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Australian Army General Service Wagon Mark X: researching the historical context of a generic artefact

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Many military artefacts are considered 'generic artefacts', the last remaining examples of standardised equipment produced en masse and used in their hundreds and thousands. It is rare to be able to attach a user's name to a rifle, pick or tent. These items are interpreted as part of the background to a bigger picture of a battle or campaign. When Queensland Museum acquired a horse-drawn General Service wagon in 2013 it was to fill a niche within the Museum's vehicle collection, adding an example of military applications to the multitude of roles performed by horses which are already represented in the collection held at the Museum's Cobb+Co campus. The wagon was a generic representation. It is not known where this particular wagon was used in the First World War, much less who used it. The General Service wagon did not appear initially to be a promising place to start research on the early years of the Australian Army, or the 'Homefront' coachbuilding industry. Yet the simple question of why a wagon of English rather than local manufacture found its way into the Australian Army produced surprising insights. The story unfolded of a country ill prepared to send an army to a war overseas, and slow to comprehend the magnitude of that war. The investigation also revealed something of Australia's role as part of the British Empire in the early years of the twentieth century.

❑ Wagon, Army General Service wagon, coachbuilding, First World War, German wagon

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A military wagon to highlight the role of horses in warfare until the middle of the twentieth century had been on Queensland Museum's list of desired vehicles for a long time (figure 1). The Museum successfully acquired a horse-drawn General Service Mark X military wagon at an auction in Muswellbrook New South Wales in 2013. The General Service wagon's previous owner Mr Ray Gordon had purchased it at Singleton Army base in an auction of military surplus materials in 1947. Mr Gordon used the wagon with two Clydesdale horses, on the family farm near Muswellbrook. The wagon had little provenance pertaining to its military use besides the manufacturer's nameplate. Cursory research indicated that 'Mark X' pattern wagon was of the standard design for 'British' military wagons from prior to the First World War (Parry 1979, p. 44).

FILLING IN THE GAPS IN THE WAGON AND ITS STORY

On arrival at the Museum's Toowoomba campus, Cobb+Co, in 2013 the General Service (GS) wagon condition reflected its age and prior use. It had several holes in its body timbers due to dry rot. The surround timber was brittle and breaking away. The decision was made to infill the missing sections of the boards with matching timber, which in turn would consolidate the surrounding original material. This presented the opportunity to take timber samples, which proved to be western red cedar (*Thuja plicata*) for the body boards, and American white oak (*Quercus alba*) used for the rave rails (tie down rails). The presence of timbers native to North America was a surprise for Museum staff. It was assumed that a wagon used by the Australian Army would have been made locally using Australian timber. This country had a long-established coachbuilding industry by the time of the First World War. It was estimated that there was 8 000 workers employed in the industry across Australia (*The Register Adelaide*, 15 April 1909, p 6) and the use of local hardwoods for wheels and framing, and softwoods such as hoop pine for bodies was the norm.

Another unexpected discovery was that the wagon was entirely built in the one establishment. The coach and wagon building industry at the time often relied on the assembly of ready-made components from specialist suppliers. It was commonplace in Australia for the one vehicle to have Rigby springs and axles from England, hickory wheels and seat from the United States, and a silky oak body made in Australia. This is not the case with the GS wagon. Virtually all

FIG. 1. Queensland Museum's General Service Mark X wagon in the Horse in War exhibition, Cobb + Co Campus, 2015.

steel components in the body and undercarriage, and the brackets under the seat are stamped 'Metro'. This says something of the scope and versatility of the builder, that no other component suppliers were used at a time when outsourcing and subcontracting were the norm in much of the coachbuilding industry. Indeed, having the dies and machinery such as drop hammers to stamp the builder's name on all steel components made this an unusual wagon builder.

Further clues suggested that this wagon was not built by a conventional horse-drawn carriage builder from the early twentieth century. When Andrew MacDonald and Ray Montey from Cobb+Co's Workshop attempted to dismantle the body of the GS wagon to remove the rotten boards, they encountered an unexpected difficulty. Many of the timber components were riveted together rather than screwed in the 'normal' manner. To disassemble the box under the seat the rivets had to be ground off. Once the new in-fill timbers were in place, new rivets were installed. This was not a difficult practice using a gas forge or oxy-acetylene to heat the rivets, and a pneumatic hammer to pein the ends over, but this gave rise to the question of whether these techniques were appropriate for the era. The riveted construction and the use of acetylene gas equipment are not generally associated with the 'horse' era, and not found on any of Cobb+Co Museum's other carriages, carts and wagons.

The military wheels also differed greatly from those normally used on civilian wagons in the era. These wheels have metal flanged hubs rather than 'traditional' wooden hubs morticed to house the spokes. The box insert in the wheels of the GS wagon are made of phosphor-bronze instead of cast iron boxes which are used in wooden hub wheels. Cobb+Co's workshop staff had intended use the GS wagon to teach wheelwrighting skills to volunteers from the *Soldier On* organisation, who were assisting in the preservation project. It soon became apparent that the assembly of military wheels required many skills, but not those common to traditional wheelwrighting. As a result the volunteering military personnel assisted with many tasks in the preservation process and learned some basic blacksmithing, but not wheelwrighting.

The swingle bars which connected the harnessed horses to the GS wagon are also unlike other horse drawn vehicles in the Museum. Whereas most wagon swingle bars were made of hardwood timber with blacksmith-fashioned hooks on either end, the swingle bars on the GS wagon were made from press-folded plate steel over pine. These production techniques are more associated with engineering and metal fabrication than with coachbuilding.

The evidence was mounting that the wagon's builder was neither Australian, nor a carriage builder in the sense usually implied when referring to horse-drawn vehicles. On-line research revealed 'Metro' to be the Metropolitan Carriage Wagon and Finance Company of Birmingham, England (Grace's Guide Limited 2018). The carriages and wagons built in the Metropolitan works were railway wagons and carriages, which along with locomotives were exported all over the world (Garret & Wade-Matthews 2001, p. 137, 214, 238). In summary, Cobb+Co Museum's Australian military wagon was manufactured in a large British railway workshop.

The wagon is so unlike any other in the museum, staff were led to suggest that perhaps Australian coachbuilders were incapable of producing such a military wagon when the General Service Mark X wagon was built in 1916.

DEVELOPMENT OF THE BRITISH GENERAL SERVICE WAGON MARK X

The General Service Mark X wagons were designed by the British Army's Woolwich Arsenal in 1905 to be both light and durable under adverse battlefield conditions. To achieve this, engineering construction techniques were incorporated which were modern for the time (Parry 1979). Experience in the harsh, dry conditions in South Africa during the Boer War convinced the British Military of the need for light robust wagons.

Parry suggests later designs drew upon elements of the Mark VII wagon of 1888. This wagon was much lighter than previous British military wagons, with a pole rather than shafts for attaching the horse team.

The 1905 pattern wagon was to be even lighter and stronger. The folded metal and pine swingle bars at two kilograms weigh three kilograms less than hardwood wagon swingle bars in the Museum. When a four horse team was harnessed with a spreader bar the weight saving would be around 17 kilograms. The body of the wagon also displays design elements which provide savings in weight. The metal plates reinforcing the box under the seat reduce the framing timbers needed. So too does the use of wooden standards (posts) to support the sides of the body, rather than a ribbed frame or steel buttress brackets. 'Tongue and groove' timber boards bond together without needing a frame to screw into. The absence of a frame may also explain the use of rivets rather than screws to secure rave rail brackets on the sides of the wagon. Without a hardwood frame wood screws would not have enough timber to 'bite' into, particularly since the side timbers are a softwood. Rivets as an alternative would not give way under tension when ropes securing a load or a tarpaulin were pulled tight on the rave rail brackets. Countersunk bolts with nuts would be as strong as rivets but rivets, for military purposes of durability, have the advantage of never coming loose.

Another feature of the General Service wagons was the use of metal flanged wheels. This type of wheel had already been in use for gun carriages and limbers since the mid-1880s. The British attribute the design of this style of wheel to Walter Hancock who built and operated steam powered omnibuses in the 1830s (Bird 1969, p. 80). Hancock found wooden hub wheels broke off at the spoke tenon due to the greater torque on the driving wheels on his steam driven vehicles. He needed something stronger. The twelve spokes on Hancock's wheel tapered to wedges of 30 degrees near the hub. Each spoke butted up against the next. The spokes were held in place at the hub by metal flanges. The large surface area between adjoining spokes transferred the turning force more evenly throughout the wheel. Hancock's wheels also proved more resilient to lateral thrusts than conventional wooden hub wheels, experienced when turning sharply. The technology was forgotten for several decades, but in the 1880s metal flanged wheels were fitted to artillery carriages and limbers which were required to travel cross country at galloping pace, turning often to avoid obstacles. Hence the British referred to the design as 'artillery' wheels. The military wheels also had phosphor bronze boxes rather than cast iron. Phosphor bronze has the advantages of a low coefficient of friction and corrosion resistance while maintaining a high tensile strength (Bhandari 2010, p. 43).

A similar type of wheel had been in use in the United States on their military escort wagons since 1882. The Americans referred to the design as 'Archibald' wheels, after Edward A. Archibald who patented elements of the hub design in 1871 and 1872 (Berkebile 1978, p. 310). British artillery wheels bear a striking resemblance to the American Archibald wheels. Indeed there are great many similarities between the American and British military wagons, including the design of the undercarriage, the wheel diameters and the 1.5 tonne carrying capacity (Berkebile 1969, p. 24). The British commander in the Boer War, Field Marshal Lord Roberts, actually preferred the 300 American wagons purchased from the Studebaker Company in December 1899 to the British military's Mark VIII General Service wagon which was the recommended British military vehicle.

Lord Roberts addressed the British Parliament;

> Waggons were imported from the United States and they proved to be superior to any other make, either of Cape or English manufacture... It may be added that they cost considerably less than Bristol pattern wagons. (Bonsall 2000, p. 37)

The preference was clearly for the cost, lightness and durability of the American escort wagon as produced by Studebaker over those built by Britain's largest wagon builder in Bristol (Bristol Wagon and Carriage Co, 1900). Studebaker's ability to produce the wagons quickly and in large numbers also impressed the British War Office. In

1898 Studebakers made 500 military wagons for the American Army in 36 hours, to be used in the Spanish-American War (Bonsall 2000). Studebakers at this time produced over 100 000 vehicles per year and had 2500 employees in their Indiana factory (Kinney 2004, p. 221).

Suffice to say, when the British military authorities at Woolwich Arsenal designed their military wagons, and particularly the Mark X, they had a well-developed set of criteria to be met and reasons for arriving at that list of criteria.

AUSTRALIAN COACHBUILDERS' RESISTANCE TO BRITISH MILITARY WAGON DESIGN

Australian coachbuilders had an opportunity to supply Lord Roberts' army in South Africa but failed to take advantage of the opportunity. The Imperial War Office in 1900 was searching throughout the Empire for suppliers of the then current Mark VIII General Service wagons for the war in South Africa. The New South Wales Government had assured the British that local coachbuilders could produce 50 wagons a week. An order for 100 was received from the Imperial War Office (*Daily Telegraph* [Launceston], 7 February 1990, p. 5). The local industry quickly informed the New South Wales Government they were mistaken. The trade journal, *The Australasian Coachbuilder and Saddler* commented,

> If good serviceable vehicles such as the German waggon or the American buckboard are sufficient, they could be built by the hundreds weekly, where cumbersome wagons with finical fittings, such as the regulation wagon "mark 8" could not be made in tens… (*The Australasian Coachbuilder and Saddler*, January 1900, p. 181)

The magazine went on to say that the military wagons could not be readily produced with the labour and the machinery in Australia at the time, but required the 'services of trained men'. The coachbuilders quickly decided they could not build the military pattern wagons to the specifications laid down by the War Office. The machinery for large scale production in use in the United States was in short supply in Australia. The Australian market was not large enough for mass production techniques resulting from economies of scale. Components which could be produced in large numbers America with drop forges and copy lathes had to be made by hand in many cases.

Eventually West's Cold Tyre Setter Company of Sydney made just ten German style wagons which were sent to London. It is interesting to note that West's were not actually coachbuilders but rather specialist wheel builders with heavy pneumatic machinery for fitting iron tyres. Even they admitted to not being coachbuilders, but wanted to show the British that Australians could build wagons. The Coachbuilder magazine reiterated that in regard to military pattern wagons, 'waggons of that type could not be produced here in sufficient quantities within the time available, and also that it was not the best type of wagon for the work to be done in South Africa.' (*The Australasian Coachbuilder and Saddler*, November 1900, p. 159). The local industry thought they knew better than the customer, the British military authorities in Woolwich England. The Coachbuilder magazine did not say what the British thought of the ten unsolicited wagons sent from Australia.

Following Lord Roberts endorsement of American wagons in South Africa, there were local attempts to match them. The *Australasian Coachbuilder and Wheelwright* reported in 1903 (July 1903, p. 75) that coachbuilder Richard Spencer Carriage and Waggon Manufacturing Co of Adelaide built two transport and two ambulance wagons for the Australian Army. 'The transport wagons were built on the lines closely approximating the Studebaker wagons used in the South Africa, which earned the favourable criticism of Field Marshall Lord Roberts…' The wagons used sarven wheels which resemble artillery wheels but had wooden hubs covered by metal flanges. Australian coachbuilders could not manufacture

true artillery wheels with phosphor bronze boxes so it seems they may have tried to use an alternative that looked the same.

The design elements – for lightness and durability being incorporated into new General Service wagons by the British – filtered through to Australia even before the Mark X 1905 pattern was formally approved. Sydney coachbuilder G.H. Olding, in a paper for the Australian trade journal, summed up the feelings of the local industry to the proposed new military wagon design. He questioned whether the reputation of Woolwich Arsenal for producing artillery pieces extended to expertise in wheel and wagon design. 'It would not be possible to manufacture wheels of the ordinary military pattern in more than one or two cities in the Commonwealth. It would require… either special plant to make the hubs in each city, or a large stock of hubs being kept…' (*The Australasian Coachbuilder and Wheelwright*, September 1904, p. 101). Olding added that 'the wheels would have to be repaired by workmen unfamiliar with them.' He advocated using wooden hubs familiar to wheelwrights. A 1907 Defence Department specification list for armoured ammunition limbered wagons with machined axles and bored phosphor bronze wheel hubs, all of specified metals and to predetermined tolerances, was only to be read by coachbuilders for 'instruction or amusement' according to the Coachbuilder magazine. Australian coachbuilders could not build these sorts of vehicles (*The Australasian Coachbuilder and Wheelwright*, February 1907, p. 240). Some machinery such as copy lathes for making wooden hubs and spokes, and hydraulic rams for the cold application of steel tyres, had been introduced since the 1890s; many Australian coachbuilders were slow to adopt new technology. There was still debate in in the Coachbuilder magazine in 1907 (March 1907, p. 269) about the virtues of a piece of machinery as basic as a bandsaw.

The *Australian Coachbuilder and Wheelwright* was still expressing that opinion in 1912 that '…military vehicles appear to be designed by men who are engineers first and coachbuilders only incidentally if at all…' (*Australian Coachbuilder and Wheelwright*, November 1912, p. 210) The magazine conceded that, in the event of war, Australian equipment would need to be compatible and interchangeable with that used by the British Army. Finally a few coachbuilding companies such as G.H. Oldings began building articulated limber wagons to British military specifications for the Defence Department from 1912. Articulated ammunition wagons used by artillery regiments in the field definitely benefitted from the metal artillery hubs as they were required to be very manoeuvrable and go 'cross country'. It was no mean feat to comply with the exacting Government standards. T.J. Richards of Adelaide withdrew from the tendering process, and Bloomers Foundry of Beenleigh in Queensland had their contract reduced in 1914 because some vehicles did not pass inspection. Oldings' were required to finish most of the 600 artillery ammunition limbers (*Australian Coachbuilder and Wheelwright*, December 1912, p. 248; November 1914, p. 209; *Brisbane Courier* January 1915, p. 13). The metal hub military wheels were imported from Britain. There was still no local capacity to make the steel plated phosphor bronze hubs. The manufacture of military wagons was at the limit, or perhaps even beyond the limit, of the Australian coachbuilding industry's level of technology. And although the Australian Army now had some articulated artillery wagons on order there were still no plan to build a standard 'general service', rigid body wagon.

BYO WAGONS AND HORSES

Australia was concerned enough about its defence to introduce compulsory peacetime military training of 16 days annually for males between the ages of 18 and 20, and registration with the military for males up to 26 years of age in the *Defence Act* 1909. This was believed to be the first legislation of its kind in the English-speaking world (Australian Bureau of Statistics 1971). Field Marshall Lord Kitchener was invited to Australia by Prime Minister Alfred Deakin in the same year to gauge

Australia's preparedness to defend its shores. Kitchener attended manoeuvres and inspected facilities and equipment in several states, and produced a report. He expressed concern about a number of issues including Australia's variety of railway gauges and the inefficiencies in moving troops and equipment. He advocated an army including full-time and reserve forces of 80 000 (*Sunday Times* [Sydney], 20 February 1910, p. 12). It is surprising therefore that no mention was made of the fact the Australian Army did not even have a standard design for 'general purpose' wagons, let alone any actual wagons.

The Federal Government from 1911 established an armoury to produce small arms and ammunition at Lithgow New South Wales, a saddle and harness factory at Clifton Hill in Melbourne, and a clothing factory for uniforms also in Melbourne (*Express & Telegraph* Adelaide, 24 July 1911, p. 4). Little was done to provide transport for the Army's supplies. Indeed, prior to 1914 the Army had very few horses even to pull the guns and ammunition limbers of the Artillery Corps. It had been the practice for 'Saturday afternoon training' to hire cart horses which during the week were used by carrying companies. The Army's first 2 300 horses were purchased early in 1914 for the artillery, ambulance and service wagons (*Great Southern Herald* Katanning WA, 1 April 1914, p. 4). This late date for the acquisition of horses may have been due to the decentralised nature of the militia army. When reporting for training in regional areas troops often brought their own horses to ride, and even horses and wagons for transportation of the unit's equipment to camp sites. Lord Kitchener had supported the defence structure of 215 military districts across the country (*Sunday Times* [Sydney], 20 Feb 1910, p. 12). General Sir Ian Hamilton in a follow up report in early 1914 urged even further decentralisation of the military to regional units and rifle clubs to make any invasion of Australia more difficult. As late as May 1914 there was no consideration of a standing army available for overseas deployment; 'Unlike a regular army, the Australian militia had no overseas duties or police functions to perform in peace…' (*Telegraph Brisbane*, 21 May 1914, p. 2). The militia army was only geared to defending Australia, and there were plenty of farm and delivery wagons in civilian use spread across the country if the Army needed them.

In 1911 the Army did at least select a preferred style of wagon for its use. The Australasian Coachbuilder and Wheelwright noted in 1911 that the Army was testing various styles of wagons at West Maitland (April 1911, p. 4). They ultimately recommended the German style wagons which had been proposed to the New South Wales Government back in January 1900 by the West's Cold Tyre Setter Co. (*The Australasian Coachbuilder and Saddler*, February 15 1900, p. 204). The design of most interest was again described by the magazine as a 'German farm waggon', and added that this was a style found in Queensland and South Australia but not common in New South Wales, leaving the industry in that state somewhat on the outer. However the trade journal and newspapers made no mention of the Army actually buying any of this type of (rigid body) wagon over the next three years, although contracts were granted for the articulated limbered artillery wagons mentioned above. Requests were made to farmers to provide the necessary rigid wagons through the press, and presumably through local army units. There was a suggestion that patriotic farmers in New South Wales might also adopt the German farm wagon, just in case the Army needed them (figures 2a and 2b).

A little over 12 months later a Major Lee was inviting people with German wagons in the Maryborough region (QLD) to register their wagons for service in times of war. 'The number of wagons required is twelve and loads will not exceed 30cwt.' (*Maryborough Chronicle,* 18 Nov 1912, p. 4). These wagons would only be of use in the event of a conflict on Australian soil. With the First World War just around the corner Australia had very few wagons it could send with an expeditionary force.

The German Waggon

APPROVED FOR ARMY TRANSPORT.

The report of the Inspector General of the Commonwealth military forces, recently issued, lays special stress once more upon the importance, from the defence standpoint, of the farmers regularly using a style of waggon adapted for the requirements of army transport. The Inspector General specially commends the two-horse waggon used by the German settlers all over Australia, but not very generally adopted in districts where there is no German population. The waggon, as illustrated herewith, is a strong, springless vehicle, the sides and back canting outward to hold a lot.

Whilst it would be asking rather too much of farmers to deliberately set themselves to use an unsuitable meant of transport on their farms, simply to please the military authorities, it may easily be that this German waggon is the best vehicle for general farm use; and if the farmer can provide the best waggon for his own requirements and at the same time do something towards ensuring effective transport for the army in time of war, we take it that every man on the land will do so. Patriotic men on the land should take the first opportunity of inspecting the German waggon.

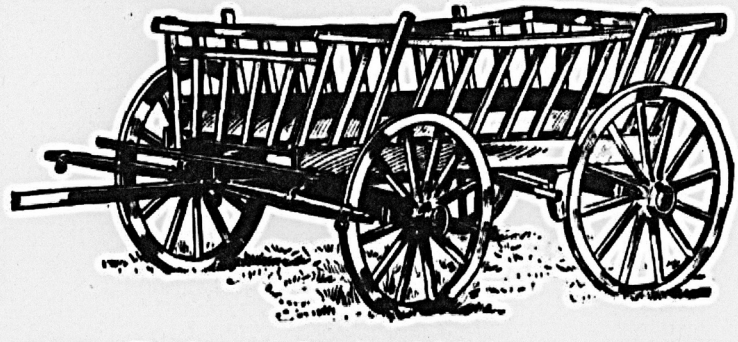

FIG. 2a. *Farmer and Settler* Sydney, 29 August 1911, p. 2.

The German Type of Waggon, which Major-General Kirkpatrick Recommends that Australian Farmers should be Encouraged to Use.

FIG. 2b. 'The German Type of Waggon which Major-General Kirkpatrick Recommends that Australian Farmers should be Encouraged to Use.' (*Sydney Mail*, 6 November 1912, p. 14). Major-General Kirkpatrick was Inspector-General of Australian Commonwealth Forces 1910-1913. The British officer was appointed by the Fisher Government on the recommendation of Lord Kitchener (*Argus*, 13 November 1913, p. 8).

AUSTRALIA GOES TO WAR WITH THE WRONG WAGON

Australia followed Britain to war in August 1914. The Australian Army urgently needed rigid body general service wagons although it had limbered wagons on order, primarily for the Artillery Corps. The Australian Defence Department pushed ahead with orders for its approved German style general service wagon to be manufactured locally. A sprung seat and footboard were added to the basic farm wagon design to accommodate a driver, although it was also common practice to drive military vehicles postilion (ie. sitting on 'near' or left side horse). T*he Australasian Coachbuilder & Wheelwright* (August 1914, p. 118) pointed out to those embarrassed to use something called a German wagon in a war with Germany, 'This is the most ancient type of vehicle that survives. It did not originate with the Germans, although it was introduced to Australia by them.'

Contracts to supply a range of horse-drawn vehicles such wagons, ambulances and water carts went to companies which could fill a large order in a short space of time. The biggest contract by far went H.V. McKay's Sunshine Harvester Company (figure 3) in Melbourne, which had 2600 staff (*The Chronicle* [Adelaide], 29 May 1926, p. 20). Like West's Cold Tyre Company in 1900, the wagons were to be built by a company which were not actually coach and wagon builders. H.V. McKay was one of the country's largest and best known manufacturing

FIG. 3. German style wagons and water tanks at HV McKay's Sunshine Harvester Works, Melbourne, prior to embarkation for Egypt. Image: Museum Victoria, MM 118394.

enterprises. The company was a specialist farm machinery builder, but mechanised and large enough to fill a big and urgently needed order. The *Australasian Coachbuilder and Wheelwright* listed H.V. McKay's order as 517 wagons (General Service), 213 ambulance wagons, 18 maltese carts, 10 light carts and 91 water carts. The total of 852 vehicles compares with contracts for only 144 carts and wagons which were spread over nine other manufacturers in Melbourne, Sydney, Adelaide and Fremantle. Keep Brothers and Wood of Melbourne, Australia's largest specialist wagon wheel manufacturer received a contract for 1274 wooden wheels, presumably for the vehicles coming from the H.V. McKay factory. The wheels were made in three weeks with staff working around the clock (The *Australasian Coachbuilder and Wheelwright*, Sept 1914, p 161, 196). The wheels and the 517 General Service wagons were all of the Australian Army 'German wagon' design, and did not conform to British Army General Service Wagon Mark X specifications.

Although the Defence Department had awarded contracts to any companies who could fill those large contracts in a few short weeks, the mainstream coachbuilding industry protested. The Master Coach Builders and Wheelwrights Association carried a resolution to the effect that the government should 'in circumstances such as the present, take the trade into its confidence, and allow a committee of reputable coach builders…' to assist with setting prices and 'other details' (*The Age*, 18 September 1914, p. 8). The *Australasian Coachbuilder and Wheelwright* was more forthright. The trade journal derogatively referred to H.V. McKay as 'a firm of implement makers'. In an article titled 'Defective Military Vehicles' they described the whole process to produce vehicles for the Expeditionary Force as flawed, and the vehicles themselves as the 'panic productions' of the war effort. The magazine criticized both the design and the finish of vehicles, and believed the whole project would adversely affect the 'reputation of Australian Coachbuilders' (The *Australasian Coachbuilder and Wheelwright*, September 1914, p. 165).

There are a large number of photographs in collections across Australia of the German style GS wagons in use with the Army in Egypt. The wagons were no doubt used to good effect, but by mid-1915 the Defence Department announced that future contracts would be for 'New pattern transport waggons' to conform with the British General Service Mark X, albeit with some small modifications. It seems unlikely that any German style General Service wagons left Egypt for France, or later into Palestine. The *Australasian Coachbuilder and Wheelwright* reported that the wagons hastily built in 1914 had not performed well in Egypt and were 'all set aside', although photographic evidence suggests the German style GS wagons were extensively used early in the War (July 1915, p. 79, 86). The Government acknowledged that using other than the 'imperial design' was a mistake, although this realisation may have been due more to direction from British military authorities than the protestations of the local coachbuilding industry. Standardisation, particularly of axle lengths, to conform to railway wagon transport and pontoon bridges in war zones was a vital consideration.

Yet the British military authorities did not seem totally averse to buying off-shore, or even to purchasing other designs if they could be supplied urgently and in large numbers. The British Army placed orders for 3 000 wagons with Studebaker in America (Erskine 1918, p. 77), and 2 000 from Bain Wagon Company in Canada in 1914. The wagons were not of the standard Mark X General Service design. Studebakers supplied their 3 000 wagons, along with 20 000 sets of harnesses, in 16 weeks. Bain meanwhile had 600 staff and were producing 90 wagons per day in their factory in Woodstock Ontario. The Australian trade journal marvelled at the Bain Company's machinery which could simultaneously drill 50 screw and bolt holes of varying sizes in the side of a wagon (The *Australasian Coachbuilder and Wheelwright*, December 1914, p 222; February 1915, p. 283). Both companies also produced thousands of military pattern wagons for their own respective armies as well. Britain would accept

thousands of urgently needed wagons from North America. Accommodating Australia's relatively small numbers of non-standard wagons, shipped from the other side of the earth, into a larger British Commonwealth force was not evidently desirable in a military context.

Australia went to the War with the 'wrong wagon', but there had been one major advantage with the German wagon style. These farm wagons could be, and were, built by even the most rustic of rural wheelwright workshops. Now the Defence Department had to award contracts for a style of wagon that coachbuilders did not like, and even the bigger and more mechanised workshops would struggle to build. Attempts to remedy the situation resulted in a redesign of the British Mark X wagon pattern. Contracts for the new 'Commonwealth pattern' General Service wagons were not let until the second half of 1915 (The *Australasian Coachbuilder and Wheelwright*, July 1915, p. 79). GH Oldings in Sydney, Keep Brothers and Wood in Melbourne, JA Lawton and Sons and TJ Richards of Adelaide each produced several hundred Commonwealth General Service Mark X wagons for the Australian Army (figure 4) (The *Australasian Coachbuilder and Wheelwright*, October 1915, p. 153). Photographs of a wagon built by Oldings' coachworks show the rave rails and riveted bracket supports had gone, to be replaced by a flared top board. The tongue and groove sides of the body which were supported by wooden standards were replaced by two side boards secured by four steel buttress brackets. The wire rope to the brakes was replaced by a more elaborate mechanism and handbrake. These changes would have added to the weight of the wagons. These 'small modifications' made to the design to accommodate local builders still incurred the wrath of British Army

THE NEW MARK 10 WAGGON.

The accompanying photograph shows a modification of the Imperial pattern Mark 10 transport waggon, which has been adopted by the Commonwealth Defence Department. Wheels and axles are interchangeable with the original Mark 10, and also with certain other military vehicles. The wheels on the samples are Sarven pattern, but we understand that this wheel has not been definitely decided upon.

FIG. 4. 'Commonwealth' General Service Mark X wagon prototype outside Keep Brothers and Wood, Melbourne. Image *Australasian Coachbuilder and Wheelwright*, October, 1915.

inspectors. Some Australian wagons were condemned in Britain for being three inches too wide.

The wagons referred to are doubtless the Commonwealth Defence Department's modification of the Imperial Mark X, which was made both wider and longer in the body, besides having other departures from the Imperial pattern. Some hundreds of these wagons had been shipped to England (The *Australasian Coachbuilder and Wheelwright*, Nov 1916, p. 171).

The pedantry of British officials should not have surprised Australian coachbuilders or Australian Defence Department staff. Back in 1909 the *Australasian Coachbuilder and Wheelwright* published an article and plans (figure 5) pertaining to the British Mark X wagon which succinctly summed up the design criteria.

> Military requirements demand that the wheels of wagons shall track with those of gun and ammunition carriages, accordingly the axles on this design are shorter and the body narrower than are usual or at all necessary with ordinary farm vehicles. (The *Australasian Coachbuilder and Wheelwright*, July 1909, p. 104)

The British did not want a myriad or different gauge ruts chopping up the already boggy roads on the Western Front. Another drawback of the Australian wagons was they could not be 'broken down' (dismantled) for transport on ships or railways as easily as the British wagons, or even the earlier German style wagons.

In February 1918, a Defence Department report stated that over 1000 general service and limbered

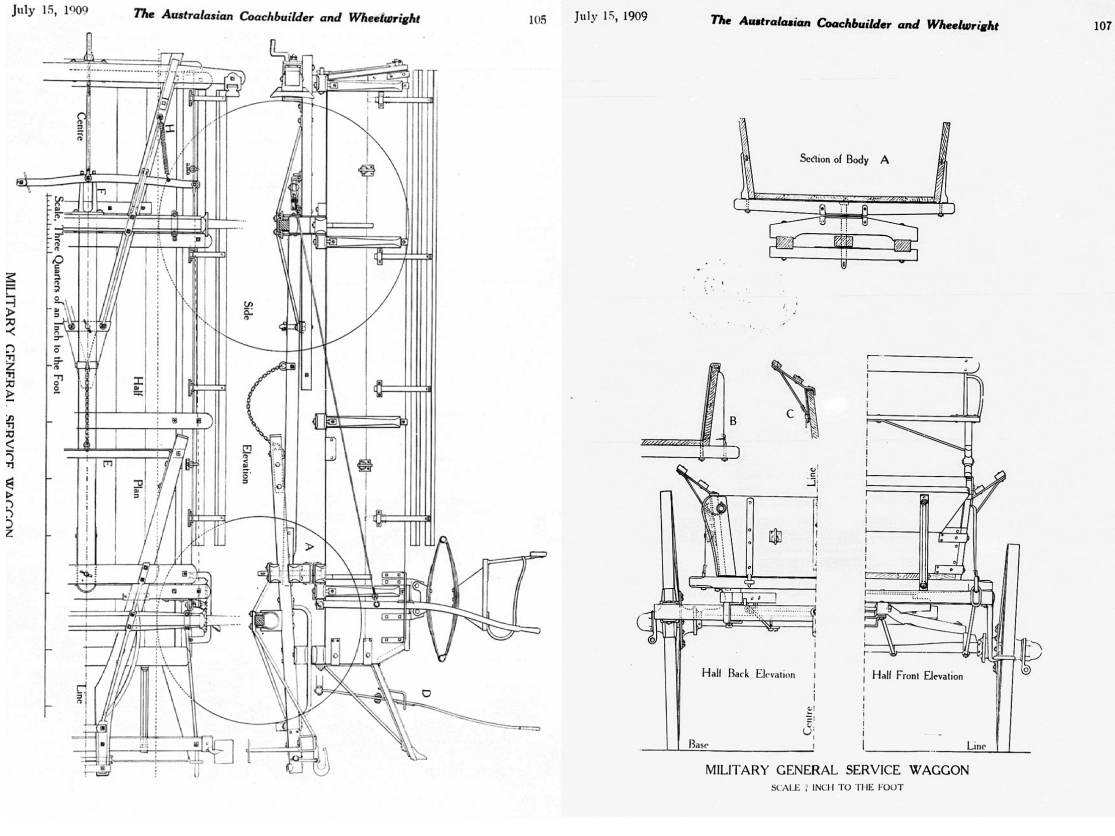

FIG. 5. 'Military General Service Waggon'. The plans show (and the accompanying article stressed) that the British military wagon was narrower than wagons in civilian use. Image *Australasian Coachbuilder and Wheelwright*, 15 July 1909.

wagons in Australia, 'unsuitable for the purpose for which they were designed', were unneeded and taking up storage space, or were sitting in the open. The report, according to the *Coachbuilder* journal, noted that because of 'the nature of their construction' they would be unsuitable for commercial or farm use. The Department was giving consideration to the disposal of the wagons, as not as many as originally intended went overseas. The war, according to the *Coachbuilder*, was moving to greater use of motor vehicles (The *Australasian Coachbuilder and Wheelwright*, February 1918, p. 249).

Some Australian made 'Commonwealth Mark X' wagons did make it to Europe. Australian War Memorial photo EO2924 (figure 6) shows the distinctive curved brake lever and solid sides of an Australian Mark X wagon carrying wounded soldiers at Picardie, near Hamel, on 8 August 1918. Generally where a wagon could positively be identified in Europe it was of the British pattern. Australia shipped horses directly to the Egyptian remount camps, and the Australian 'Commonwealth Mark X' wagons may have also been sent with the horses to be predominantly used in the Middle East (War Office 1922, p. 369).

Larger local coachbuilders such as Keep Brothers and Wood of Melbourne, Oldings in Sydney, and TJ Richards in Adelaide expanded their workforces and brought in heavy equipment such as drop hammers and compressed air rivet hammers, and incorporated machine shops to increase the scale of

FIG. 6. An Australian 'Commonwealth Mark X' wagon near Hamel, France, August 1918. Image: Australian War Memorial, EO 2924.

production (*The Australian Manufacturer*, 22 April 1916, p. 8–12). Yet the need for wagons, military or civilian, was waning and these companies went on to make motor car components. There was no need to build any new military wagons after the First World War. The returning Army brought back hundreds of the British manufactured wagons at war's end, as well as the Australian built variety. The end of the First World War did not completely mark the end of military horse-drawn transport. Both the British and Australian Armies continued to use horse-drawn wagons through to the late 1930s, and in a limited capacity on the homefront in the Second World War.

The Australian War Memorial and the Army Museum at Bandiana each have an Australian built 'Commonwealth Mark X' wagon. These Australia made wagons were sound, even if local industry had some trouble meeting British specifications.

'METRO' AND BIRMINGHAM

While Australian coachbuilders were struggling to build a wagon compatible with British specifications, Britain itself had geared up to manufacture General Service Mark X wagons by the thousands. The Metropolitan Carriage Wagon and Finance Company which made Cobb+Co Museum's GS wagon was a Birmingham conglomerate which included at least five Midlands railway manufacturing companies early in the twentieth century. Frank Dudley Docker, head of 'Metro', also had interests in shipbuilding, paint factories and manufacturing electrical equipment. Metros' factories built most of Britain's tanks and also built aircraft, as well as continuing to build railway rolling stock. The Saltley factory alone covered over 49 acres (*The Times*, 27 August 1915, p. 3). During the First World War, Metropolitan Carriage Wagon and Finance Company grew to a share value of £10 million, an enormous amount of money for the period (*The Times*, 25 May 1918, p. 10). Metro took a controlling interest in British Westinghouse, and amalgamated with Vickers Limited in 1919 to form an even bigger railway manufacturing, engineering, electrical and armaments company (*The Times*, 25 March 1919, p. 22).

Moreover, the Metropolitan Carriage Wagon and Finance Company was the largest company manufacturing railway wagons, but only one of 14 in the trade (*The Times*, 20 Sept 1913, p. 15). These too had advanced engineering capabilities and scale on their side, and all built horse-drawn wagons for the British Army. The Great Western Railway's Swindon works alone produced 1100 wagons (Russell 1995, p. 213). The railway transport companies' workshops employed over 78 000 tradespeople, and this figure does not include the workers in specialist railway rolling stock factories like Metro, the Gloucester Railway Carriage and Wagon Company, or the Bristol Wagon and Carriage Works which was also a noted horse-drawn vehicle builder (Pratt 1921, p. 583). These together constituted a staggering productive capacity with precisely the metal and woodworking machinery to contribute to Britain's war needs, including the manufacture of horse-drawn army wagons.

Britain had been known up until the First World War as 'the workshop of the World', and Birmingham and the surrounding 'Black Country' of the Midlands was the major transport and manufacturing hub of Britain. Birmingham itself was called the 'city of a thousand trades'. General Sir John French summed up the War as a competition of 'Birmingham versus Krupps' (*The Times*, 27 August 1915, p. 3). A list of the Birmingham companies inspected by King George V in just one day in 1915 included Kynocks Limited (explosives), Birmingham Small Arms (weapons and ammunition), Birmingham Metals and Munitions, the Wolseley Motor Company, as well as the Metropolitan Carriage Wagon and Finance Company (*The Times*, 14 July 1915, p. 6). A host of engineering works, foundries, and tool manufacturers were located within ten kilometres of the centre of Birmingham. These included Brades Steel Works (toolmakers), Guest Keen & Nettlefolds (bolts and screws) and

James Booth & Co which produced alloy metals including the phosphor bronze of military wheel hubs (Stephens 1964, p. 140–208). All were large industrial complexes. The leather and saddlery town of Walsall, which manufactured military harness for the thousands of wagons, was just up the road. Every component to build and equip military wagons was to be found in Birmingham. Indeed virtually everything Metro needed to build thousands of wagons, such as drop hammers, copy lathes, pneumatic hammers, and timber milling equipment was in plentiful supply in their own factories. (The number on the maker's plate of Cobb+Co Museum's GS wagon is E115585. The last four digits may represent its number out of the factory).

Britain's Ministry of Munitions, and associated organisations such as the Railway Executive Committee which controlled railway transport and production, could martial this productive capacity to meet the huge demands of the British War Office from 1915 (Pratt 1921, p. 605–606).

WAGONS TO THE FRONT

After the slow start in 1914 when wagons were imported from Canada and the United States, Britain soon was producing the equipment it needed, albeit with some imported raw materials such as the North American timber in Cobb+Co Museum's GS wagon (War Office 1922, p. 530). A total of 45 674 four wheeled wagons were shipped overseas from Britain in the War. This number does not include the thousands of vehicles the Army used at home in Britain. There may have been 50 000 wagons identical to Cobb+Co Museum's General Service wagon Mark X (figure 7). With other limbered wagons, carts and horse-drawn ambulances the number of vehicles shipped across the English Channel was 130 645 (War Office 1922, p. 520). Nor does this amount include the Artillery's guns and carriages, nor the horse-drawn field kitchens and water tanks, telegraph cable wagons and pontoon wagons.

Well over one million horses and mules were used to haul this huge multitude of vehicles (War Office

FIG. 7. Australians with a British-made General Service Mark X wagon near Ypres, Belgium, October 1917. Image: Australian War Memorial, EO 1054.

1922, p. 396). They moved literally millions of tonnes of ammunition, general supplies, and even 6 014 415 tonnes of oats and hay which together made up the largest commodity sent across the Channel during the War (War Office 1922, p. 520). Horses, mules and wagons often operated close to the front, ferrying materials from the railway. There was enormous attrition of horses and mules directly through wounds or 'debilitation', where the horses simply died from work and exposure. Of 869 931 horses present in 1917, the British Forces lost 256 204 in that year alone. It was a war of astronomical figures and industrially supported carnage. British Forces, including Commonwealth troops, suffered over 908 thousand dead and over two million wounded (War Office 1922, p. 237, 397).

DISCUSSION

The acquisition of the General Service wagon by Queensland Museum led to interest in the pivotal role horses played in the First World War. Horses and the troops involved in transport such as the Army Service Corps moved many millions of tonnes of vital supplies. This history is an obvious and important element of the wagon's significance. Yet it was research arising out of work to stabilise the wagon that led in directions not expected when the wagon was acquired in 2013. The wheels with metal hubs, the riveted brackets, and the formed metal corner brackets and swingle bars showed that in spite of appearances this wagon was very different to any coachbuilder produced vehicle in the Museum. Indeed, its construction largely precluded coachbuilder involvement. Its English origins and its design tell their own story. The wagon at once represents the millennia-old part horses played in war, but at the same time was a product of Britain's industrial mobilisation on a previously unmatched scale, to feed a war of incomprehensible magnitude and horror. This British wagon historically links and locates Australia in the 'British Forces' of the First World War.

The wagon's English manufacture highlights how unprepared Australia was for a war overseas in support of Britain. Australia could supply its own rifles and ammunition, uniforms, kit and saddles for a militia geared to home defence, but at the beginning of 1914 it had virtually no supply wagons other than what it could borrow in any local district. Britain too was unprepared for a largescale war with just 25 000 horses compared to the almost one million it would have on hand throughout the War, and had a correspondingly small number of wagons (War Office 1922, p. 396). Yet Britain quickly geared up for production on an enormous scale in its own industrial heartland with the biggest engineering factories available, the railway workshops.

In Australia neither the coachbuilding industry nor the Department of Defence comprehended the demands of an overseas, large scale war. On the one hand the Australian Defence Department issued specifications for vehicles incompatible with the prescribed Woolwich Arsenal pattern wagon, and at the same time Australian coachbuilders showed a continuing habit of questioning the wisdom or necessity to meet the British requirements. When the Australian Defence Department, in desperate need for wagons in 1914, proceeded with the German wagon style from Sunshine Harvester Company, the decision was ridiculed largely because it reflected badly on the Australian coachbuilding industry. The scale, urgency and industrial nature of supplying war materials, and by implication the nature of the war itself, seemed beyond the comprehension of the slighted Australian coachbuilders. This need to be seen to be 'doing our bit', and 'up to the challenge', was perhaps was a metaphor for the home front per se', at least prior to the horrors of the Somme in 1916.

Britain herself had produced tens of thousands of General Service wagons by the time Australian coachbuilders produced an acceptable equivalent wagon. The urgency had passed and many wagons never left Australia. The question remains whether Australia may have been better served if the Defence Department had also contracted larger and more mechanised manufacturers such as Australian

railway workshops, or even H.V. McKay's Sunshine Harvester Company, to build General Service Mark X wagons as per the British design.

Australia was very much still a part of the British Empire, and fought as part of the 'British Forces' with equipment that was compatible with the British war machine. Britain valued and needed our soldiers, and horses, but could produce plenty of wagons herself to go around. We do not know specifically who used Cobb+Co's General Service wagon, or even what it carried. However the General Service wagon Mark X is an important, tangible artefact of the First World War; to the role of horses in the War; and to Australia's part in the War. This Birmingham-built wagon is also a link to the long forgotten saga of Australia going to the First World War in German wagons. The German wagons in turn allude to another difficult and embarrassing truth for the Australia of the First World War. There was a large number of German-style wagons across the country, particularly in South Australia and Queensland, and this was because people of German heritage made up a sizeable part of the population both in and outside the military, and indeed right to the very top of the Army with General Monash.

CONCLUSION

So many military objects are collected and displayed as 'generic artefacts', that is, as examples of equipment that was used in very large numbers in a particular battle, campaign or war. These artefacts fill an important role in the recreating the history of the military conflicts 'on the ground'. The artefacts of war can have a history beyond the battlefield. These objects also embody the assumptions, expectations and abilities of those who ordered, designed and produced them. These actions may have occurred long before the war, or in government offices or factories far removed from 'the front'. The narrative of these objects is not just that of the battlefield, but also the planning, logistics and rationale that made those terrible battles possible.

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WAR OFFICE see *GREAT BRITAIN WAR OFFICE*