materiel was shipped back to the UK for disposal, including large numbers of new or used narrow gauge locomotives.

TO QUEENSLAND

The Hunslet locomotives were the most sought after and found their way to many places worldwide, including 26 to Argentina. The Queensland Government purchased 11 between 1920 and 1925 for use on QR's Innisfail Tramway and five sugar mills it controlled. Four more came to farmer-controlled or private mills with another of the same design built new in 1925. In addition, three Baldwins were obtained for farmer-controlled mills. The most extraordinary acquisition did not occur until 1940 when one of the USA Army Baldwins, purchased for use at a Welsh slate quarry and found to be unsuitable there, arrived in Bundaberg.

Having been built to run on light track with a maximum axleload of 3½ tons, these locomotives were found to be somewhat light footed for the slogging haulage of heavy loads of sugar cane. However, most remained in service at least until the 1950s and seven survive today - five Hunslets, a British Army Baldwin and an American Army Baldwin.

Two of the large Motor Rail petrol locomotives found their way to Queensland sugar mills. Another five of the smaller ones, built after the war from stockpiled parts, came to Australia and three of these survive.

THE AUSTRALIAN STEAM SURVIVORS

Hunslet **WDLR 306**, the sixth built, came to Gin Gin Mill at Wallaville in 1924. It was sold for scrap in 1967. It was obtained from a private owner by the Australian War Memorial in 2001. By early 2004 it had been extensively restored cosmetically in Canberra in its World War I guise and was on display in the War Memorial's ANZAC Hall for a number of years. Currently it is in the War Memorial's storage annexe.

Hunslet **WDLR 327** came to North Eton Mill near Mackay in 1920. After being withdrawn from service in 1964 it was plinthed in the open at a nearby park as a War Memorial. Its deteriorating condition led to its removal in 1999 and Mackay Sugar arranged for it to come to the Workshops Rail Museum in Ipswich in 2005. Cosmetic restoration commenced in 2012 and in 2018 it went on display in the museum, again in World War I livery.

Hunslet **WDLR 303** came to Bingera Mill near Bundaberg in 1924. It remained in service until 1956 when it was sold to the Invicta Mill at Giru. At Invicta Mill it received the cab and side tanks from that mill's worn out Hunslet and continued in service until 1964. In 1967 it was placed in the beachside playground of the Bush Children's holiday home in Townsville until being rescued by a local collector in 1994. In 2005 it departed for the UK having been acquired by the War Office Locomotive Trust. Its export was allowed under Australian cultural heritage laws because of the two other examples already in public collections in Australia. Restoration to working order commenced in 2012 and took six years to accomplish by a volunteer team at a base in north Derbyshire. It included the construction of a new boiler by a contractor. The locomotive made its working debut in June 2016 and was a magnificent sight. It will be based at the Apedale Valley Railway in Stoke-on-Trent.

Hunslet **WDLR 328** came to South Johnstone Mill in 1925 and was out of use by 1950. It gained a new lease on life when on 29 October 1956, a QR passenger train collided with one of Cattle Creek Mill's Hunslets at the diamond crossing at the mill. The damage was such that it was made sense for Cattle Creek to obtain the locomotive remains from South Johnstone and refurbish it with parts salvaged from their locomotive. In this form it continued in service until 1965. It was donated to the Australian Narrow Gauge Railway Museum Society and currently awaits restoration at Woodford.

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Hunslet **WDLR 2345** was delivered too late to go to France. It was sent directly to a disposal site in Essex and from there came to Proserpine Mill in 1920. It was out of use in 1959 and placed in a local park. Rescued in 1997, it has been on display inside the Proserpine Historical Society Museum since 2003.

Baldwin **WDLR 624** was purchased by Racecourse Mill in 1924 for a projected tramway at Silent Grove Tramway at Mount Ossa. The line was not built until 1926 and at that time was the mill's only tramway. The locomotive had difficulty on the steeply-graded line and the tanks were moved back as far as possible to increase the weight on the driving wheels. In 1936, it was brought to the tramway that had been built to connect directly with mill and, fitted with a tender, was better suited to the flatter lines it worked on there. It was out of use by 1955 and was obtained in 1972 for use at the Dreamworld theme park, then being planned. It was rebuilt in Sydney as an oil-burning tender engine and started work when Dreamworld opened in 1981. It has been little used since 2013 when a fake steam locomotive arrived at Dreamworld from Italy.

Baldwin **USATC 5104** arrived in France at the very end of the war. In 1924 it came to the Penrhyn Slate Quarries in north Wales where it was named FELIN HEN. It was found to be unsuitable for use there and was laid aside in 1927. In 1940 it was purchased by Fairymead sugar mill at Bundaberg. It was rebuilt as an 0-6-2T in about 1953. Placed in a park in 1967, it deteriorated badly and in 1978 was removed into the care of the then Bundaberg Tourist Tramway Preservation Society (now the Australian Sugar Cane Railway). After an unsuccessful attempt at restoration it was reduced to bare remains stored in the loco shed at the old Qunaba Mill. In 2002 it was acquired by French enthusiast Patrick Mourot and moved to his site south of Paris. Here it was resurrected to its original form as a 2-6-2T, returning to steam in 2011.

With the centenary of the Great War, these locomotives became more widely known and models made available commercially in a number of scales. There is now an extensive bibliography of sources dealing with the light railways on the Western Front, and more are on the way. Modelling the western front and Queensland cane railway operations has become more popular so these interesting narrow gauge locomotives certainly have a place.