

RAILS TO THE FRONT

THE ROLE OF RAILWAYS IN WARTIME

Augustus J. Veenendaal and H. Roger Grant

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Now in the National Railway Museum, York. The image is reproduced in full on pages 128-129.

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FOREWORD

This book originated in the Dutch language with the title *Sporen naar het Front: Spoorwegen en Oorlog*, published in 2013 by W Books of Zwolle. It was written by the Dutchman of the two present authors at the request of the director of the Netherlands Railway Museum of Utrecht, Paul van Vlijmen, to accompany a major exhibition on the role of railroads in wartime over the last centuries. That exhibit in Utrecht in 2013 was a huge success with thousands of visitors and considerable attention in the press and other media.

The Dutch book sold well and received favorable reviews, but the author thought that the subject deserved a wider audience than those who can read only Dutch. So the idea of an English-language translation or adaptation germinated. As the railroads of the United States played a conspicuous role in three wars described in the book, more attention could be paid to the American side of the picture. And who could do that better than H. Roger Grant, one of the leading railroad historians of America? And as it happened that the Dutchman and the American were good friends and had earlier collaborated in a joint effort, the editing of a diary of a young Dutchman, Claude August Crommelin, who visited the United States and Canada in 1866-1867, it was only natural that Roger could write the chapters that covered railroads in the wars where America was involved. He accepted eagerly his role in this book.

We decided to dispense with footnotes or endnotes but provide an extensive bibliography for those readers who would want to check out statements or would wish to delve deeper into the subject. We also thought that illustrations often say more than words, so we have collected a large number of photographs from numerous sources that give a good idea of what the presence of railways meant in a war.

W Books, publisher of the Dutch version, hesitated to bring out an English-language edition as their business experience was mostly limited

to the Dutch-language market. But they did welcome the idea of an English edition and promised to cooperate in all respects. They made the illustrations of the Dutch edition digitally available to us and the new publisher. We were pleased to find one, and we thank Rolof van Hövell tot Westerflier of Karwansaray Books in Rotterdam for his enthusiasm for this project. When we first approached him, he was positive and liked the idea of an expanded English-language book. He has given us his unhesitating support. We want to thank staff member Christy Beall for her assistance. She took care of the acquisition of the images selected by us and requested the necessary permissions where appropriate. Moreover, she took care of the layout, doing a remarkable job. Then Margriet Lacy-Bruijn, our Dutch-American friend from Indianapolis and Maarssen, deserves praise for her work as copy-editor. She polished the English texts of the Dutch author into a coherent body, with critical remarks where necessary and suggestions for improvement.

The people of the Nederlands Spoorwegmuseum of Utrecht were enthusiastic about the project, and they were glad to make photographs from their collections available for this publication. Friends on both sides of the Atlantic, Don Hofsommer and John Gruber in the West and Dirk Eveleens Maarse in the East were happy to supply photographs. We also provided images from our own holdings.

Our wives, Jannie and Martha, may have wished for more diverse subjects of table talk than railways and war, but by now they understand our aberrations and always have supported us without serious complaints. We owe them thanks for their patience, their help, and their critical remarks.

Augustus J. Veenendaal, Jr., 't Harde, Netherlands
H. Roger Grant, Clemson, South Carolina



1 RAILWAYS & WARFARE

early beginnings





Could a newfangled contraption, the iron road or railway, be of any use for military purposes? That was a question asked by military men when the rumors about that new mode of transportation started circulating in the offices of the commanders-in-chief and generals of various countries. But what was that new contraption, the railroad, what did it do and what did it not do? After all, most people had never seen a railway with their own eyes and had to obtain their information from sometimes doubtful sources. It was new, it was fast, it was the wonder of the world, but was it safe or dangerous? Was it really needed or was it superfluous as roads, rivers and canals were already an established means of transportation? Was it going to be a blessing or a curse? Was it going to advance world peace or would it be a reason for war? Both military and civil authorities in every country were wondering what the advantages or disadvantages would be. Philosophers and men of business and trade began to discuss the pros and cons of the rail for civilian purposes, while progressive military officers did the same for their own ends.

The first real test had already been passed in 1830, shortly after the opening of the Liverpool & Manchester Railway on 15 September of that year. A regiment of infantry encamped near Manchester was to be sent out to Ireland to quell one of the frequent disturbances. British rule over Ireland was regularly challenged by Irish nationalists and troops were always stationed there. The quickest way to get from Manchester to Dublin was by way of the port of Liverpool, and the 1,000 men of the regiment, with arms and equipment, were brought there by train in two hours, instead of needing at least two days when they had to

march. And there were no problems with deserters and stragglers. Despite the special low fare the L&M made a profit.

Despite this early success, there was little discussion in Britain about the use of railways in wartime. Of course, a continental war was not contemplated after the defeat of Napoleon at Waterloo and the Royal Navy would prevent any hostile landing on Britain's shores. During 1842, a year of Chartist disturbances, troops were sent from London to the manufacturing districts. In that same year the Board of Trade, in the – second – Regulation Act, had made provisions for the conveyance of troops and equipment by rail and the conditions applying. According to the Quartermaster-General's report in 1844, 118,000 soldiers had been moved by rail about the country during the troubled years 1842 and 1843. A battalion of 1,000 men with equipment could be sent by rail from London to Manchester in nine hours, as had indeed happened in 1842. Marching would have taken seventeen days! The existence of the railway meant that the troops could be concentrated in a few garrison towns, instead of in the new manufacturing towns, where they were seen as a provocative army of occupation during these years of continuing political unrest and class conflicts. Only a few more instances are known of troops conveyed to places of unrest or strikes in Britain later in the nineteenth century.

Some British thinkers soon recognized the opportunities for defense provided by the railway, including even the Commander-in-Chief, the Duke of Wellington of Waterloo fame. In the 1840s he favored building a continuous railway line along the south coast of England, from Dover west to Plymouth, to enable troops to be sent quickly to threatened



(Top) Friedrich List (1789-1846), German economist and journalist, became a great proponent of an economic union of the several German states, and he designed the first comprehensive railway network for Germany. (Private collection)



(Bottom) Friedrich Harckort (1793-1880), German industrialist and railway promoter, took the initiative to construct the important Cöln-Mindener Eisenbahn Gesellschaft, one of the greatest private railway companies in Germany. (Private collection).

points on the south coast in case of an enemy landing. Napoleon's plans for such a landing had not been forgotten, and the French were still distrusted.

In the United States similar thoughts circulated for and against, while a first use of a railway was made in 1832 during the so-called Black Hawk War against Native American tribes, when two companies were dispatched from Virginia to Chicago, partly by rail. According to the commanding officer, Major-General Alexander Macomb, this was done with "a rapidity which is believed to be unprecedented in military movements." Another forward thinker was General Edmund P. Gaines, commander since 1830 of the U.S. Army's western department. He recommended construction of an integrated, nationwide system of railroads to transport troops to threatened points in a couple of days. In this way, outlying garrisons could be abolished and replaced by a centrally located mobile body of troops that could be transported anywhere in the country by this new medium. During the Second Seminole War of 1836 a body of 1,000 Baltimore volunteers was taken to Washington DC and back in one day, a journey that would have cost at least four days on foot. Despite this success, the War Department and Congress ignored Gaines, and the general public was always averse to government meddling in what were considered local or regional interests. Only the Civil War was to change these attitudes of *laissez faire* in railroad matters.

In Germany even more discussion about the use of railways in wartime was going on. In 1833 an anonymous optimist wrote in a pamphlet that the coming of the railway meant that there would be no more wars. His argument was that every nation could now dispatch thousands of soldiers to threatened points on its borders in time to ward off a hostile attack. This writer failed to mention, however, that an aggressor would similarly be able to concentrate his troops quickly on a border by making use of that same medium of transportation. Friedrich List (1789-1846), the well-known economist, business man, and journalist, joined in the discussion and agreed that the railroad would be more useful for defensive purposes than for an attack. Another German industrialist, Friedrich Harkort (1793-1880), founder of



the important Cöln-Mindener Railway, lobbied for the construction of railroads and stressed their importance for military purposes. Now that Prussia had acquired at the Congress of Vienna the whole of the Ruhr area, fairly distant from Berlin and then already heavily industrialized, a railway was needed to tie the two regions together and also for speeding up the movement of troops in case of necessity.

A Saxon officer, Karl E. Pölnitz, published a book in 1842 in which he detailed the use of railways in case of war. He did not expect great changes, but he opined that fresh troops could be transported quickly to any point threatened by an enemy. He who was best able to mobilize the railroads for his purposes would have a distinct advantage. Soon Pölnitz would be proved right in practice. However, in other countries the leading generals and politicians were not so sure that the rail could make a difference in wartime. As usual these gentlemen were fighting earlier wars over and over again. Was it not true that Napoleon had achieved his victories without the use of railways? Napoleon knew well that an army marched on its stomach, and he took care that the commissariat was operating adequately when possible at all. It was a lesson that was soon to be forgotten again. Furthermore critics doubted the dependability of the new means of transportation,

During the Chartist disturbances of 1842 in Great Britain, the government used railways to concentrate troops in the districts most affected. Here troops embark at Euston Station of the London & Birmingham Railway for conveyance to the north. Protesters are being kept at a distance by railway police. (From Illustrated London News, 1842)

not quite without reason, for on the primitive early railways trains frequently broke down. But with the growth of the European network and better equipment and improved performance, they had to admit that in the future railroads could possibly play a useful role for transportation of food, ammunition, and stores to armies in the field.

Britain was the first country to put these possibilities into practice, as we have seen above, but, of course, it was also the first to develop a real railway network. The Austro-Hungarian Empire followed soon, in 1846, when 14,500 men, with horses and kit, were transported from Bohemia to Krakow, then – since 1764 – a sort of independent republic, to quell the nationalistic insurrection there. It took the trains two days to cover the 300 kilometers, and the soldiers arrived well-rested and fit. On foot this operation would have required weeks, and the soldiers would have arrived worn out and poorly prepared for immediate service, not to mention the risk of sickness and desertion. With the insurrection ended by force, the *Freistaat* Krakow was abolished and city and surrounding territory integrated into the Austrian Empire. Three years later, the Austrians repeated this with the movement of troops into Italy. In May 1849 they used the short line – 60 kilometers – between Vicenza and Mestre for troop transports in the brief war with the kingdom of Sardinia-Piedmont. In those years almost all of northern Italy – Lombardy and Venice – was Austrian, but Piedmont tried to throw the Austrians out and unite all of Italy under the king of Sardinia-Piedmont. More wars were to follow in Italy after 1849.

Revolutions and Railways

The year 1848 saw many democratic revolutions in Europe. In France the monarchy was overthrown, but there is no record of the use of trains by the various parties involved. In Germany it was different; there the railways played an important role. The revolutionaries used the rail to bring together masses of supporters for propaganda speeches, more than 30,000 in one instance. They also commandeered trains for their own purposes, just as the other side did. The

threatened governments in several German states, especially Prussia, employed trains to rush troops to the centers of the democratic movement, such as Frankfurt am Main, and the largely private railway companies saw their normal traffic reduced to almost nothing, while military transports received preferential treatment. The revolutionaries soon learned to obstruct these military movements by loosening fishplates or wrecking turnouts. Troop trains were derailed and even the new bridge of the Main-Neckar Eisenbahn across the Neckar River between Mannheim and Heidelberg was put out of order. The repair bill had to be footed by the shareholders. The railway stations also served as appropriate places for the congregation of large numbers of people, as few other places in most towns were suitable for the reception of hundreds of insurgents and their followers. The churches generally remained closed.

In the Kingdom of Saxony the democratic agitation led to a popular rising in the capital, Dresden, in May 1849. Barricades were raised and manned by the revolutionaries, among whom Richard Wagner, then leader of the Dresden Chapel Royal, played a conspicuous role. The Saxon king asked his fellow king in Berlin for assistance, and three railway trains brought Prussian troops into the city who put a quick and bloody end to the rising. With many others, Wagner had to flee the country and found safety in Zürich.

In Hungary the revolutionary movement was so strong that the Austrian government had great difficulty suppressing it. The newly installed Emperor Francis Joseph (†1916) had to call in the help of his reactionary colleague, Tsar Nicholas I of Russia. The tsar was happy to oblige and sent an army of 30,000 men by rail over the Warschau-Wiener Eisenbahn, opened for traffic only weeks before, to end the disturbances. Warschau – Warszawa – was then the capital of Russian Poland and this railway line was constructed in the European standard gauge, not in the Russian broad gauge, because of the links with other standard gauge lines in central Europe. The Russian troops made themselves most unpopular because of their harsh treatment of the Hungarians.



During the revolutionary years of 1848-49 in Germany, the delegates to the several democratic congregations gladly used the railways. At Mannheim station well-dressed ladies decorate departing delegates with black-red-gold rosettes. (Archiv für Kunst und Geschichte, Berlin)

Austria in Italy

Austrians used the rail also to quell the next insurrection of Italian nationalists in the province of Venice. The city of Venice itself was in the hands of insurgents, who tried to hinder the movement of the Austrian army by blowing up several arches of the viaduct linking the city with the mainland. That viaduct, consisting of 222 brick arches

with a length of more than three kilometers across the sea and the marshes, had been opened in 1844 by the – Austrian – *Lombardisch-Venetianischen Ferdinands Eisenbahn Gesellschaft* and was considered a wonder of modern technology. Although the Austrians had thus shown how to use a railway in wartime, they made a complete mess of the next large-scale transport in 1850 when troops had to be sent

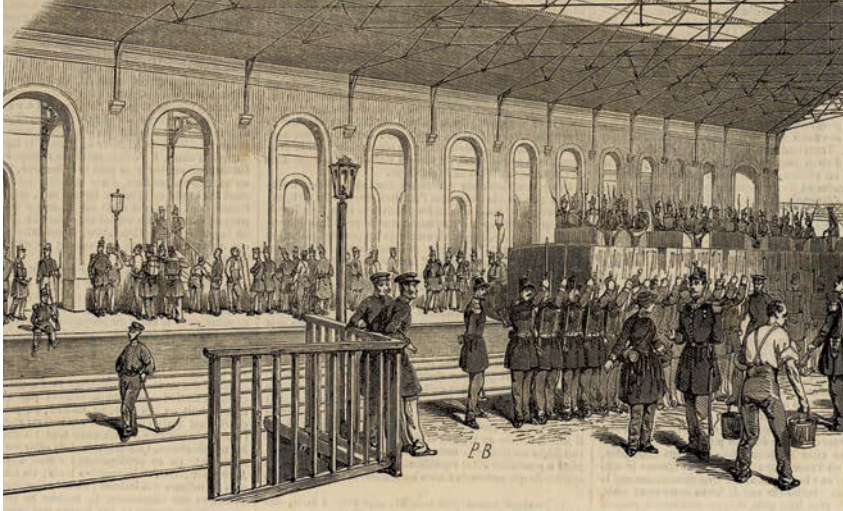
In 1844 the great railway viaduct connecting the city of Venice with the mainland opened. Over three kilometers long it was constructed with 220 masonry arches through the shallow water and was considered a wonder of modern engineering. The last section of the line Venice-Milan, belonging to the – Austrian – Lombardisch-Venetianischen Ferdinands Eisenbahn Gesellschaft opened in 1857. (Private collection)



from Vienna towards Bohemia to quell disturbances. An army of 75,000 men together with 8,000 horses was sent by rail, a distance of not more than 230 kilometers, but it took 26 days to complete this journey. Marching would have been faster. The weather had been bad, and there was not enough railway personnel. Also, there was insufficient rolling stock, only single-track lines, and a conspicuous

lack of planning and organization. The combination of all these elements caused the bad performance.

Italy remained a thorn in Austria's side. 'Italy for the Italians' was the slogan and the kingdom of Sardinia-Piedmont was the force behind this. By itself Sardinia was not strong enough to chase the Austrians out of Lombardy and Venetia, but the French Emperor



Napoleon III, always looking for opportunities to enhance his recently acquired position as a great monarch, came to the rescue. He had already made a name for himself as Great Britain's ally during the Crimean War against Russia, which will be described in the next chapter. Now he was out for more glory and came out in support of Sardinia in 1859. For security reasons the Austrians had expelled all foreign personnel on their railways in Lombardy, and the Italians made skilful use of this temporary lack of experienced staff on the Austrian side. The Piedmontese railways transported some 200,000 troops in ten days, a creditable performance. The French government managed to send 250,000 men by rail from northern France to Marseille; from there they traveled to Genoa by ship and then on into Lombardy by rail again. The Paris-Lyon-Méditerranée Railway played an important role in these movements and managed the business quite well in this emergency situation. The French-Italian armies also used the rail to outflank the Austrian armies before the Battle of Magenta in June 1859. The humanitarian role of railways was highlighted after that battle and even more so after the Battle of Solferino, by transporting wounded soldiers to hospitals in Turin and Milan. The Austrians had sabotaged the railway line between Milan and Peschiera, but quick repairs enabled the Italians to convey the wounded to the hospitals. Nevertheless Henri Dunant, the neutral Swiss observer at the Battle of Solferino of 24 June 1860,

was appalled at the sight of the thousands of wounded, on both sides, who were left on the battlefield without medical care and without water and food to die a horrible death. To eradicate this evil he came up with the idea of an absolutely neutral organization to provide care for soldiers and civilians in conflicts and natural disasters without distinction of party, color, or religion. The International Red Cross was born, and the sign of the Red Cross, the inverse of the Swiss flag, has since meant rescue and safety for millions.

On the surface it seemed that the French and Sardinian generals had learned the lesson of how to employ railways, but there were mistakes and problems. While men and horses were generally brought to the battlefield in time for the actual fighting, the supply of ammunition, food and fodder, medical goods, and other equipment left much to be desired. Men, exhausted and hungry after the battle, had to scourge the countryside for food and help for the wounded because the generals had forgotten to make sure that the follow-up was also well organized. Apparently everyone had to get adjusted to the new possibilities.

The Austrians had similar problems. They had only one railway line crossing the Alps, the famous Semmering line that had been finished and brought into working order only a few years earlier, to cater for the needs of their armies in Italy. But that line had steep grades, slow and feeble locomotives, and freight wagons were only available in small numbers, resulting in an inadequate supply of food and am-

(Left) An image of an undated but early troop transport somewhere in France. Soldiers are everywhere in the station, and a train has been loaded and stands ready for departure. It looks primitive, and the men with their high hats on the roofs of the coaches will have a rough and cold ride.

(Nederlands Spoorwegmuseum, Utrecht)

(Right) A sharp fight for a railway line at an unspecified place during the Prussian-Austrian War of 1866. The roadbed is wide enough for double track, but only one set of rails has been laid, a common practice with early railways. Mounted cavalry seems to bear the brunt of the fighting.

(Private collection)

The Kingdom of Saxony was allied to Austria during the Prussian-Austrian War of 1866. Before being overrun by the Prussian armies, the Saxon State Railways managed to bring many steam locomotives to safety out of reach of the Prussians in the station of Eger, Bohemia, now known as Cheb, Czech Republic. Long lines of locomotives, some of them in steam, seem to choke the through tracks.
(Private collection)

munition for the armies in the field. Commanding officers also used to keep goods vehicles in sidings as storehouses rather than sending them back quickly for reloading. In this respect the Austrians were certainly not the only ones to make a wrong use of the railway. The outcome of the war was that Austria had to give up Lombardy with Milan, but it kept Venetia province. As a reward for his help the French emperor acquired Savoy and Nice from Sardinia-Piedmont. Italian Nizza became French Nice.

Yet another war would be needed to finally unite Italy. The kingdom of Italy was officially proclaimed in 1861, and in 1866 it sided with Prussia in the German internecine struggle against Austria, about which more later. This meant that Austria was attacked from both the north and the south. The line over the Brenner Pass was only partially open at that time and was used by the Austrians for moving troops south, while Italy transported more than 115,000 men in two weeks to the front. There was some desultory fighting, and in the end Austria evacuated the whole province of Venetia with the exception of the city and port of Trieste.

Until then the Papal States had been protected by French troops, but in 1870, with a war in his own country, Emperor Napoleon III withdrew his troops from Rome. Papal troops blew up the railway

lines – operated by a French company – leading into the city, but the Italian nationalists easily occupied Rome anyway. Finally Italy was united and Rome was proclaimed capital of the Italian kingdom. The pope became the ‘prisoner of the Vatican.’

Railways and War in Germany

The discussion in Germany about how to use the railways had been going on since the early 1830s. In those years Germany was still a conglomerate of independent kingdoms, grand duchies and such, large and small, with Prussia in the ascendant. Leadership over all German states continued to be disputed between Prussia and Austria and was as yet undecided. Prussia was slow to copy the example set by Austria against Italy. However, in 1859 a dress rehearsal of sorts had already been carried out. Prussian troops in the Rhine region had been mobilized during the war in Italy where the army of Sardinia-Piedmont was supported by French troops. As a precaution against a possible French invasion the Prussians mobilized but not a shot was fired.

In 1864, when Prussia, this time assisted by Austria, mobilized its army against Denmark to recover the duchies of Schleswig and Holstein, railroads played only a minor role. But despite some chaos the Prussians managed to send 15,000 men with their kit and a few thou-





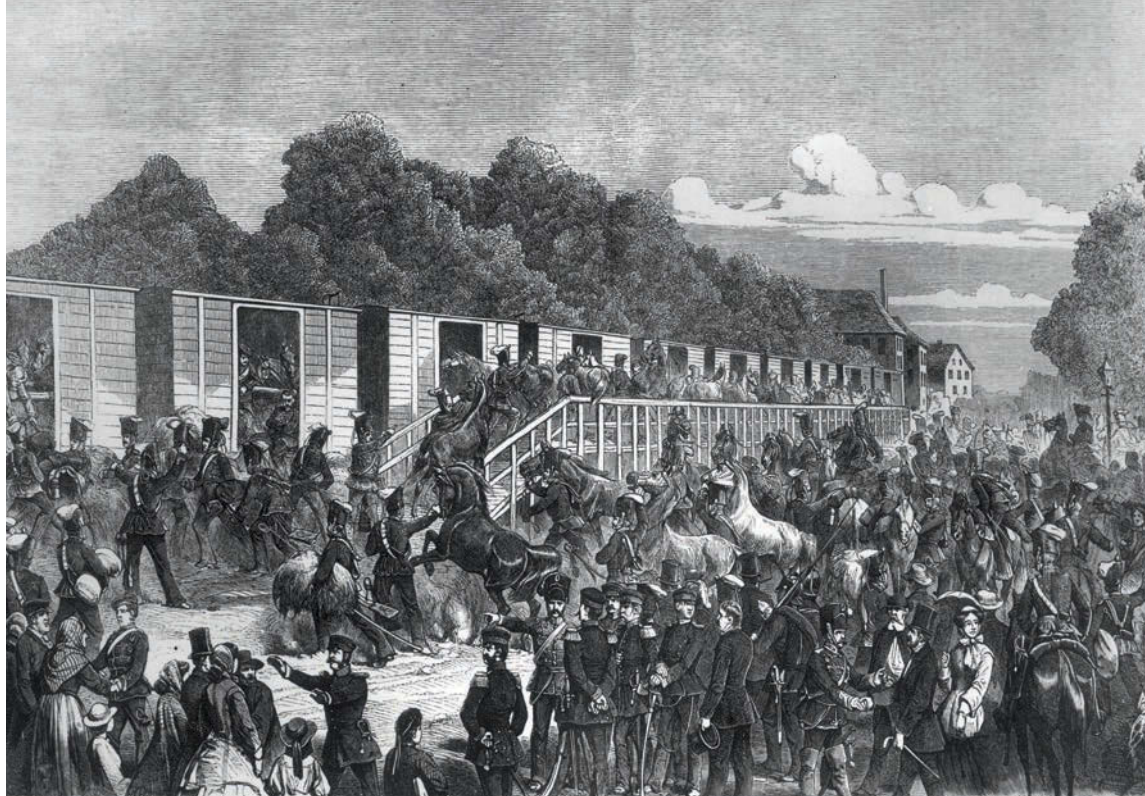
Arrival of a section of the Prussian Cuirassier Guards at the Oberschlesische station of Breslau, then in Prussia, for service against the Austrians. Breslau is now known as Wrocław, Poland.

(Private collection)

sand horses in 42 trains from Minden, near Hanover, to Harburg opposite Hamburg on the other bank of the Elbe. The distance was some 250 kilometers, and it took five days to get the troops there, a creditable performance. The war was soon won, and with the Peace of Vienna the Danes had to hand over the two duchies to a joint Prussian-Austrian interim government. The early – then Danish – Altona-Kieler Railway, constructed by Sir Samuel Morton Peto, the well-known English con-

tractor, was included in the deal. The experiences gained in this Prusso-Danish war served as a rehearsal for the next war.

The struggle for supremacy in the German states between Prussia and Austria came to a head in 1866. Under the ‘iron’ Chancellor Otto von Bismarck Prussia was well on its way to gain first place at the expense of Austria, and Chief-of-Staff Helmuth von Moltke (senior) had made his preparations well. Back in 1843 Moltke, then



Embarkation of the 11th Westphalian Hussar Regiment at the station of Düsseldorf for transportation to the borders with Austria in 1866. Men and horses are indiscriminately conveyed in goods wagons. For officers a better mode of conveyance was generally provided. (Private collection)

a junior officer, had written: “Every new development in railways is a military advantage ... and for the national defense a few million on the completion of our railways is far more profitably employed than on our fortresses.” The electromagnetic telegraph was the second instrument in the transportation revolution begun by the railways, and Moltke soon recognized its usefulness. In 1864 and 1866 – and again in 1870–71, about which more later – railways and telegraphs were put under the command of the Prussian General Staff. Careful planning enabled mobilization and deployment to be carried out with unprecedented effectiveness, so much so that a huge military advantage was acquired before the first shot was fired.

There was no national railways system yet in Prussia, but Moltke could use five railway lines of different companies to bring his armies, totaling 280,000 men, to the front in Saxony and Bohemia in five days. By contrast, the Austrians had only one railway line available to transport 210,000 men to the front. It took them much longer, but on both sides

there were major problems. Even when it was possible to move men and horses speedily, it took much more time to supply the food for the soldiers and the immense quantities of hay and fodder for the horses. And as long as horses were still needed by the thousands for the cavalry and also for the last miles of transportation from the railway stations to the front, the amounts of fodder needed for them were staggering. Well into World War I this would remain the weakest point of every army.

Although the first transports went well, and the troops were in place on time, there soon was chaos. Already after a few days of the Prussian advance into Saxony – the ally of Austria – the railways became choked with traffic, with trains full of food and fodder standing still on the lines, supplies being unloaded at the wrong station, and soldiers at the front left without ammunition. The sick and wounded could not be brought home to the hospitals because the railroad lines – mostly single track – were blocked. It was fortunate for Moltke that on the Austrian side the chaos was even greater. The Battle of Königgratz – present-day Hradec Králové, east of Prague – of 3 July 1866, won by the Prussians, put a quick end to the conflict. Again the rail had played an important part in the course of the war, but too much improvisation had been needed despite Moltke’s meticulous planning. Important lessons were learned for the next war. From then on Austria was more or less an outsider in Germany, and Prussia the unchallenged leader of the smaller German states.

Prussia had a big advantage in its *Feldeisenbahnabteilung*, a corps consisting of officers and soldiers drawn from the Corps of Engineers and supported by experienced railway staff. Moltke had organized three separate sections, each with its own dedicated train with equipment, tools and materials to be able to reconstruct destroyed bridges and railway lines quickly and restore service. The Austrians acutely felt the need for something similar during the conflict.

As early as the 1850s Prussian military authorities began to get nervous about the far-off garrison town of Königsberg – present-day Kaliningrad, Russia – in East Prussia. That ancient fortress town was



In 1870 Prussian infantry storm a railway embankment near Amiens during the Franco-Prussian War. Dead and wounded are lying around, but the music of kettle drums and trumpets urges the men forward.

(Bildarchiv Preussischer Kulturbesitz)

a kind of outpost of Prussian power but difficult to reach over land and consequently impossible to reinforce in case of a Russian offensive. In 1847 a start had been made with the building of the *Ostbahn*, the Royal Prussian Eastern Railway, but the state had not been able to find private parties willing to participate in the expenses of constructing a line through lightly developed, mostly agricultural country. In 1848, however, a new government managed to obtain a large loan approved by the Berlin parliament, and work was resumed by the state. Rails

reached Königsberg in 1853, and in 1867 the line from Berlin to the Russian border at Eydtkuhnen – present-day Chernyshevskoye, Russia – was ready. Wirballen – present-day Virbalis, Lithuania – on the other side of the border was the first Russian station. Through traffic was impossible because of the wider Russian rail gauge, and installations to change the wheels of carriages without disturbing the passengers came later. The military authorities could relax, for despite being largely single tracked, the *Ostbahn* made it possible to keep the Russian bear

The transportation of horses by rail was always something to be carefully prepared if the horses were to arrive in good health on the battlefield. On every German – and French – goods vehicle the number of men or horses to be accommodated was clearly painted. These Prussian soldiers have loaded their horses in a wagon of the Berlin-Anhaltische Eisenbahn and now have time for a smoke and a drink. (Private collection)



at a distance. It was a railway born first and foremost out of military necessity; its economic importance was recognized only later.

The Franco-Prussian War

The ultimate test of Moltke's preparations came with the war against France in 1870. Both belligerents had made extensive preparations for the use of railways and the French were generally thought to have a slight advantage in this respect. The railways leading to the German border were mostly double tracked and only a single company was involved, the *Compagnie de l'Est*, which would bear the brunt of the traffic, making for easier organization. On the German side more than one railway company was involved, in some cases with single track only, and the number of bridges across the Rhine was insufficient. Despite this, thanks to Moltke's meticulous preparations, in eighteen days after the beginning of the mobilization on 14 July, more than 400,000 men had been transported to the front.

On the other side, between 16 and 27 July 1870, the *Compagnie de l'Est* with 594 trains managed to bring 186,000 men to the front, with more than 32,000 horses and 4,000 artillery pieces. Yet, there were problems. Troops were delivered at the wrong station, regiments were transported in several trains with different destinations, and the commanding officers completely lost track of the situation. Although it seemed that the Germans had done better than the French, their organization was certainly not perfect either. Supplies for the front-line troops came in too slowly – the usual problem – and wounded could not be sent back to hospitals with the necessary expedience. The real shooting war was short and with the Battle of Sedan of 31 August 1870,

the French Emperor Napoleon III was taken prisoner and French resistance almost came to an end. The French Second Empire was abolished and replaced by the Third Republic.

Some important fortresses, however, such as Metz and Belfort, remained in French hands. The railway lines commanded by these strongholds could not be used by the German armies on their march into France to lay siege to Paris. Here a fatal flaw in the German logistics came to light. Moltke had not reckoned with a long war, and with longer lines of communication the supplies for the troops came in later every day. Moreover the French sabotaged the railroads where possible, destroying bridges and tunnels, and they even managed to blow up a complete train carrying soldiers between Reims and Metz, resulting in hundreds of casualties on the German side. The Germans encountered other unexpected problems when trying to use the French rails. They had to bring in their own locomotives and rolling stock as the French had managed to get most of their locomotives out of German reach. The *Compagnie du Nord* had brought hundreds of its engines over the border into safety in neutral Belgium. The French loading gauge was smaller and lower than the German one, which meant that locomotives had their chimneys and safety valves knocked off under low overbridges and in tunnels.

The result was that German troops had to live off the land, as it was euphemistically called. It meant that they took what they needed from French civilians and farmers, making themselves distinctly unpopular. Moltke had never thought of a long war over the distances that this one had become, as he had only figured out the transportation of the troops to the borders of France, not with a drawn-out war far from the home depots.

With so many freight vehicles in use by the German military authorities, a severe lack of rolling stock made itself felt, and goods traffic at home suffered. Foreign vehicles, chiefly Belgian and Dutch, that happened to be somewhere in Germany were retained by the authorities and used by the military, causing a severe shortage of goods wagons in those two countries. Traffic from the ports of Antwerp, Rotterdam, and Amsterdam suddenly surged because the French had declared the German North Sea and Baltic



ports blockaded. Although the French did not have enough warships to actually close off all these German ports, timid foreign exporters chose the safest way to avoid any risk by bringing their goods for Germany to the neutral ports of Belgium and the Netherlands. Chaos resulted. After the war Germany paid an indemnity to the railway companies involved.

Conclusion

The Franco-Prussian war had shown all the old problems of 1866 again, and critics were not slow to point out what had gone wrong. In both

countries lessons were drawn from the conflict to avoid similar mistakes in the future. And both sides fully expected a repetition of fighting in the future since France never acquiesced to the loss of Alsace and Lorraine that the Peace of Frankfurt of 1871 forced it to cede to Germany.

Two other wars were fought in the 1850s and 1860s, the Crimean War and the American Civil War. In both conflicts railways played such an important role that they deserve special coverage. Peace in continental Europe would last until 1914, but in other parts of the world war was to be an almost permanent occurrence.

A scene from the Franco-Prussian War of 1870-71. French soldiers are being surprised by the sudden appearance of an enemy military train.

(Bildarchiv Preussischer Kulturbesitz)

“The North can make a steam engine, locomotive, or railway car [...] You are rushing into war with one of the most powerful, ingeniously mechanical, and determined people on Earth — right at your doors.”

– William Tecumseh Sherman, 1860

For centuries, innovation in technology has continued to transform the world of warfare. In the mid-nineteenth century, the burgeoning railway industry began to make an increasingly significant contribution.

The military used railways because of their capacity to transport quickly and, less commonly, as a means for military action in their own right, such as armoured trains. The steam locomotive proved far superior to animal-drawn equipment in transporting troops and their military supplies, especially heavy weaponry.

In *Rails to the Front*, historians Augustus J. Veenendaal and H. Roger Grant examine the critical impact of railways in a series of conflicts worldwide, from the failed German revolutions in the 1840s and Crimean War, right through to World Wars I and II and the Gulf War in the 1990s. This lavishly illustrated and readable study is the first of its kind in English.

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