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War Department Light Railways of the First World War

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This paper recounts some experiences on the Western Front of two men who had worked at the Ipswich Railway Workshops before the First World War. Lt. Colonel A. C. Fewtrell , who trained as a cadet engineer at Ipswich Railway Workshops, and was involved in the operations of a light railway unit on the Western Front presented a paper about his experiences to some graziers in New South Wales in 1920. Major S. H. Hancox had been in charge of the powerhouse at Ipswich Railway Workshops before enlisting and being sent to France where he worked on the construction of a section of the 60 cm gauge light railways during 1917. Hancox relates some of the horrific conditions he encountered through letters to his mother in Brisbane.

In 1916, the British adopted the 60 cm gauge light railway system which was already being successfully used by both the Germans and the French. The British introduced the Hunslet 4-6-0T locomotives, many hundreds of other steam and early internal combustion locomotives as well as thousands of wagons providing a solution to maintaining the necessary supplies to the front lines.

Following the end of the War, fifteen Hunslet locomotives built for use in France came to Queensland for use in the sugar industry. Hunslet Engine Company Works Number 1239, delivered to France in late 1916, was one of those Hunslet locomotives. We briefly follow the history of No.1239 after its delivery to Australia in 1920 and donation to the Queensland Museum in 2005.

❑ War Department, light railways, trench warfare, British, German, Hunslet, Simplex, Decauville

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PRELUDE TO CONFLICT

When War was declared in 1914, Britain and her allies thought the war would be a fast moving conflict and that the war would soon be over. The initial battles of 1914 changed that idea when by late 1914 the opposing sides dug in and the trench warfare costing tens of thousands of lives extending over four years began (Roden 2014, p. 108).

The French adopted a 60 cm gauge portable light railway system originally invented by a French agriculturalist, Paul Decauville, in 1888 to service their military fortifications in northern France. The Prussian military also began development of their own 60 cm gauge light railway systems for military purposes in the same year (Wright 2014, p. 187).

PORTABLE 60 CM GAUGE LIGHT RAILWAYS

Prior to the War, the Germans stockpiled vast quantities of 60 cm gauge light railway equipment, including track panels, locomotives and rolling stock. A training program was also implemented to teach specialist engineers and military personnel the skills necessary to lay the track quickly and to operate a light railway system to provide a means of communication and supply for their military forces. These large stockpiles and the training regimes were observed and commented on by visitors to Germany in the months prior to the breakout of war but no-one seemed to pay much heed.

Roy Norton, an American writer wrote of his observations on 14 February 1914 –

> While in Cologne, I blundered, where I had no business, into what I learned was a military stores yard. Among other curious things were tiny locomotives loaded on (standard gauge) flats (wagons) which could be run off those cars by an ingenious contrivance of metals, or, as we call them in America, rails. Also there were other flats loaded with sections of tracks fastened on cup ties (sleepers that can be laid on the surface of the earth) 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.....Before I could conclude my examination, I discovered that I was on verboten ground; but the official who directed me out told me what I had seen were construction outfits. (Roden 2014, p. 31–32)

During their planning, prior to war being declared, the German military had considered the possibility of a slow moving conflict requiring the provision of a reliable transport system utilising their 60 cm gauge light railway equipment. The Germans violated the neutrality of Belgium on 4 August 1914, and crossed into France making rapid advances outflanking the French army and their fortifications which only covered the section of border facing Germany (Roden 2014, p. 46).

Mr H. Teasdale Smith a South Australian engineer and contractor, approached the British military through the Australian authorities less than two months after war broke out. He offered his services, at no cost, to go to France with the aim of constructing light railway track behind the front lines to act as supply lines. The British would be required to supply the labour and material. Teasdale Smith offered to lay track at the rate of ten miles per day. He explained he had had extensive experience in the construction of railways (including light railways) across Australia especially in Western Australia and South Australia. He considered that such a system of light railways linking to standard gauge railheads would assist the British and French in transporting men, ammunition, field guns and supplies. However, his offer was politely declined and subsequently ignored by the British military (*Sydney Morning Herald*, 10 April 1916, p. 5).

Following battles along the River Marne the German advance was halted and they were forced back a short distance north to the River Aisne. By late 1914, both sides had dug in marking the beginnings of the ensuing trench warfare which lasted until 1918 (Davies 1966, p. 16).

The Germans now made use of their Feldbahn ('Field Railway') military light railway systems. They established a network of 60 cm gauge light railway in order that supplies could be maintained to their troops in the front line trenches. The Germans demonstrated their ability to lay out their rail lines quickly and adapt them as circumstances changed. It was found that the 60 cm gauge field railways could be laid to approach the front lines much more closely than a standard gauge line. A distance of six miles was considered to be the nearest to the front lines that a standard gauge line could be located with some degree of safety although even this was within range of heavy artillery (Roden 2014, p. 169).

Aerial photographs of the countryside behind the German lines revealed a network of light railways leading right up to the trenches demonstrating the German reliance on this system of transport communication (*Sydney Morning Herald*, 10 April 1916, p. 5).

BRITISH TRANSPORT DIFFICULTIES

The British military had decided to use wagons drawn by horses and motor trucks utilising the available road network to maintain the necessary supplies to their military. However, motor trucks of the period were slow and unreliable as well as having a small carrying capacity – generally of about 3 tons. Their solid rubber tyres proved devastating to the primitive road network and added to this they could not be driven across country (Roden 2014, p 167).

The condition of the roads adding to its other transport difficulties encouraged Britain to reconsider their transport priorities. The British had a small quantity of 2 ft 6 in gauge light railway material in England purchased before the War but the French had standardised on using 60 cm gauge in northern France. They persuaded their British allies to also settle on the 60 cm gauge for their light railway systems in France rather than adding yet another track gauge to the standard, metre and 60 cm gauge systems already in operation. The 2 ft 6 in gauge material was instead sent to the Middle East for use there (Davies 1966, p. 18).

Eric Geddes had had extensive experience in railway operations in the United States and India before joining the North Eastern Railway Company in England in 1904. He was promoted to the position of Deputy General Manager of the North Eastern Railway in 1911. During 1915, because of his extensive experience in rail operations and the movement of large quantities of goods, Geddes was invited by the British government to investigate rail facilities with respect to ammunition supply in France. In 1916, he was appointed Director General of Transportation in France. Following his extensive investigation Geddes recommended the British adopt the French Decauville 60 cm gauge light railway system (Roden 2014, p. 203).

BRITISH ADOPT THE 60 CM GAUGE

The light railway systems adopted by the British on the Western Front had been brought about by necessity. Winter conditions in 1915–1916 while not especially severe did cause disruption to transport while the winter conditions in 1917 were particularly severe. The rain and snow combined with the constant traffic from the early motorised road vehicles and horse-drawn wagons soon tore up the few existing roads bringing traffic almost to a standstill. The mules and horses were sinking up to their knees in the mud and had to be pulled out with the help of military personnel and other horses. Exposure in the harsh winter conditions was also causing the death of many animals. The situation was so extreme that it could mean all the horses under Australian control would have ceased to exist within a fortnight (*The Sydney Stock and Station Journal*, 1920).

When the British took over two operational French 60 cm gauge railways early in 1916 they found that the locomotives available were not suitable for longer distance 'main line' operation. The French had a mixed collection of small steam locomotives mainly built by French light railway manufacturer, Decauville. The largest steam locomotive they had in use was the unusual double-ended Pechot-Bourdon weighing 12 tons in working order with a 0-4-4-0T

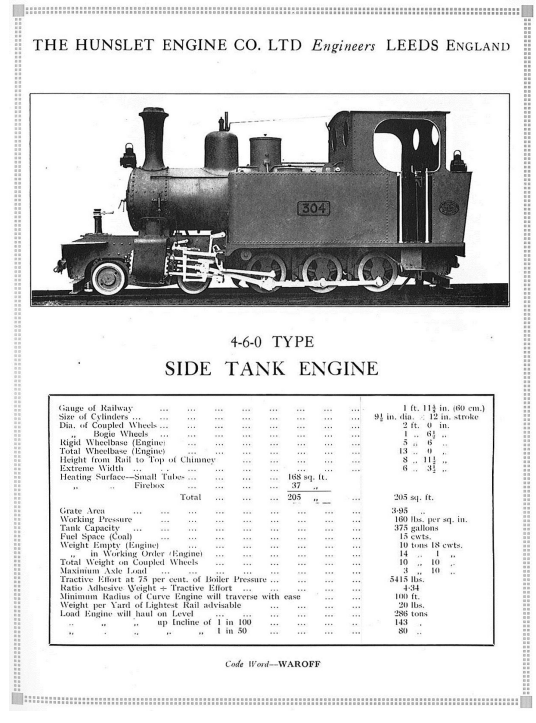
wheel arrangement. The British required a larger, heavier locomotive than the small 6 and 8 ton 0-6-0 tank type initially available. These locomotives had been intended for shunting around workshops and supply dumps on the French artillery railways serving static fortifications along the border with Germany. The new locomotives would still be constrained by the limits of the axle loading on the light track being used (Davies 1966, p. 151).

NEW LIGHT RAILWAY EQUIPMENT

Tenders were called by the British War Office for the supply of a locomotive to suit conditions on the Western Front. Many of the potential suppliers were already heavily involved in war work and unavailable to take on the additional work. The tender of the Hunslet Engine Company of Leeds offering a variant of a 0-6-0 design they had previously supplied to a South African customer was accepted. The frames were extended and a 4-wheel leading bogie added allowing a coal bunker to be fitted behind the cab. This enabled the locomotive weight to be spread over a greater distance allowing their use on the light track to be found on the Western Front (Davies 1966, p. 141) (figure 1).

HUNSLET 4-6-0T LOCOMOTIVES

In March 1916 an order was placed with the Hunslet Engine Company for 45 locomotives and a further 30 were ordered in August. Unfortunately, the manufacturing capacity at Hunslet's plant in Leeds was severely strained and they were unable to maintain the supply of locomotives at the required rate. A total of 115 of these 4-6-0 tank locomotives were ordered from them up until January 1918. The first 27 were delivered to France between August and November 1916 with Works Number 1239 the last to be despatched leaving Leeds on 16 November. It took a year to supply the first 75 locomotives that had been ordered with delivery of the remaining orders not completed until late 1919 well after the war had ended. Many more locomotives were needed for the war effort in France as soon as practicable (Davies 1966, p. 144–145).



THE HUNSLET ENGINE CO. LTD *Engineers* LEEDS ENGLAND

4-6-0 TYPE

SIDE TANK ENGINE

Gauge of Railway		1 ft. 11½ in. (60 cms.)
Size of Cylinders		9½ in. dia. × 12 in. stroke
Dia. of Coupled Wheels		2 ft. 0 in.
,, Bogie Wheels		1 ,, 6½ ,,
Rigid Wheelbase (Engine)		5 ,, 6 ,,
Total Wheelbase (Engine)		13 ,, 6 ,,
Height from Rail to Top of Chimney		8 ,, 11½ ,,
Extreme Width		6 ,, 3½ ,,
Heating Surface—Small Tubes	168 sq. ft.	
,, ,, Firebox	37 ,,	
Total	205 ,,	205 sq. ft.
Grate Area		3·95 ,,
Working Pressure		160 lbs. per sq. in.
Tank Capacity		375 gallons
Fuel Space (Coal)		1·5 cwts.
Weight Empty (Engine)		10 tons 18 cwts.
,, in Working Order (Engine)		14 ,, 1 ,,
Total Weight on Coupled Wheels		10 ,, 10 ,,
Maximum Axle Load		3 ,, 10 ,,
Tractive Effort at 75 per cent. of Boiler Pressure		5415 lbs.
Ratio Adhesive Weight ÷ Tractive Effort		4·34
Minimum Radius of Curve Engine will traverse with ease		100 ft.
Weight per Yard of Lightest Rail advisable		20 lbs.
Load Engine will haul on Level		286 tons
,, ,, ,, up Incline of 1 in 100		143 ,,
,, ,, ,, ,, 1 in 50		80 ,,

Code Word—WAROFF

FIG. 1. WD Hunslet 4-6-0T specification sheet. Image courtesy D J Mewes.

The Hunslet locomotives weighed 14 tons in working order. They were 19ft 11in long, 6ft 3½in wide and 8 ft 11½ in high. The cylinders were 9½ inch diameter by 12 inch stroke with 24 inch diameter driving wheels and the leading bogie wheels 1 ft 6½ inch diameter. Recommended minimum weight rail was 20 lbs per yard. The minimum radius curve the locomotive could traverse was 100 ft. The load the locomotive would haul on the level was 286 tons which was reduced to 80 tons on a 1 in 50 grade (Hunslet Engine Co. Ltd., Specification Sheet).

Since the Hunslet Engine Company was unable to supply their locomotives within the required timeframes and in the quantities required, the British War Office placed an order with the Baldwin Locomotive Works in the United States for 45 locomotives to a design similar to the Hunslet s in that they were also 4-6-0 tanks weighing just over 14 tons. Further orders were placed – 350 ordered in September and another 100 in November 1916.

Except for nine lost at sea during delivery, these locomotives were delivered to France by April 1917 within twelve months of the first order being placed (Davies 1966, p. 147).

The Baldwin 4-6-0T was by far the most common steam locomotive on the Western Front but they would sometimes roll over if left standing on canted track for any length of time. The water tanks were wider, and shorter than on the Hunslets and their location on the boiler created an inherent instability for the locomotive. When standing on canted track, the water in the side tanks would slowly flow to the lower side upsetting the equilibrium of the locomotive so that it would tip over off the track. Some light railway operating companies removed the water tanks and towed them on a wagon behind the locomotive to prevent this problem (Link 2014, p. 160).

Light railway companies that had Hunslet locomotives among their operational fleet considered themselves to be lucky as they were highly valued. They were considered to be strongly built, reliable and quite powerful when compared with the mass-produced Baldwin 4-6-0 tank locomotives (Davies 1967, p. 145).

In operation, it was found that both the Hunslet and Baldwin 4-6-0Ts appeared to suffer from the lack of a rear trailing truck to assist in guiding the locomotive around curves when travelling in reverse on rough track. The driving wheels occasionally had a tendency to climb the outer rail on sharp curves causing a derailment. Where possible the crews preferred to operate these locomotives in the forward direction with the four-wheel bogie leading which helped guide the locomotive around the curve. Many of the light railway systems provided a turning angle or balloon loop at appropriate locations which facilitated the operation of the locomotives in the forward direction each way rather than travelling long distances in reverse (Davies 1967, p. 150).

The British War Office requested a tender from the American Locomotive Company (ALCO) as further steam locomotives were still required. British builders were already fully occupied as was the Baldwin works. An order for 100 locomotives was placed with ALCO. They were similar in appearance to the Baldwin 4-6-0 tanks but had a 2-6-2 wheel arrangement. The order, placed in October 1916 was completed by May 1917 (Davies 1967, p. 144–151).

LT COLONEL A C FEWTRELL

Albert Cecil Fewtrell, born in Cheshire, England in 1885 came to Queensland where his father had gained employment with the State Education Department in 1886. Albert was educated in Townsville and gained a cadetship in engineering with Queensland Railways. While working at Ipswich Railway Workshops he joined a local military unit before moving to New South Wales as an engineer with the New South Wales Railways. Fewtrell was promoted to Lieutenant Colonel in January 1916 before embarking for France in February in command of a battalion of the Australian Mining Corps. On arrival in France his unit was absorbed into the British Royal Engineers and Fewtrell was transferred to command the 4th Australian Pioneer Battalion (A C Fewtrell Biography).

General Sir William Birdwood commander of all Australian and New Zealand troops from the beginning of the Gallipoli campaign, on his own initiative, ordered the commencement of light railway construction by the Australian Infantry Forces for its own purposes. While railway plant was scarce the Australians managed to have a light railway of about 25 miles in length laid within ten weeks serving as a transport system connecting to the standard gauge railheads. Birdwood placed Lt. Colonel Fewtrell in charge of the construction of this light railway system to serve the Australian forces. Men involved in the construction, maintenance and operation of the light railway were drawn from troops in the front line (*The Sydney Stock and Station Journal*, 1920).

Early in 1920, Lt. Colonel Fewtrell presented a paper to local graziers in New South Wales, in which he recounted his experiences. The light railway system built by the Australians was vital in maintaining the large tonnages of supplies required per day

including food, small arms, ammunition and shells for the heavy guns. The rail system had had to be built over soft ground that had been heavily shelled, with the work being carried out under severely adverse conditions. The light-weight rail initially supplied was of only about 16 lbs per yard with some 20 lbs rail also in use. These rails were too light for the heavy traffic required causing severe operating problems. The 2½ ton 20 hp Simplex petrol tractor was the only locomotive capable of use on these rails (figure 2). Heavier rail weights and better laid track were needed for steam locomotive operation. The Australians were great scroungers and were quick to acquire any material considered suitable. Fewtrell's men obtained varying sections of rail during construction of the line between Bazentin and Bapaume. This was generally laid with rails from 30 lbs per yard and one section even had rail 110 lbs per yard.

The sleepers under the heavy section rails were spaced at 3ft 6ins centres their dimensions being 4ft. 6ins.long, 6ins. wide, and 4ins. thick. It was found on a 1 in 30 grade that the haulage power of both steam locomotives and petrol tractors was increased by 50 per cent with the introduction of the heavy rails section as against the light-weight Decauville rail. Fewtrell reported that the track maintenance was reduced from 100 men per mile for the Decauville rail to 20 men per mile for the heavy section railways. Of course, the maintenance of these lines in war-time conditions under shell fire was much more demanding than would be the case in peace-time (*The Sydney Stock and Station Journal*, 1920).

Fewtrell continued his account of his experiences regarding the construction of the light railways and their operation. During the advance from Bapaume to the Hindenburg Line, prefabricated track panels

FIG. 2. Two 20 hp Simplex petrol tractors wait in sidings behind the trenches on the front lines while a 40 hp Open Simplex is on the right. Image Queensland Museum.

with steel sleepers and using 20 lbs per yard rail were quickly laid across the soft grass and in one section along a footpath. A 2½ ton Simplex petrol tractor was used as the line construction advanced at the rate of a mile per day. Work parties followed along this hastily laid track adding in extra wooden sleepers and ballasting enabling bigger locomotives to bring in heavier loads. This light railway system proved its worth in supporting the front line trenches by carrying food from standard gauge railheads and supply dumps. Other supplies transported efficiently by this means included heavy shells for the gun batteries, ammunition for the troops and, importantly fodder for the mules and horses and drinking water for both the troops and animals. The light railway was also found valuable enabling fresh troops to be transported to the front lines and the transfer of those troops being relieved back to rest areas. This was much easier than having to march long distances. Empty trains returning to the standard gauge railheads were also used to evacuate wounded soldiers helping to save many lives (*The Sydney Stock and Station Journal* 1920).

Fewtrell in comparing the French Decauville track panels with the Feldbahn track panels used by the Germans reported that the German track was superior. His unit had recovered about 2 miles of Feldbahn track which was incorporated into the light railway system under his control, enabling him to draw a direct comparison between the two. The German track panels were made with slightly heavier rail and the steel sleepers were both longer and wider than the Decauville track. This design spread the loading of the track over a bigger area of the soft ground ensuring better stability.

He found whilst on the Somme and in Belgium that the French Decauville track system was expensive to maintain over soft ground whilst rail with a weight of 30 lbs per yard was more suitable for the traffic required when spiked to wooden sleepers spaced at 3ft 6ins centres. Trains could then be operated at up to 20 miles per hour with a solid road bed.

Lt Colonel Fewtrell had experience with almost every locomotive type used on the light railways by the British military including the Hunslet 4-6-0, Baldwin 4-6-0 and ALCO 2-6-2, as well as Robert Hudson 0-6-0, and Kerr Stuart 0-6-0 types. The Hunslet and Baldwin locomotives weighed approximately 14 tons and could haul loads up to 110 tons on level track. The ALCO locomotives were found to be the most powerful and would track better around curves than the two 4-6-0 types as these would sometimes get into trouble on sharp curves when travelling in reverse (figure 3).

In addition to the steam locomotives in use Fewtrell was acquainted with several types of petrol locomotive. Steam locomotives were generally used between the standard gauge interchange yards to haul heavy loads to forward yards. Here wagons were shunted into smaller trains, to be hauled by the 20 hp. two-cylinder 'Simplex' petrol tractor. This type of Simplex could haul about 18 tons at 7 miles per hour on level track or 10 tons on a 1 in 30 grade at 5 miles per hour.

A 6-ton, 40 hp version was later introduced by the same builder – the Motor Rail and Tramcar Company. The 40 hp Simplex came in three versions. The basic 'Open' version had a rudimentary shielding front and rear and a roof to provide some shelter for the driver, a 'Protected' type with steel side doors providing additional protection and finally the 'Armoured' type which were fully enclosed with viewing slits in the canopy to allow the driver to see. These last two were generally preferred close to the front line trenches offering some protection for the train crew from snipers (figure 4). The 20 hp. Simplex was completely open with the driver fully exposed. These petrol locomotives generally operated under cover of darkness as their engine exhaust was quite noisy easily attracting unwanted attention (Link 2014, p. 170).

The petrol electric tractor was an innovation that proved to be very versatile when put into operation. Rated at 45 hp, the 4-cylinder engine drove a generator producing 500 volts DC current at 80 amps. The petrol engine and

FIG. 3. WD No.1273 an Alco 2-6-2T with a train of open wagons and a party of Australian Pioneers stands next to a shell crater. Image Queensland Museum.

generator could be disconnected from the electric motors on the axles and the engine unit used to generate electricity to provide lighting or power to operate small mobile workshops. Several of these workshops trains operated on the light railway systems on the Western Front. The 200 petrol electric tractors supplied to the military were built by British Westinghouse Ltd or Dick Kerr Ltd in the UK, and weighed 8 tons. Petrol electric tractors were quite powerful with the ability to pull a load of 60 tons on level track (*The Sydney Stock and Station Journal*, 19 March 1920 p. 12).

Lt Colonel Fewtrell illustrated one of the advantages of the Decauville portable light railway system through the relocation of a heavy Howitzer. The road was almost impassable with horses up to their knees in mud. Fewtrell's troops laid pre-fabricated panels of Decauville track made up with 16 lbs per yard rail during the night. The unit then transported the 8½ ton field piece up to its required position much to the amazement of the opposing German troops when daylight came next day (*The Sydney Stock and Station Journal*, 19 March 1920 p. 12).

The Australians found the light railway system invaluable for transport where the very soft ground prevented the use of other mechanical transport. During the Somme winter, the Anzac light railway was carrying about 1000 tons per day over its 25 miles of track (*The Sydney Stock and Station Journal*, 19 March 1920 p. 12).

LETTERS HOME – S H HANCOX

Samuel Herbert Hancox was an engineer with Queensland Railways being the officer-in-charge of the electric powerhouse at Ipswich Railway Workshops. He joined the 4th Australian Divisional Engineers with the rank of Captain. Before leaving for France in February 1916 he was promoted to the rank of acting major. Upon arrival in France, Major Hancox was temporarily detailed for duty with the 1st Anzac Light Railway Company. In this position he was responsible for the construction and operation of a 60 cm gauge light railway network. When the countryside began thawing out after the big freeze of winter in 1916–17 it turned to mud. Hancox had supervised construction of some of the lines while the countryside was still frozen including laying track across frozen shell holes as the light railway had to be laid as expeditiously as possible. There was a problem in locating ballast material suitable for stabilising the track with ice being the main track support. The shell craters could be as much as 10 to 12 feet deep. During the thaw these had to be filled, no easy task when they were full of ice and water. Sometimes the light railway track had to be deviated around the crater. The 1917 spring thaw brought many problems including the necessity to transport many tons of ammunition, but still the Anzac Light Railway Company managed to cope (*The Brisbane Courier,* 5 June 1917, p. 4).

It was a matter of necessity reported Hancox that the light railway units learnt to scrounge whatever materials they could. Rail that had been blown up and twisted out of shape, bent and broken was recovered and straightened. Rail that had been used to stabilise trench systems was also recovered for use in the light railway track. Sleepers were a major problem. The few trees that were still standing on the battlefield were so full of shrapnel from the almost constant shelling that they could not be successfully split or sawn. Timber was obtained for sleepers wherever it could be found. Ballast for the track was to be had by using bricks and chalk broken up from bombed buildings. This was very slow work, with constant pressure to quickly lay the railway track to get it operational. The Australians even scrounged extra locomotives wherever they could be found, including those in need of repair that had been abandoned. Major Hancox was particularly proud of his unit's skill in establishing a blacksmith's shop in an old farm building. They set up a forge and a lathe and by salvaging brass shell cases they could cast new bearings while scrap iron could be forged and machined to manufacture parts to repair old tractor locomotives to get them operational. To further support their blacksmith shop they scrounged local villages for scrap and tools that might assist in their endeavours. The blacksmith was even capable of making new springs for locomotives, having managed to locate a supply of whale oil to enable the proper tempering of the springs during the forging process (*The Brisbane Courier* 5 June 1917 p. 4).

Major Hancox assembled a team of former railway employees offering the skills he needed. Track fettlers, locomotive crews and traffic staff were all drawn from local battalions. Shortages of material for track laying was a problem with some rail having to be laid without fishplates while there was a constant need for dog spikes which also were in very short supply.

The efforts of Major Hancox and his unit surprised staff on the front far exceeding expectations. German shelling was a constant danger. The Anzacs treated their light railway with great respect and were able to establish and maintain a reliable transportation system. The British Military Headquarters were made aware of the achievements of the A. L. R. (Anzac Light Railways) and were suitably impressed although some wags said the initials actually stood for 'Always Leaving the Rails' (*The Brisbane Courier*, 5 June 1917, p. 4).

Hancox and the light railway company that he had gathered together were skilled in their railway construction and operational duties due to their railway experiences before the war. Subsequently, the unit was used to train three other units operating light railway systems nearby. These included one

railway construction battalion from England and two from Canada. Pioneer battalions were also attached to these units.

Although shocked at what was expected of him, Hancox had proven highly successful since first being involved in light railway construction during the Battle of the Somme in July 1916. Wet weather had arrived on 1 August with railway construction carried on in conditions described as being 'like soup'. They had four miles of 60 cm gauge light railway operational within a week, carrying ammunition and other supplies. Hancox was disappointed with this effort thinking they should have achieved more, but not so the military commanders at General Headquarters who were more than satisfied. He was sent for by the corps commander who personally thanked him for his efforts in proving the viability of light railways for transport of men and supplies to the front line (*The Brisbane Courier,* 23 November 1917, p. 8).

The supply trains operated mainly under cover of darkness. The Germans would shell the areas where the light railway was operating to such an extent that repair gangs had to accompany the supply trains to help keep the system operational. The Simplex tractors used in these forward areas could derail or fall into shell holes while travelling at night. To avoid the delays caused by derailments the ALR took to pushing an empty wagon in front of the petrol tractor so that it would derail or fall into the shell holes rather than the locomotive. It was far easier to recover a relatively light wagon than a 40 hp Simplex weighing 6 tons (figure 4). The men showed their determination and skills in ensuring their supply train got through to where they were needed. On one night a truck loaded with artillery shells was derailed by enemy shelling. This vehicle was unloaded and re-railed before being reloaded with its heavy and dangerous cargo. This occurred not once, but

FIG. 4. Simplex 40 hp Protected tractor WD 2232 with a recovery train ready to retrieve a 20 hp petrol Simplex tractor which has been derailed into a shell crater. Image Queensland Museum.

twice. Each time the men got to work, repaired the line and reloaded the ammunition before setting off again, not letting anything to deter them from their duty. The Germans would frequently send over gas shells at night requiring the men to wear gas masks almost constantly. The light railway men were exposed in these forward areas, working out in the open with no protection, from gas attacks, snipers or shelling from enemy positions (*The Brisbane Courier*, 23 November 1917, p. 8).

Hancox in a letter to his mother at Coorparoo in Brisbane said 'The gas shells Fritz sends over are very nasty. I have not had nearly as many casualties as the other systems have had; but it is the hardest part of the business, sending men out into places where they are so much exposed. They work out in the open, of course and are a good distance usually from the front line, but are exposed to shelling and have no protection, and it is always a great temptation to tell them to go back.' (*The Brisbane Courier*, 23 November 1917, p. 8).

The now Director General of Transportation, Sir Eric Geddes, was so impressed with the construction and operation of the Anzac Light Railways that many of its concepts were incorporated into the systems adopted across the British Front. Geddes instigated a Directorate of Light Railways to bring all the light railway systems under a single controlling entity.

During the winter of 1916–17, the main system operating was that of the Anzac Light Railways. Mileages were significantly extended with over 800 miles in operation by November 1917 (*The Sydney Stock and Station Journal*, 1920).

ADVANCES IN 1918

The Germans made significant advances during their March 1918 offensives capturing many miles of light railway track, locomotives and rolling stock. But this proved to be their final effort and as they were pushed back in the following months the military campaign finally became more fluid and mobile as had been anticipated back in 1914.

As the British army units pressed forward during the summer and autumn months of 1918, some attempt was made to keep the light railway systems operational using captured German light railways and building new extensions to keep up with the advances of the front lines. Despite these efforts, however, the light railways were soon being left behind. The engineers instead concentrated on extending the standard gauge lines (Farebrother & Farebrother 2015, p. 70–86).

The Armistice was finally declared and the guns fell silent at 11:00 am on the 11 November 1918. The Great War was over.

DISPOSAL OF LIGHT RAILWAY EQUIPMENT

There were many miles of light railway track, both British and German, available following the Armistice. Some systems were dismantled almost immediately and along with locomotives and rolling stock, were sent for disposal as scrap or for sale and reuse. The French expressed an interest in retaining many miles of the 60 cm gauge in northern France. Altogether the French advised in December 1918 that they were interested in purchasing some 3000 miles of 60 cm gauge light railway. Some of these systems proved useful in the rebuilding of the war ravaged villages, towns and country side operating well into 1919. Other remaining 60 cm light railways proved useful for agricultural crops, with several being used to service sugar beet factories. The British established a Liquidation Commission in May 1919 to oversee the disposal of huge quantities of surplus military equipment including the light railway systems and their rolling stock. The French had a similar disposals organisation to work with the British. Besides the purchase of much of the track that was already laid the French Government also negotiated to purchase rolling stock stored at Beaurainville where a central workshops for the military light railways had been located (Farebrother & Farebrother 2015, p. 138–141).

AN AUSTRALIAN STORY

A total of fifteen of the War Department Hunslet 4-6-0T locomotives were purchased from disposals in the United Kingdom for use in the sugar industry in Queensland. Thirteen of these had served on the Western Front in France, while a further two had never left England as by the time they had been built the war was just about over and they were not required in France. Surplus equipment was placed in the British War Department's store at Purfleet before disposal.

Following overhauls and a slight adjustment to alter their track gauge from 60 cm (1 foot 11 5/8 inches) to 61 cm (2 feet) at the Hunslet Engine Company's factory in Leeds, these former War Department locomotives were despatched to new owners in Queensland. Twelve were purchased by sugar mill companies to be used on their 2 foot gauge cane tramway systems while a further three were purchased by Queensland Railways for their 2 feet gauge Innisfail Tramway system. A new Hunslet 4-6-0T built to the War Department design was manufactured in Leeds in 1925 for use at Kalamia Mill, Ayr in Queensland.

Despite their greater numbers, the Baldwin 4-6-0T locomotives used by the British military were not as popular with Australian buyers with only three coming to Queensland – also for use in the sugar industry. Two went to Marian Mill, Mackay and one to Racecourse Mill also at Mackay. The two at Marian Mill were subsequently scrapped but the Racecourse Mill locomotive, much altered, survives as an amusement ride at Dreamworld, Coomera on Queensland's Gold Coast.

Most of the War Department Hunslet locomotives were scrapped prior to 1960, having been displaced by diesel locomotives, leaving five survivors.

One of the survivors was Builder's Number 1239 of 1916 having been given the War Department running number of 327. It had been sent to France during

FIG. 5. North Eton mill No.4 ex WD Hunslet 4-6-0T 327 shunts the mill yard in 1963. Image C S Small.

November 1916, the last Hunslet to leave England that year with the next not being despatched until February 1917. No.1239 saw service on the light railways of the Western Front before being returned to England following the cessation of hostilities. The locomotive was overhauled by the Hunslet Engine Company in 1919 and sent to the War Department's stores at Purfleet. It was purchased by the Queensland Government's Agent General on behalf of the Queensland Bureau of Central Sugar Mills, for North Eton Central Mill, at Mackay, in June 1920 (figure 5).

This Hunslet was given the number 4 at North Eton being used to haul sugar cane to the mill for crushing until replaced by diesel locomotives in 1964. No.4 was placed on open-air display in Langford Park at Eton township (figure 6).

Whilst in Langford Park, after years of exposure to the elements No.4 had deteriorated significantly. The North Eton mill closed in 1988 following the amalgamation of the Mackay District sugar mills under the combined ownership of the Mackay Sugar Co-operative Association Ltd. The Co-operative, recognising the historical significance of the locomotive, removed No.4 from Langford Park in 1999 and placed it under cover in the old sugar shed at the North Eton mill site for storage and to prevent further deterioration.

No.4 Hunslet 4-6-0T was donated to Queensland Museum in 2005 by the Mackay Sugar Co-operative Association Ltd and transferred to storage at The Workshops Rail Museum, North Ipswich in that year. The locomotive was assessed by Museum staff and a proposal formulated to restore it to its original First World War condition. Parts added and any alterations that had occurred during its service at North Eton mill were to be removed. Research by Museum staff, with the assistance of the Australian War Memorial in Canberra and the present day owners of intellectual property of the Hunslet Engine Company, enabled parts required to be fabricated for fitting to the

FIG. 6. North Eton mill No.4 preserved in Langford Park, Eton – 1981. Image D J Mewes.

locomotive. Copies of original Hunslet drawings were also obtained to assist the project. Parts added to the locomotive during its sugar industry service were removed but were retained and placed in suitable storage as they are part of its history.

Subsequently, No.1239 entered Queensland Rail's Heritage Railway Workshops adjacent to The Workshops Rail Museum in 2013 where Queensland Rail staff and Queensland Rail Heritage Volunteers began conservation and restoration work on the locomotive under the guidance and supervision of staff from The Workshops Rail Museum (figure 7).

There are many rail related museums around the world, but only two major Museums in Australia, the Australian War Memorial, Canberra, A.C.T. and The Workshops Rail Museum, Ipswich, Qld, have available a First World War WD Hunslet 4-6-0T locomotive honouring the contribution of the 60 cm gauge light railways used on the Western Front in France during the First World War.

FIG. 7a and 7b. North Eton mill No.4 undergoing restoration work inside the Queensland Rail Heritage Workshops – 2016. Image 7a courtesy D J Mewes, Image 7b Queensland Museum.

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