

The Rear of the Red Army during the German-Soviet War 1941-1945

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Articles in order

Background:

H.G.W. Davie, 'Patterns of War: A Re-Interpretation of the Chronology of the German-Soviet War 1941–1945', *The Journal of Slavic Military Studies* 36, no. 2 (2023): 139–63, <https://doi.org/10.1080/13518046.2023.2251305>.

H.G.W. Davie, 'The Economics and Logistics of Horse-Drawn Armies', *British Journal for Military History* 7, no. 1 (3 August 2021): 21–45, <https://doi.org/10.25602/GOLD.bjmh.v7i1.1466>.

H.G.W. Davie, 'Logistics of the Combined-Arms Army — Motor Transport', *The Journal of Slavic Military Studies* 31, no. 4 (October 2018): 474–501, <https://doi.org/10.1080/13518046.2018.1521360>.

H.G.W. Davie, 'Mechanized Corps – a Study in Mobility and Transport', *The Journal of Slavic Military Studies* 34, no. 2 (3 April 2021): 226–50, <https://doi.org/10.1080/13518046.2021.1990556>.

Supply and transport at the army level:

H.G.W. Davie, 'Logistics of the Combined-Arms Army— the Rear: High Mobility Through Limited Means', *The Journal of Slavic Military Studies* 33, no. 4 (1 October 2020): 580–607, <https://doi.org/10.1080/13518046.2020.1845091>.

H.G.W. Davie, 'Logistics of the Tank Army: The Uman–Botoșani Operation, 1944', *The Journal of Slavic Military Studies* 33, no. 3 (2 July 2020): 420–41, <https://doi.org/10.1080/13518046.2020.1824106>.

Supply and transport at the high command level:

H.G.W. Davie, 'Logistics of the Front: The Power of Distribution', *Journal of Slavic Military Studies*, online 21 Nov 2025, <https://doi.org/10.1080/13518046.2025.2585667>.

H.G.W. Davie, 'Managing Shortage: The Role of Centre Bases of the NKO in Overcoming Supply Constraints in the Red Army, 1941–1945', *The Journal of Slavic Military Studies* 37, no. 1 (1 February 2024): 53–79, <https://doi.org/10.1080/13518046.2024.2340837>.

H.G.W. Davie, 'The Influence of Railways on Military Operations in the Russo-German War 1941–1945', *The Journal of Slavic Military Studies* 30, no. 2 (3 April 2017): 321–46, <https://doi.org/10.1080/13518046.2017.1308120>.

Glossary

Chef des Transportwesens Chief of military transport, General Gerke, OKW

DRB *Deutsche Reichsbahn* Railway within the German Reich

EBP *Eisenbahnpioniere* German Army railway troops, capable of both restoring and operating captured railways

Ersatzheer Replacement Army based in Germany and ran the military administration of the home base

FED *Feldeisenbahndirektion* Field Railway Directorate – Army rear railway operating unit, later renamed FedKo

FedKo *Feld Eisenbahn Direktion Kommando* see FED

GABTU Main Directorate of Armoured & Mechanised Forces of the Red Army

GAU Main Directorate of Artillery of the Red Army

GUTKA Main Directorate of the Rear of the Red Army, from 1943 renamed as Office of the Chief of the Rear of the Red Army

GDR German Democratic Republic

Gedob *General Direktion der Ost Bahn* Railway of the Government General in German occupied Poland

General Quartiermeister Quartermaster General in charge of supply for OKH

GKO State Defence Committee

GTR *Gross Transport Raum* or Large Transport Area. Long-distance lorry units of German Army, Regiments 602, 605, 616, plus independent units. Used 6, 8 and 10 tonne lorries with trailers.

GUTKA Main Directorate of the Rear of the Red Army from 1943 its name was changed to Office of the Chief of the Rear

HBD	<i>Haupt Eisenbahn Direktion</i> Railways of the <i>Reichskommissariat</i> in occupied. Later renamed RVD
<i>Nachschub</i>	German Army term for transportation of supplies
<i>Nachschubtruppe</i>	Supply Troops. Term refers to an 'arm of service'
NSKK	<i>Nationalsozialistisches Kraftfahrkorps</i> or National-Socialist-Motor-Corps, the Party motor transport organisation
MGFA	<i>Militärgeschichtliches Forschungsamt</i> (since 2013 ZMSBw) German Army Supply Service
NKO	People's Commissariat of Defence or People's Commissar of Defence
NKPS	Narodnyi Kommissariat Putei Soobshchenia or People's Commissariat of the Means of Communication (by 1941 railways and inland waterways, as roads were under NKVD)
NKVD	People's Commissariat for Internal Security
<i>Reichskommissariat</i>	Administrative districts of German occupied Soviet Union
RVD	<i>Reichs Verkehr Direktion</i> see HBD
RVGK	Reserve of the High Command
RVM	<i>Reich Verkehrs Ministerium</i> or Reich Ministry of Transport
SASO	US Army Soviet Army Studies Office, Fort Leavenworth
SNCF	<i>Société Nationale des Chemins-der-Fer</i> French national railway company
SSRC	Soviet Studies Research Centre, Library, Sandhurst Military Academy
<i>Stavka VGK</i>	Command of the Supreme Headquarters of the Red Army
The Centre	Soviet terminology for national command and its associated institutions
The Rear	Soviet terminology for the interior of the country or the 'Home Front'
TsAMO RF	Central Archive of the Ministry of Defence of the Russian Federation

<i>Versorgung</i>	German Army term for administration of supplies. See Nachschub
<i>Versorgungsbezirk</i>	Supply District. Large grouping of depots and facilities for Army Groups
VOSO	Military Communications Service of the Red Army. Controlled military use of railways
ZMSBw	Zentrum für Militärgeschichte und Sozialwissenschaften der Bundeswehr

The Rear of the Red Army during the German-Soviet War 1941-1945

Introduction

Following the invasion of the Soviet Union, in the late summer of 1941, the Soviet Union was faced with a strategic dilemma; it had created a doctrine for and mobilised a substantial army to fight a large-scale European war, however the grievous losses in industrial and agricultural production threatened its ability to fight such a war. The dilemma was resolved through an efficient, rational allocation of the limited resources using the mechanism of the Main Directorate of the Rear of the Red Army (*GUTKA*) known as the 'Rear'. This allowed the Soviet Union to make the most of its limited resources and ensured that as little as possible was tied up in warehouses or left on quiet sectors of the front-line. To date, this subject has not received the level of historical investigation that it deserves and so this paper makes a distinct contribution to the existing historiography.

Research objectives

The research objectives of the thesis were to provide a basic explanation of the logistical methods and techniques used by the Red Army during the German-Soviet War 1941-1945. Secondly, to understand how these techniques delivered, and constrained the mobility of the army at the operational and strategic levels. Finally, it sought to understand the link between the Rear and the national economy, its role in distributing the production of factories and farms to the front-line troops.

In order to do this, the thesis looked at the following research questions:

- 1) What was the true size, scale and tempo of the German-Soviet War 1941-1945, so that an accurate measure of the logistical task facing the high command could be assessed?
- 2) Since the Red Army used a great many horses in the 1941-1945 period, how did horse-drawn armies move themselves after the adoption of railways and how did they integrate motor vehicles? To further explore the effect of motorisation on the Red Army, it was decided to examine the state of the motor industry and vehicle fleet of the Soviet Union during the period from 1928 until 1945, in order to understand the influence of Lend-lease motor vehicles on the Soviet armed forces.
- 3) What organisational methods were used to deliver supplies to both armies and front in the field and what different transport methods were used in this scheme? What consequences arose from this chosen delivery method, were these mitigated by other factors and what level of mobility did this deliver?
- 4) How did the Rear integrate at all command levels to fulfil its task of delivering and managing supplies? How did the Staff of the Rear interact both with the armies/fronts, with the High Command and the national economy?

For reasons of space, this thesis only considered broad mechanisms, rather than a full survey of methods of transport and supply for all types of commodities and uses. For the same reason, themes such as the airforces, medical and veterinary support were excluded from the study. The period 1941-1945 was chosen because the formation of the Main Directorate of the Rear on 1st August 1941, drew little inspiration from earlier organisations, such as were used in the occupation of Poland in 1939 or the Finnish War in 1940 which had failed to provide an adequate level of logistics to the

Red Army during its operations.

Thesis structure

The publications making up this thesis, fall into three broad categories; one group addresses conceptual problems around transport, the size and scale of the war ;¹ the second group studies the detail of supply and transport at the army level and how this delivers the ‘operational army’s’ mobility;² a third group studies the higher command levels and how these contributed to mobility and managed the resource allocation of scarce supplies to the ‘operational army’.³ Between them, these three groups build a picture of the role of the Rear that shows both its detailed operation, as well as its overall influence on the war at the national level.

The first group of articles have a solid evidence base from both Western and Soviet sources and the ‘material balance’ methodology is ideally suited to studying a Soviet economic system. The articles exploit the flaws in earlier studies; particularly when they do not make allowance for the increase in the size of the army between 1941 and 1943, when charting the growth of the motor vehicles fleet. The large

¹ Davie, ‘Patterns of War: A Re-Interpretation of the Chronology of the German-Soviet War 1941–1945’; Davie, ‘The Economics and Logistics of Horse-Drawn Armies’; Davie, ‘Mechanized Corps – a Study in Mobility and Transport’, *The Journal of Slavic Military Studies* 34, no. 2 (3 April 2021): 226–50; Davie, ‘Logistics of the Combined-Arms Army — Motor Transport’.

² Davie, ‘The Logistics of the Combined-Arms Army— the Rear’; Davie, ‘Logistics of the Tank Army’; Davie, ‘Logistics of the Front: The Power of Distribution’, *Journal of Slavic Military Studies*, online 21 Nov 2025.

³ Davie, ‘Managing Shortage: The Role of Centre Bases of the NKO in Overcoming Supply Constraints in the Red Army, 1941–1945’, *The Journal of Slavic Military Studies* 37, no. 1 (1 February 2024): 53–79; Davie, ‘The Influence of Railways on Military Operations in the Russo-German War 1941–1945’.

increase in size of both the armed forces and operational army outstripped the modest growth in vehicle numbers which reveals the real lack of motorisation in the Red Army. The most damning evidence for the lack of motorisation in the Red Army is from the *Mechanised Corps* article; this used primary source materials to show that mechanised corps were considerably under-strength in vehicles and even so, the corps had been established from their inception, with marching infantry not carried in vehicles.

The second group of articles consider the operations conducted at army level, both combined-arms armies making an initial attack and breach of the enemy defences and the later exploitation by a tank army. These articles drew heavily on the 'Experience of War' studies of the General Staff and supported by primary source documents from *Pamyat Naroda*, such as the daily supply status reports;⁴ between them these documents allowed a complete picture of the supply position to be built up as it changed during the course of the operation. Despite the credibility of the evidence, it represents only a snapshot of a particular army on a specific set of dates. The *Experience of War* reports covered less than thirty operations out of a total over 325 and they were skewed towards the end of the war, with less information about 1941 and 1942. Similarly, the TsAMO documents from the *Pamyat Naroda* website usually covered a small number of units in some detail, fragments from a wider range of other units and nothing for the rest.

The third group of articles had a more diverse range of sources; the Front article used the *Experience of War* and *Pamyat Naroda* documents as detailed above and

⁴ 'Svodka material'nogo obespecheniia chastei i soedinenii 7 gv. A', 1 August 1943, Fond:341, Opus:5312, Delo:243, List:119, TsAMO, <https://pamyat-naroda.ru/documents/view/?id=133390147>.

suffered from the same limitations. By contrast, the 'Centre Bases of the NKO' article started from a single article in *Voenno-Istoricheskii Zhurnal* and a further reference in General Golushko's book on the Staff of the Rear.⁵ Finding supporting evidence was difficult and individual mentions or references were scattered across a wide range of supporting secondary and a small number of primary sources. However, a major source was provided by the TsAMO archive in Poldolsk, which was General Khrulev's original order concerning the management of the Centre Bases.⁶

By contrast the evidence base for the *Patterns of War* article was quite wide, although largely gained from secondary sources. The core of the 'canon of operations' was provided by official publications of the General Staff and by David Glantz's self-published six volume work on the subject.⁷ This list was added to from the 1986 debate in *Voenno-Istoricheskii Zhurnal*,⁸ passing references in Krivosheev's books on

⁵ Skryabin, 'Sozдание baz snabzheniia Tsentra'; I. M Golushko, *Shtab Tyla Krasnoï Armii v gody voïny 1941-1945* (Moskva: Ekonomika i informatika, 1998).

⁶ A.V. Khrulev, 'Prikaz Narodnogo Komissara Oborony Soiūza SSR № 112 S Ob'iazleniem «Polozheniia Ob Upravlenii Bazy Tsenera NKO v Voennoe Vremia».', 12 April 1942, Fond:2 Opus:920266 Delo:4 Listi:282, 282ob, TsAMO.

⁷ S.P. Planonov, *Operatsii Sovetskikh Vooruzhennykh sil v Velikoï Otechestvennoï voïne 1941-1945 gg. (Voenno-istoricheskii ocherk): V 4 tomakh*, (Moskva: Voenizdat, 1958); Pavel Andreevich Zhilin, *Vazhneishie operatsii Velikoï Otechestvennoï voïny 1941-1945 gg.: sbornik statei*. (Moskva: Voen. izd-vo, 1956); David M. Glantz, *Forgotten Battles of the Soviet-German War (1941-1945)*, I to VIII vols, (Carlisle, PA: Self-published, 2006).

⁸ V.V. Gurkin and M.I. Golovnin, 'On the Questions of Strategic Operations in the Great Patriotic War,' *Military History Journal*, no. 10 (1985): 10-23 (English translation JPRS-Foreign Broadcast Information Service p.9-24); 'Results of the Discussion on the Operations of the Great Patriotic War 1941-45', *Military History Journal*, no. 7 (1986): 46-48 (JPRS translation); 'Results of the Discussion on the Operations of the Great Patriotic War 1941-45', *Military History Journal*, no. 5 (1986): 48-50 (JPRS translation); 'Results of the Discussion on the Operations of the Great Patriotic War 1941-45', *Military History Journal*, no. 4 (1986): 48-52 (JPRS translation); 'Results of the Discussion on the Operations of the Great Patriotic War 1941-45', *Military History Journal*, no. 10 (1987): 8-24 (JPRS translation).

Soviet casualties, in all their editions and other reference books.⁹ The data set suffered from a number of issues; firstly, Glantz had only produced six out of the eight planned volumes in his series, although much of the material for the missing volumes appeared in the second edition of *'When Titans Clashed'*.¹⁰ Secondly, Krivosheev referenced a number of operations which it was not possible to identify, and in some cases he grouped operations together, giving them new names, so these operations had to be excluded.

The biggest hurdle in using the canon of operations as a measure of the activity of the war, was that the operations varied in duration, in size and in scope, with large variations between the smallest and largest examples. Given these issues, there are undoubtedly mistakes and omissions in the list used for the article and it cannot be regarded as being entirely accurate. Yet it was sufficiently accurate to show some broad trends and to give a picture of the scale and activity of the war in a more comprehensive way than many modern accounts. A modern history written by a Western historian following this scheme would be highly desirable.

Looking at the publications that make up the thesis as a whole, the central idea of a system that linked the output of the economy to military activity was a bold one. It required that the armies at the bottom conduct their operations in a certain way and that the fronts supported this; it required that the Centre Bases of the *NKO* act as a distribution point for the system. The flow of supplies from the Centre to the front-line was directed to create a sequence of operations at the Front level, using the

⁹ G.F. Krivosheev, *Grif Skretnosti Sniat: Poteri Vooruzhennykh Sil Sssr v Voinakh, Boevykh Deistviyakh i Voennykh Konflikakh*, (Moskva: Voenizdat, 1993); G.F. Krivosheev, *Rossiia i SSSR v voynakh XX veka. Kniga poter'*, (Moskva: Veche, 2010).

¹⁰ David M. Glantz and Jonathan M. House, *When Titans Clashed: How the Red Army Stopped Hitler*, (Lawrence, KN: University Press of Kansas, 2015).

Centre Bases to control the sequence. At higher levels, the Staff of the Rear needed to control this flow through the bases-fronts-armies sequence and *Stavka* and the *GKO* had to issue the necessary orders to the Staff of the Rear. Finally, the national shortage of munitions, fuel and food shown in the work of Baylsh, Vernidub, Sudarikov and Kulishov needed to be seen in the operational supply documents and be reflected in the canon of operations.¹¹

The central argument of this thesis is supported by this chain of evidence. However, if any one of those links was shown to be untrue then the whole argument would collapse and what is left, is an interesting logistics system of a mixed horse-drawn and motor-vehicle equipped army and a national dependence on Lend-lease for the supply of munitions and other products. Yet, there is secondary evidence that this scheme was in existence. For example, Deputy Front Commander (Rear) Antipenko in March 1945 was facing his railway bridges over the Vistula being swept away by melting ice flows and said:

‘It was necessary to save the bridges, otherwise the entire front would have been **cut off for 10-15 days from the central supply bases**. The Military Council took into account the gravity of the situation.’

The situation was that 1st Belorussian Front was sitting on the river Oder and

¹¹ Vernidub, *Boepripasy Pobedy. Ocherki* (Moskva: TsNIINTIKPK (TSentr. nauchno-issl. in-t nauchno-tekhn. informatsii, kon”iunktury i povysheniia kvalifikatsii kadrov), 1998); Andrei Mikhaïlovich Sudarikov, ‘Prichiny nekhvatki artilleriiskikh boepripasov u Krasnoi armii v nachal’nyi period Velikoï Otechestvennoi voïny’, *Tsarskoye Selo Readings* III, no. XV (2011): 82–86; P.N. Kulishov, *Artilleriiskoe Snabzhenie V Velikoï Otechestvennoi Voïne 1941-45 gg. Kniga pervaya*, vol.1, 2 vols (Moskva - Tula: Glavnoe Raketno-Artilleriiskoe Upravlenie, 1977); P.N. Kulishov, *Artilleriiskoe Snabzhenie V Velikoï Otechestvennoi Voïne 1941-45 Gg. Kniga vtoraiâ*, vol.2, 2 vols (Moskva - Tula: Glavnoe Raketno-Artilleriiskoe Upravlenie, 1978).

Antipenko was worried about the bridges over the Vistula, 500 km away, as they connected with Centre Bases over 1,000 km away. Similarly, the *Berlin Strategic Offensive* was launched without the full allocation of munitions which were delivered during the course of the operation. The armies had arrived on the river Oder in February and the offensive was not launched until April, so there was plenty of time to re-supply them for the forthcoming battle. Yet the demands of other offensives on the flanks, such as the 2nd and 3rd Belorussian Front's *East Prussian Offensive* swallowed up the available supplies and munitions. This demonstrates both the 'just-in-time' nature of Red Army supply and the real shortages experienced even in 1945.

The impact of this thesis on the historiography of the German-Soviet War has the potential to be significant. It poses challenges to existing ideas about how the war is portrayed; about the role and significance of Lend-lease; the way in which the Soviet high command functioned; the way in which logistics was delivered and the nature of mobility in the Red Army. At the centre of the thesis is an idea. It's Vladimir Ilyich Lenin's idea about the definition of the word *Tyl*, an organisation that linked the Red Army with every aspect of the nation state, its economy, its agriculture and its people.¹²

Research in context

The significance of this thesis is that provides the first major re-examination of Red Army logistics in western scholarship, since partial studies were carried out immediately after the collapse of the Soviet Union. It builds on the work of James Schneider who put forward the idea that the Soviet Union was a 'warfare state' which

¹² Iu. Korablev, 'Deiatel'nost' V. I. Lenina po sozdaniiu tyla Krasnoï Armii (1918 god)', *Voenna-Istoricheskiĭ Zhurnal*, №12 (1967): 3–14.

created both a theory of total war, through the work of Frunze, Svechin, Triandafillov, Shaposhnikov and Isserson and provided the military infrastructure for it, through the re-ordering of agriculture and industry by the first three Five Year Plans.¹³ The economic element draws on the work of Mark Harrison, highlighting both Soviet success in mobilizing the economy to produce weapons, while at the same time revealing its weakness in modern industries such as chemicals industry, which were needed in this modern war.¹⁴ The work of Balysh adds to this theme by exposing the Soviet inability to manufacture sufficient propellant powder and high explosives to meet its wartime usage, with the shortage made good by Lend-lease imports.¹⁵

The work of the key researchers into the Red Army such as David Glantz and Alexander Hill provide a great deal of background material, for this thesis.¹⁶ Using these works as foundational texts and building upon them, while drawing in new sources looking at the Rear as a distinct subject. As regards, the integration of the Rear with the High Command, Erickson and Turbiville show that the pre-war organisation, which stressed General Staff direction of supplies through a subordinate quartermaster service and delivery by the Military Communications Service (VOSO) failed to work. Modern warfare was too complex for this *laissez-faire* approach, it

13 James J Schneider, *The Structure of Strategic Revolution.: Total War and the Roots of the Soviet Warfare State*. (Novato, CA: Presidio Press, 1994)

14 M. Harrison, *Accounting for War: Soviet Production, Employment, and the Defence Burden, 1940-1945* (Cambridge: Cambridge University Press, 1996).

15 A.N. Balysh, 'Proizvodstvo boepripasov v SSSR v 20-30-e gg. Khkh V. I boesposobnost' krasnoï armii nakanune i v gody Velikoï Otechestvennoï voïny', *Vestnik RUDN. Istoriiā Rossii* 2010, no. 4 (2010): 119–27.

16 David M. Glantz, *Colossus Reborn: The Red Army at War: 1941-1943* (Lawrence, KS: University Press of Kansas, 2005); Harrison, *Accounting for War*; Alexander Hill, *The Red Army and the Second World War* (Cambridge, United Kingdom: Cambridge University Press, 2017).

required a dedicated agency to work alongside the General Staff to control supplies and transport.¹⁷

Given the paucity of studies on the logistics of the Red Army in the English-language and the limited scope of the studies in the Russian-language, this thesis has a real opportunity to advance the knowledge both of general mechanisms of military logistics and the specific ones used by the Red Army. It has combined economic studies with previous work done on the Centre Bases of the NKO, to show how the Soviet Union strove to allocate its limited resources so that it could fight a large-scale, high-tempo war. It demonstrates the importance of the centralised and militarised railways in providing a direct link between the factories in the hinterland and the front-line and in providing operational level mobility to deliver series of operations. Finally, how the Soviet High Command managed its pattern of operations to account for the fact that the bulk of its army was horse-drawn combined-arms armies which could only carry out offensives over a limited distance and time. It grouped fronts into 'Strategic Directions' so that as one front's offensive faded, the baton was picked up by a neighbouring front to continue the offensive and fully motorised tank armies amplified the effect of these operations through deep exploitation.

The current historiography assigns a central role to Lend-lease deliveries in achieving the improvement in Red Army logistics and mobility seen from August 1943.¹⁸ This thesis takes a different viewpoint, showing that the evolution of the Rear

¹⁷ John Erickson, *The Soviet High Command: A Military-Political History, 1918-1941* (London; New York: Macmillan Press, 1962); Graham H. Turbiville Jr., 'Sustaining Theatre Level Strategic Operations', *Journal of Slavic Military Studies* 1, no. 1: 81–107.

¹⁸ Evan Mawdsley, *Thunder in the East: The Nazi-Soviet War, 1941-1945*, 2nd ed. (London: Bloomsbury, 2017).

from 1941, coupled with its integration with the overall Soviet method of warfighting were more significant. The achievement in managing the resource allocation of the Soviet Union's limited stocks was done by using railways and the mobility gained at front level was achieved by avoiding or overcoming their damage. Finally, the main weight of the operations was carried out by the 60 combined-arms armies with substantial horse-drawn transport and only limited numbers of motor vehicles, supported by railways. These conducted *expedition* style offensives and often relied on capturing enemy food and fuel depots and quickly restored railway lines to increase the depth of their offensives.¹⁹

¹⁹ In areas of poor food supply, when armies cannot feed themselves from the local resources, there are two methods that armies can use to support themselves away from strategic transport like railway lines or inland waterways. These are the terms *expedition* and *convoy* which define different methods of delivering supplies to an army and how far it can travel away from strategic transport routes and for how long.

In the case of an *expedition*, the army loads up all its transport at the start which marches alongside the troops as a mobile depot. While this enables armies to march long distances with great freedom, it is time limited as the army must re-connect with a railway or magazine before the supplies are all consumed.

By contrast, in a *convoy* system, the army is linked to a railhead or magazine by convoys of transport shuttling back and forth between the troops and the source of supply. This limits the range and freedom of operation of the troops but can be maintain almost indefinitely. Typically, troops could be supplied by *convoy* at 100 miles range from a railhead, while an *expedition* might cover up to 250 miles over the 14 days that its supplies lasted.

In areas of good food such as northern Europe or northern Italy, supply for the period between the French Revolutionary Wars and 1915, an army could march with freedom drawing on food from local agricultural networks so long as it kept moving.

From 1915, the demands for ammunition of modern warfare meant that armies were now reliant on strategic transport even when operating in areas of good food supply and armies had to rely on either the *expedition* or *convoy* methods to sustain themselves during operations.

see John G. Moore, 'Mobility and Strategy in the Civil War', *Military Affairs* 24, no. 2 (1960), pp.113.

Literature Review:

English language historiography

While the Red Army has been extensively researched over many decades in Western historiography, the English-language historiography on the subject of logistics of the Red Army is very limited, with very little written on the methodology used during the German-Soviet War 1941-1945. This stands in stark contrast to the extensive writings on German Army logistics during the 1941 campaign which has become something of a *cause célèbre* and is widely covered.²⁰

The historiography can be broken down into three broad periods with the initial period lasting between 1940s and the 1970s, when historians relied heavily on the opinions of German officers with experience of fighting the Soviets during the war. The framing of these studies was largely operational in outlook, reflecting the authors' military experience and was supported by the limited observations of some British and American officers from the end of the war.²¹ Studies on the Red Army by the US Army began with the *Foreign Military Studies* series of interrogations of German officers between 1945 and 1954 and while there are no studies on Soviet logistics, there are

²⁰ M. van Creveld, *Supplying War: Logistics from Wallenstein to Patton*, 2nd edition (Cambridge; New York: Cambridge University Press, 2004), chap. 5; David Stahel, *Operation Barbarossa and Germany's Defeat in the East* (Cambridge: Cambridge Univ. Press, 2012); Horst Boog et al., *Germany and the Second World War*, ed. Ewald Osers, trans. Dean S. McMurry and Louise Wilmott, vol. 4 & map booklet (Oxford: Clarendon Press, 1998).

²¹ R.L. Garthoff, *How Russia Makes War: Soviet Military Doctrine* (London: G. Allen & Unwin, 1954), 293–94. Giffard Le Quesne Martel, *The Russian Outlook* (London: Michael Joseph, 1947). 103-7

major studies on German transport and supply, often referencing Soviet efforts and no less than five studies on Soviet supply of partisans.²²

The period between the late 1970s and the end of the Cold War saw major challenges to contemporary thinking with a wider framing of historical debate into other fields such as society, the economy and structural issues that influenced the war.²³ Yet the obstacles to research remained the same, with limited access to sources from both sides of the war. Martin van Creveld, Larry Addington and Walter Dunn all made contributions to understanding the role of logistics in the war, although Dunn's study of the Red Army relied too heavily on German intelligence reports which proved to be unreliable.²⁴ German transport capabilities were reassessed by DiNardo in 1988 which revealed the bulk of the German Army to be horse-drawn and it is noteworthy that no book has appeared on the Red Army despite both armies being broadly similar in their transport arrangements.²⁵

The period of *Perestroika* from 1985 to 2015 saw an opening up of the Soviet archives that expanded the field of inquiry still further. This brought to the fore a second historiographic thread that arose from the writings of Russian-speaking Anglo-American scholars back in the 1960s, such as the wartime journalist, Alexander Werth

²² Alfred Toppe, *T-8 Problems of Supply in Far Reaching Operations*, 28 vols, Foreign Military Studies Branch, (Carlisle Barracks, PA: Dept. of the Army, Office of Military History, 1951); D. Karov and V. Volzhanin, *P-125 Supply of Partisan Units During the War 1941-45*, Foreign Military Studies Branch, (Carlisle Barracks, PA: Dept. of the Army, Office of Military History, 1952) for example.

²³ John Barber and Mark Harrison, *The Soviet Home Front, 1941-1945: A Social and Economic History of the USSR in World War II* (New York: Longman, 1991).

²⁴ Martin van Creveld, *Supplying War: Logistics from Wallenstein to Patton* (Cambridge; New York: Cambridge University Press, 1977); Larry H Addington, *The Blitzkrieg Era and the German General Staff, 1865-1941* (New Brunswick, N.J.: Rutgers University Press, 1971); Walter Scott Dunn, *The Soviet Economy and the Red Army, 1930-1945* (Westport, CT: Greenwood Publishing Group, 1995).

²⁵ R. L. DiNardo, *Mechanized Juggernaut or Military Anachronism? Horses and the German Army of World War II* (Mechanicsburg, PA: Stackpole Books, 2008).

and his pupil, John Erickson.²⁶ Their work was continued from 1972 by the Soviet Studies Research Centre which used open-source and intelligence materials to study the contemporary Soviet armed forces and some of these studies related back to wartime logistics.²⁷ In turn, this effort inspired the creation of the US Army Soviet Army Studies Office in 1986 whose researchers produced major works up to its closure in 1991 and then continued publishing publicly up to the present day.²⁸ These highly influential groups provided the foundations for modern scholarship on the Red Army and on its logistics.²⁹

A third historiographic thread followed Soviet railways, including their management and usage in the service of both the Red Army and the wartime economy. Soviet railways during the 1930s were held up to the world as an example of the success of socialism, illustrated by several pre-war publications.³⁰ The economist, Holland Hunter, studied the Soviet transport system from 1949, as did fellow economist J.N. Westwood, the historian A.E. Rees and former military officer P. Garbutt, who between them produced a comprehensive history of the late Imperial

²⁶ Alexander Werth, *Russia at War, 1941-1945*, First Printing edition (London: Barries & Rockcliff (Barrie Books Ltd), 1964); John Erickson, *The Road to Stalingrad* (London: Weidenfeld and Nicolson, 1973).

²⁷ Turbiville Jr., 'Sustaining Theatre Level Strategic Operations' Christopher Duffy, *Red Storm on the Reich: The Soviet March on Germany, 1945* (London: Routledge, 1991); Charles J. Dick, *From Defeat to Victory: The Eastern Front, Summer 1944 Decisive and Indecisive Military Operations, Volume 2* (Lawrence: University Press of Kansas, 2016).

²⁸ James J Schneider, *The Structure of Strategic Revolution.: Total War and the Roots of the Soviet Warfare State*; David M. Glantz, *Colossus Reborn: The Red Army at War: 1941-1943*.

²⁹ Alexander Hill, *The Red Army and the Second World War*.

³⁰ K. N Tverskoi, *The Unified Transport System of the U.S.S.R.* (London: V. Gollancz, 1935); 'Soviet Railways', *USSR in Construction* – (English Language Edition), July 1938, University of Saskatchewan, <http://cdm15126.contentdm.oclc.org/cdm/landingpage/collection/p15126coll10>.

Russian and Soviet railways.³¹ Yet, there was little attempt by Western scholarship to link this history of transport with the activities of military logistics nor with German accounts of their railways in the occupied Soviet Union.

Russian language historiography

Soviet and modern Russian historiography on the 'Rear', was far more extensive than in the west. It had a broader framing including economics and society right from the start, however its analysis was largely limited to a narrative description of the achievements of the Soviet armed forces and Communist Party.³² The exception to this is the research carried out by the General Staff and Soviet military scholars who continued to have greater latitude in secret and closed forums such as the journals *Voenno-Istoricheskiĭ Zhurnal* and *Voennaia Mysl'*.³³

The historiography can be divided into six time periods beginning with the Stalin phase from 1945 until Khrushchev's secret speech to the XX Party Congress in 1956.³⁴ This period was characterised by hagiography and limited publication of

³¹ H. Hunter, *Statistics of Transportation in the U.S.S.R.* (Washington DC, Council for Economic and Industry Research, Incorporated, 1955); H. Hunter, *Soviet Transportation Policy* (Cambridge, MA: Harvard University Press, 1957); P.E. Garbutt, *The Russian Railways*. (London: S. Low, Marston, 1949); J. N. Westwood, *A History of Russian Railways* (London: G. Allen and Unwin, 1964); E.A. Rees, *Stalinism and Soviet Rail Transport* (Basingstoke: Palgrave MacMillan, 1994).

³² P. N. Pospelov and Institut istorii SSSR (Akademiia nauk SSSR), *Sovetskiiĭ tyl v Velikoĭ Otechestvennoĭ voĭne: Obshchiye problemy*, vol. I (Moskva: Mysl', 1974); P.N. Pospelov and Institut istorii SSSR (Akademiya nauk CCCP), *Sovetskiiĭ tyl v Velikoĭ Otechestvennoĭ voĭne.: Trudovoy podvig naroda*, vol. II (Moskva: Mysl', 1974).

³³ R.D. Markwick, *Rewriting History in Soviet Russia: The Politics of Revisionist Historiography, 1956-1974* (Basingstoke: Palgrave, 2001), 209–10.

³⁴ E.E. Stepanova, 'Tyl Sovetskikh Vooruzhennykh Sil (1918-1991 Gg.): Istoriofafiia Problemy' (Moskva, Federal'noe Biudzhethnoe Gosudarstvennoe Voennoe Obrazovatel'noe Uchrezhdenie Vysshego Professional'nogo Obrazovaniia «Voennyĭ Universitet», 2012); E.E. Stepanova, 'Ėvoliutsiia istorii i istoriografii Tyla Sovetskikh Vooruzhennykh sil', *Vlast*, no. 8 (21 September 2015): 177–81.

materials. Nonetheless the *Military-History Department* of the General Staff continued writing its wartime *Experience of War* series with the specific intent of disseminating 'best practice' around the Red Army. The series started in 1942, was extended to the Rear in January 1944 and then continued after the war until 1960 and included the 'Collection of Materials for the Study of War' (26 volumes 1942-1948); 'Collection of Military-Historical Materials' (19 volumes 1949-1960); 'Collection of combat documents' (43 volumes 1949-1960) and the 'Rear of the Red Army in the Great Patriotic War. Collection of materials.' (5 volumes 1944-1945).³⁵ Written without political bias, these remain some of the most insightful sources on Red Army operations.

The following period was a period of relative freedom during which the *Institute for Marxism-Leninism* was thrown into confusion following the events of 1956 and historians were able to take a more revisionist approach until a greater degree of control were re-established following the *Nekrich Affair of 1965*.³⁶ The first of four official histories was published in 1960 as was the General Staff's own top-secret account of the war.³⁷ Several major logistical studies appeared during these years, including Chief of the Rear, General A.V. Khrulev's seminal essay in 1961 and Deputy Chief of the Rear M.P. Milovsky's 6 volume work on wartime logistics in 1968.³⁸

³⁵ Ot Voenno-Istoricheskogo Upravleniia General'nogo Shtaba VC, 'Sbornik materialov po izucheniiu opyta voïny № 1 - 26', 1943; — 'Sbornik voenno-istoricheskikh materialov Velikoï Otechestvennoï voïny', 1949–1960; — 'Sbornik boevykh dokumentov Velikoï Otechestvennoï voïny', 1949–1960; Shtab Nachal'nika Tyla Krasnoï Armii - Otdel Boevoï Podgotovki, 'Tyl Krasnoï Armii v Otechestvennoï Voine. Sbornik Materialov. № 1-5'.

³⁶ Roger D. Markwick, *Rewriting History in Soviet Russia: The Politics of Revisionist Historiography, 1956-1974* (Basingstoke: Palgrave, 2001) pp.209.

³⁷ Petr Nikolayevich Pospelov et al., eds., *Istroriya Velikoï Otechstvennoï voiny Sovetskogo Soyuza 1941-1945. Tom. 6* (Moskva: Voenizdat, 1960); Voenno-istoricheskii otdel General'nogo Shtaba, *Strategicheskii Oчерk Velikoï Otechestvennoï 1941-1945 gg.* (Moskva: Voenizdat, 1961).

³⁸ A.V. Khrulev, 'Stanovlenie Strategicheskogo Tyla v Velikoï Otechestvennoï Voïne', *Voenno-Istoricheskii Zhurnal*, no. 06 (1961): 64–80.

The third period appeared slowly during the later years of the 1960s and continued up to the start of *Perestroika* in 1985. The period was one of retrenchment and orthodoxy, as the *Institute of Marxism-Leninism* re-established authority over the historical narrative; a second official history was published to reinforce the point in 1973.³⁹ However, it was during this time that general's memoirs started being published and these major figures began to dominate the military history narrative for both this period and subsequent ones.⁴⁰ They were joined by unit memoirs and those of field officers covering a wide range of topics across the supply and transport; often written by serving officers at Front and Army level, they provide examples of working practices in the 'operational army'.⁴¹ Notable accounts were given by N.A. Antipenko and I.V. Safranov, both Deputy Front Commander (Rear) by the end of the war, who contributed a whole series of books and journal articles on their experiences.⁴² These were joined by no less than two new major studies of the

³⁹ A. A. Grechko, G.A. Arbatov, and V.A. Vinogradov, *Istoriia Vtoroi Mirovoi Voyny 1939-1945* [History of the Second World War 1939-1945], 12 vols (Moskva: Voenizdat, 1973–1976).

⁴⁰ G.K. Zhukov, *Vospominaniia i Razmyshleniia: v triioj tomaj*, 1st ed., 1 vols (Moskva: Novosti, 1969).

⁴¹ Terekhin and Taralov, *Gvardejsy zheleznodorozhniki boevoi put' 1-oï Gvardeiskoi Zheleznodorozhnoi Varshavskoi ordena Kutuzova brigady, 1941-1945 gg.* (Moskva: Voenizdat, 1966); Kondratev et al., *Dorogi voïny*; S. V. Khvoshchev and A. V. Dobryakov, eds., *Ukhodili Na Front Èshelony* (Moskva: Voennoe Izdatel'stvo Ministerstva Oboroni USSR, 1974); I.V. Safranov, *Za frontom--tozhe front* (Moskva: Voenizdat, 1986).

⁴² N.A. Antipenko, *Na Glavnom Napravlenii* (Moskva: Nauka, 1967); N.A. Antipenko, 'Voprosy Tylovoï Obespecheniia Belorusskoi Operatsii', *Voenno-Istoricheskii Zhurnal* 1964, no. 6 (1964); N.A. Antipenko, 'Reshenie nekotorykh problem operativnogo tyla v khode Velikoi Otechestvennoi voïny', *Voenno-Istoricheskii Zhurnal* 1968, no. 5 (1968); N.A. Antipenko, 'In the Battle of Kursk', *Rear and Supply of Soviet Armed Forces*, no. 3 (1970): 51–59; N.A. Antipenko, 'Vtoroi Èshelon Glavnogo Napravleniia', *Tyl i Snabzhenie Sovetskikh Vooruzhennykh sil*, no. 5 (1977); I.V. Safranov, 'Rear Services of 2 Belorussian Front in East Prussian Operation', *Rear and Supply of the Soviet Armed Forces*, no. 01 (1970): pp.66-74; I.V. Safranov, 'Velikaia pobeda pod Kurskom', *Tyl i Snabzhenie Sovetskikh Vooruzhennykh sil*, no. 6 (1973): 36–41; I.V. Safranov, 'The Front Rear in the Belorussian Operation', *Rear and supply of Soviet armed forces*, no. 6 (1979):

Rear, a two volume study of logistics and home front was authored in 1974 by P.N. Pospelov and a single volume military study by S.K. Kurkotin which remains a major source into the present-day.⁴³

A significant series of articles was written by Colonel S.N. Skryabin in *Voenno-Istoricheskii Zhurnal* 1979 - 1986, which presented a critique to the current orthodox viewpoint regarding the foundation the Rear in August 1941 and highlighted the importance of the Centre Bases of the NKO.⁴⁴ Some of Skryabin's comments were so controversial, that they were directly contradicted by the Chief of the Rear Staff, General I.M. Golushko; specifically his claim that the former 'technical specialist' K.E. Goretsky, played an instrumental role in the foundation of the Rear in 1941.⁴⁵ Yet Skryabin's credibility was restored when this researcher found corroboration of his story in A.V. Khrulev's unpublished draft memoirs, confirming the pivotal role played by Goretsky.⁴⁶

The mid-1980s saw the introduction of a more liberal regime under *Perestroika* which led to military historians to re-examining previous assumptions. This fourth period saw focus shift to producing more detailed studies; with a debate in *Voenno-*

33–36; I.V. Safronov, 'The Front Rear in the Belorussian Operation', *Rear and supply of Soviet armed forces*, no. 1 (1980): 59–64.

⁴³ Petr Nikolayevich Pospelov and Institut istorii SSSR (Akademiia nauk SSSR), *Sovetskii tyl v Velikoï Otechestvennoï voïne: Obshchiye problemy*; Petr Nikolayevich Pospelov and Institut istorii SSSR (Akademiya nauk CCCP), *Sovetskii tyl v Velikoï Otechestvennoï voïne:: Trudovoy podvig naroda* (Mysl', 1974); S.K. Kurkotin, *Tyl Sovetskikh Vooruzhennykh Sil V Velikoi Otechestvennoi Voine* (Moskva: Voenizdat, 1977).

⁴⁴ S.N. Skryabin, 'Iz Istorii Sozdaniia Organov Upravleniia Tylom Sovetskoï Armii', *Voenno-Istoricheskii Zhurnal*, no. 7 (1979): 54–59; S.N. Skryabin, 'Sozdanie baz snabzheniia Tsentra', *Voenno-Istoricheskii Zhurnal*, no. 10 (1986): 54–60.

⁴⁵ I. M Golushko, *Shtab Tyla Krasnoï Armii v gody voïny 1941-1945*, (Moskva: Èkonomika i informatika, 1998), 26.

⁴⁶ 'Narkom Khrulev: Toporov Andreï Viktorovich, General-Leitenant,' *Velikiy Intendant: Andrey Vasil'yevich Khrulev 30.09.1892-09.06.1962* (blog), 2017, <https://general-khrulev.com/>.

Istoricheskiĭ Zhurnal around expanding the canon of operations, a major two volume work by V.T. Ankisov giving greater detail of operations than before and another major study on the link between railways and military operations written by G. Kumanev in 1988.⁴⁷

The collapse of the Soviet Union marks the start of the fifth period which continued up until 2014 and was followed by the current period of retrenchment and the turn to a nationalist framing of the present day. Collections of published archival documents appeared in *Russian Archive – Great Patriotic War* under the editorship of Zolotarev between 1993 and 2001 with volume 25 on the Rear and other useful volumes on the General Staff volume 23, *Stavka* volume 16, and People's Commissariat for Defence volume 13.⁴⁸ Online collections added further documents from the *Presidential Library*; *Archives of Russia* for Stalin's personal papers (Fond 588), GKO and NKO resolutions; the *Electronic Library of Historic Documents*; *Militeria*, for online collections of Soviet-era books and the *Pamyat Naroda* website provided over six million primary source documents from the Central Archive of the Ministry of Defence Russian Federation by 2023.⁴⁹ Researchers from the former Soviet states used this plethora of sources to

⁴⁷ Viktor Tikhonovich Aniskov, *Sovetskiy tyl v pervyy period Velikoy Otechestvennoy voyny*, ed. G.A. Kumanev, vol. 1, 2 vols (Nauka, 1988); Viktor Tikhonovich Aniskov, *Sovetskiy tyl v period korennoĭ pereloma v Velikoy Otechestvennoy voyne, noyabr' 1942-1943*, ed. Avgusta Vasil'yevna Mitrofanova, vol. 2, 2 vols (Nauka, 1989); G.A. Kumanev and Yu.A. Polyakov, *Voĭna i zheleznodorozhnyi transport SSSR, 1941-1945*, (Nauka, 1988).

⁴⁸ V. A. Zolotarev et al., *Russkiĭ arkhiv: Velikaia Otechestvennaia* (Moskva: Teppa, 1993–2012); V. A. Zolotarev et al., *Tyl Krasnoj Armii v Velikoj Otechestvennoy vojny 1941-1945 gg.*, Tom. 25 (14), 25 tom, Russkij Archiv. Velikaja Otechestvennaja (Moskva: Terra, 1998); V.I. Isakov, ed., *Tyl Vooruzhennykh Sil v dokumentakh*, (Moskva: Voentekhlit, 2000).

⁴⁹ 'Pamyat Naroda: Documenti chastei', Pamyat Naroda, accessed 22 July 2025, <https://pamyat-naroda.ru/documents/>, 'RGASPI Fund 558. Stalin (Dzhugashvili) Iosif Vissarionovich (1878 – 1953)', accessed 23 March 2021, <http://sovdoc.rusarchives.ru/sections/personality/>.

write more detailed examinations of famous operations, working methods of the Rear or to bring to life the experience of ordinary soldiers.⁵⁰

The operation of railways and other means of transport was covered as a separate historiographic thread and was one subject area where the Soviet Union was more open. The achievement of Soviet railways demonstrated to the world the superiority of socialism with articles appearing from the 1930s, across several languages and in both public and technical publications.⁵¹ This trend continued post-war with a steady stream of publications from specialist historians and veterans which stuck closely to an uncontroversial Party line throughout the Soviet period, with examples being Georgi Kumanev's study on railways in wartime, I.V. Kovalev's history of transport, his work on railway workers and N.S. Konarev's pamphlet on railways in the decisive operations.⁵²

German language historiography

The German language historiography lacks a tradition of the study of logistics in large part because since the seventeenth century, Prussia/Germany fought all of their wars

⁵⁰ A.I. Mirenikov, *Voyenno-ekonomicheskii faktor v Stalingradskom srazhenii i Kurskoy bitve* (Moskva: RITs MO RF, 2005); P.F. Gladkikh, *Meditsinskaiia sluzhba Krasnoi Armii v Velikoï Otechestvennoi voine 1941-1945 gody*, (Sankt-Peterburg: Petropolis, 2013).

⁵¹ K. N Tverskoi, *The Unified Transport System of the U.S.S.R.*; 'Soviet Railways', *USSR in Construction – (English Language Edition)*, July 1938; Narodnyi komissariat putei soobshcheniia, *Zheleznodorozhnyi transport Zhurnal* (Moskva: Transzheldorizdat, 1941).

⁵² GA Kumanev, *Na sluzhbe fronta i tyła: zheleznodorozhnyi transport SSSR nakanune i v gody Velikoï Otechestvennoi voiny, 1938-1945* (Moskva: Nauka, 1976); I.V. Kovalev, *Transport v Velikoï Otechestvennoi voine, 1941-1945 rr.*, (Moscow: Nauka, 1981); N. S. Konarev, *Zheleznodorozhniki v Velikoï Otechestvennoi voine 1941–1945*, (Moscow: Transport, 1985); I. V. Kovalev, *Transport v reshatishchikh operatsiakh Velikoï Otechestvennoi voiny*, (Moscow: Nauka, 1969).

close to their own borders. The German-Soviet War represented a rare occasion when Germany conducted a 'far distant' operation and even here, logistics occupied a marginal position within an overly operational narrative. As a result, the historiography has evolved through three main periods and covered two main themes.

The period from 1945 to the 1970s was dominated by wartime German officers accounts, with a huge range of reports written for the US Army edited by former Chief of the General Staff, Franz Halder. For example, *T-8 Problems of Supply in Far Reaching Operations* by Alfred Toppe remains a core text on German army logistics during the campaign.⁵³ However there are no direct studies on Soviet logistics and officers such as *Gruppenführer* Max Simon depicted Soviet methods as primitive or unnecessary given the sub-human nature of Red Army soldiers; living off a crust of bread in their greatcoat pocket, feeding their horses from the thatch of cottages or relying on American-made lorries. These attitudes were reinforced by generals' memoirs published in the post-war period and popular histories written for instance, by Ribbentrop's press secretary, using the pseudonym 'Paul Carell'.⁵⁴ Lower ranking soldiers memoirs spawned a genre of '*landser literature*' featuring adventure stories, uncritical nationalism and contempt for an inferior Red Army.

The period from the late 1970s through to 1995 represents a major historiographical shift as West German historians increasingly challenged the

⁵³ Max Simon, *P-077 Soviet Russian Infantry and Armored Forces*, Foreign Military Studies Branch, P-077 (Carlisle Barracks, PA: Dept. of the Army, Office of Military History, 1947); Max Bork, *T-7 Comments on Russian Railroads and Highways*, Foreign Military Studies Branch, T-7 (Carlisle Barracks, PA: Dept. of the Army, Office of Military History, 1953); Toppe, *T-8 Problems of Supply in Far Reaching Operations*.

⁵⁴ Erich von Manstein, *Verlorene Siege* (Bonn: Athenäum Verlag, 1955); Paul Carell, *Unternehmen Barbarossa: Der Marsch Nach Rußland* (Berlin: Ullstein, 1963); Paul Carell, *Verbrannte Erde : Schlacht Zwischen Wolga Und Weichsel* (Berlin: Ullstein, 1963).

operational framing and widened it into an approach encompassing ideology, economics, society and structural issues.⁵⁵ This process was aided by the initial publication of the series of official histories, *Das Deutsche Reich und der Zweite Weltkrieg*, in 1979, which reflected this new approach and publication continues up to the present day.⁵⁶ Although not directly addressed, the subject of Soviet logistics was covered tangentially by many of these studies and by the widening scope of research particularly into railway operations.⁵⁷ Major studies were conducted into the operation of railways in the German occupied part of the Soviet Union, based on earlier publications by former railway officials such as Eugen Kreidler, using personal collections of official papers saved at the end of the war.⁵⁸

The end of the Cold War in 1995 saw the opening of the Soviet archives and release of captured German documents held by the Soviet Union⁵⁹ and this was coupled with the demise of the 'Myth of the clean Wehrmacht'. The subsequent reassessment of German history continues to this day continuing the work begun by Christian Streit in 1980, with further publication of volumes of the official history, *Band*

⁵⁵ Rolf-Dieter Müller and Gerd R. Ueberschär, *Hitlers Krieg Im Osten 1941-1945: Ein Forschungsbericht* (Darmstadt: Wissenschaftliche Buchgesellschaft, 1994).

⁵⁶ Karl-Heinz Frieser, Manfred Messerschmidt, and Rolf-Dieter Müller, eds., *Das Deutsche Reich und der Zweite Weltkrieg. Band 1-10*, 10 vols in 13 books vols, Beiträge zur Militär- und Kriegsgeschichte (Deutsche Verlags-Anstalt, 1979–2008).

⁵⁷ Klaus A. Friedrich Schüler, *Logistik im Russlandfeldzug: die Rolle der Eisenbahn bei Planung, Vorbereitung und Durchführung des deutschen Angriffs auf die Sowjetunion bis zur Krise vor Moskau im Winter 1941/42*, (Frankfurt am Main; P. Lang, 1987).

⁵⁸ Eugen Kreidler, *Die Eisenbahnen Im Machtbereich Der Achsenmächte Während Des Zweiten Weltkrieges. Einsatz Und Leistung Für Die Wehrmacht Und Kriegswirtschaft*. (Berlin; Musterschmidt, 1974), Hans Pottgiesser, *Die Reichsbahn im Ostfeldzug 1939-1944. Die Wehrmacht im Kampf*, Band 26 (Vowinkel Verlag, 1961).

⁵⁹ 'Akte 29. Unterlagen Des Chefs Transportwesen Im OKH: Geschäftsverteilungsplan Des Chefs Transportwesen Im OKH – Stand 27.12.1942.', *Russisch-deutsches Projekt zur Digitalisierung deutscher Dokumente in den Archiven der Russischen Föderation*, <https://wwii.germandocsinrussia.org/de/nodes/14455-akte-29-unterlagen-des-chefs-transportwesen-im-okh-gesch-fitsverteilungsplan-des-chefs-transportwesen-im-okh-stand-27-12-1942>.

VIII coming out in 2007 covering the final two years of the war against the Soviet Union. In addition, there have been new studies on the operation of German railways in the East written by Alfred Gottwald.⁶⁰ However there have been no direct studies of Soviet logistics and it continues to be included within wider studies of the Red Army or as a comparison within German Army studies.

Lend-lease historiography

From the very earliest days of Lend-lease, American authors saw the transfer of weapons and materials as a significant or even decisive factor in winning the war and also as a financial transaction.⁶¹ Some later historians argued that the transfer even helped the Soviet Union during the Cold War.⁶² The wartime Soviet government response was to thank the United States for its aid but to point out that it represented only 4% of the economic output of the Soviet Union during the war.⁶³ The Khrushchev period saw a softening of the tone especially in the official history of 1965, however the tone hardened again in later official histories right up to the present day.⁶⁴ Despite

⁶⁰ Alfred Gottwaldt, *Eisenbahner gegen Hitler: Widerstand und Verfolgung bei der Reichsbahn 1933-1945*, 1., Neuerscheinung (Wiesbaden: Marixverlag, 2009); Karl-Heinz Frieser, *Das Deutsche Reich und der Zweite Weltkrieg. Band 8: Die Ostfront 1943/44: der Krieg im Osten und an den Nebenfronten*, vol. 8 (Berlin: Deutsche Verlags-Anstalt, 2007).

⁶¹ John R. Deane, *The Strange Alliance* (London: The Viking Press, 1947); Eugene Staley, 'The Economic Implications of Lend-Lease', *The American Economic Review* 33, no. 1 (1943): 362–76; Edward R. Stettinius, *Lend-Lease* (Penguin Books, 1944);.

⁶² George C. Herring, 'Lend-Lease to Russia and the Origins of the Cold War, 1944-1945', *The Journal of American History* 56, no. 1 (1969): 93–114; Sean McMeekin, *Stalin's War: A New History of World War II* (NY; New York: Basic Books, 2020).

⁶³ N. A. Voznesenskiĭ, *The Economy of the USSR during World War II*, Current Soviet Thought Series (Washington: Public Affairs Press, 1948).

⁶⁴ Alexander Hill, *The Great Patriotic War of the Soviet Union, 1941-45: A Documentary History* (London: Routledge, 2009) pp.163-165; A.Ė. Serdiukov and V.A. Zolotarev, *Velikaia Otechestvennaia voĭna 1941-1945 godov : v dvenadtsati tomakh*, (Moskva: Voennoe Izd-vo, 2015), vol. 7 p.555, <http://encyclopedia.mil.ru/encyclopedia/books/vov.htm>.

this official viewpoint, Kucherenko argues that a ‘motley group’ of post-Soviet ‘revisionist historians’ offered a more international view of Lend-lease, which ranged from N.V. Butenina’s view that it was ‘significant yet not decisive’ through to Boris Sokolov who argued that Lend-lease was ‘vital to winning the war’.⁶⁵ Others such as V.F. Vorsin, writing on motor vehicles, have made the Soviet case in more detail and exposed the variance in statistics between the US ones of what was dispatched and the Soviet ones of what was finally delivered after Axis depravations and British diversions.⁶⁶

A second line of argument in support of Lend-lease was started by General John Deane, who argued that while Lend-lease might not be large in scale, the delivery of advanced technological items such as radios, motor vehicles and aircraft magnified their effect and made their delivery decisive.⁶⁷ This was a ‘technologically determinist’ argument, with all the associated weaknesses and while it has been broadly accepted, in reality there has been very little analysis of the underlying causes and effects. An exception to this is Alexander Hill, who has shown that British Lend-lease tanks, did play an important role during the Battle of Moscow, their effect belying their limited numbers.⁶⁸ However, the logical conclusion to this argument was demonstrated by Phillips O’Brien who argued that the decisive arena of the Second World War was the

⁶⁵ Olga Kucherenko, ‘Lend-Lease in War and Russian Memory’, in *The Memory of the Second World War in Soviet and Post-Soviet Russia*, ed. David Hoffman (Oxford: Routledge, 2021), N.V. Butenina, *Lend-liz: sdelka veka* (Moskva: Gos. un-t Vyssh. shk. ekonomiki, 2004), chp: Vvedenie; Boris V. Sokolov, ‘The Role of Lend-Lease in Soviet Military Efforts, 1941–1945’, *The Journal of Slavic Military Studies* 7, no. 3 (1994): 567–86.

⁶⁶ V. F. Vorsin, ‘Motor Vehicle Transport Deliveries Through “Lend-Lease”’, *The Journal of Slavic Military Studies* 10, no. 2 (1 June 1997): 153–75.

⁶⁷ John R. Deane, *The Strange Alliance* (London: The Viking Press, 1947).

⁶⁸ Alexander Hill, ‘British Lend-Lease Tanks and the Battle of Moscow, November–December 1941 — Revisited’, *The Journal of Slavic Military Studies* 22, no. 4 (30 November 2009): 574–87.

air-sea battlefield, as this destroyed the greatest amount of output of the Axis powers economies.⁶⁹ It was countered by Mark Harrison who showed that human beings do count in the balance and are irreplaceable compared to machines.⁷⁰

Starting in the 1980s economists such as Mark Harrison, Stephen Wheatcroft and R.W. Davies promoted the view that Lend-lease had contributed around 10-15% towards the Soviet military economy, but that this paled into significance against the loss of 40% of the economy following the German invasion.⁷¹ They argued that it was the ability of the Soviet state to mobilise what was left and create a second industrial base in the Urals and another agricultural base in the Volga and Kazakhstan regions that was the deciding factor. Lend-lease contributed by making the war less costly for the Soviet state and in saving the lives of millions of citizens who might have died fighting or starved to death. The timing of Lend-lease deliveries after mid-1943 showed that the Soviet Union had already turned the corner in the military campaign and that the question was now how long it would take to expel the invaders from Soviet soil, rather than 'if' they could be defeated.⁷² This is the view used in this thesis.

⁶⁹ Phillips Payson O'Brien, *How the War Was Won: Air-Sea Power and Allied Victory in World War II*, (Cambridge: Cambridge University Press, 2015).

⁷⁰ Mark Harrison, 'World War II: Won by American Planes and Ships, or by the Poor Bloody Russian Infantry?', *Journal of Strategic Studies* 39, no. 4 (2016): 592–98.

⁷¹ R. W. Davies, Mark Harrison, and S. G. Wheatcroft, eds., *The Economic Transformation of the Soviet Union, 1913-1945*, (Cambridge: Cambridge University Press, 1993); Mark Harrison, *Accounting for War: Soviet Production, Employment, and the Defence Burden, 1940-1945*.

⁷² David M. Glantz and Jonathan M. House, *When Titans Clashed: How the Red Army Stopped Hitler*, Revised edition (Lawrence, KN: University Press of Kansas, 2015).

Critical analysis

Logistics in perspective

Central to the study of logistics is the role of strategic transport; methods able to carry tremendous loads at speed over long distances. For most of the nineteenth century and twentieth centuries, this meant shipping for maritime powers, such as the British Empire or railways for continental powers such as Imperial Germany and Tsarist Russia. In many ways, railways created modern warfare; making mass mobilisation of populations possible and in facilitating the rapid movement of mass armies to the frontier, complete with all their equipment and supplies for the forthcoming campaign.⁷³

Yet European countries had little need of railways after deployment to move supplies, equipment and replacements at the operational level, because their wars were of short duration and were fought in areas of high population density with ample food resources. Their armies could draw on local supply for food, while ammunition consumption was limited, so there was little incentive for military commands to integrate with railway authorities, with the result that railway efficiency was low.⁷⁴ Besides which, it was believed that railways offered an advantage to the defender who could block lines with fortresses or by destroying bridges and tunnels.⁷⁵

This was not a universal experience, as the British discovered during the Second Boer War, because some wars were of longer duration or in areas of low food

⁷³ Massimiliano Gaetano Onorato, Kenneth Scheve, and David Stasavage, 'Technology and the Era of the Mass Army', *The Journal of Economic History* 74, no. 2 (June 2014): 449–81.

⁷⁴ Martin van Creveld, *Supplying War: Logistics from Wallenstein to Patton*, 2nd edition (Cambridge: Cambridge University Press, 2004), chap. 3.

⁷⁵ Edwin A Pratt, *The Rise of Rail-Power in War and Conquest, 1833-1914*, (London: P.S. King & Son, 1916), chap. III.

supply and it's here that railways became a vital tool of operational level warfare in delivering *convoy* supply. Countries such as Imperial Russia and the United States, had low population densities, and hence insufficient food supply in the local area for armies to use to support themselves. Food and fodder for the horses had to be imported from afar. The American Civil War which started in 1861 had been the first true railway war, with supplies and replacements delivered by train to armies in the field and even used at the tactical level for the delivery of reinforcements and ammunition during the *Second Battle of Bull Run*. These campaigns became defined by the direction of railway lines, the holding of railway junctions and rates of railway destruction and repair.

The management of military operations depended on sophisticated integration between military and railway authorities to achieve the greatest efficiency, which was demonstrated by the reform of the Union railways by Herman Haupt.⁷⁶ Haupt's 'rules' for running railways for military operations are as relevant today as in 1862 when he created them. Despite American railways lacking a complete network, being of low technical standard and largely single-tracked, they were able to support large armies across great distances. Another feature of the war was that it was fought across two different gauges, (the Confederate states 5' gauge and the Union states 4'8" series of gauges,) with so few problems that it is rarely mentioned by historians of the conflict.⁷⁷ In addition, the Civil War saw several different methods of obtaining high mobility by

⁷⁶ Christian Wolmar, *Engines of War: How Wars Were Won and Lost on the Railways* (London: Atlantic Books, 2012), 42-44; Edward Hagerman, *The American Civil War and the Origins of Modern Warfare: Ideas, Organization, and Field Command* (Bloomington, IN: Indiana University Press, 1988).

⁷⁷ Douglas J. Puffert, 'The Standardization of Track Gauge on North American Railways, 1830-1890', *The Journal of Economic History* 60, no. 4 (2000): 933-60.

armies in regions of wilderness or low population density, such as the 'French method' pioneered by Quartermaster General Meigs in the *Army of the Potomac* or the use of *expeditions* during General Grants *Vicksburg Campaign* or the tailoring of military forces to local food supplies as seen in General Sherman's *March to the Sea*.

For the Russian Empire, lying on the periphery of Europe with poor communications, low population density and uneven distribution of food supply, railways were widely used at all levels of military operations in the same way as in the American Civil War using *convoys* and not in the typical European manner. In both the Russo-Turkish War 1877 and the Russo-Japanese War of 1905 railways were used for mobilisation, deployment and supply; being crucial to the outcome of the war.⁷⁸ In Rumania in 1877, Russian railway battalions and a contractor called Polyakov, built a new high-quality 229-mile railway in just 58-days to link the Russian *South-Western Railway* with the Bulgarian network to supply the troops.⁷⁹ They followed this by building a second 40-mile line and had even started on a third line by the war's end.

Russian railways encountered problems, such as the trans-shipment point at Galatz which proved to be a bottleneck in 1877 and Lake Baikal on the *Trans-Siberian Railway* in 1905 which caused delays during the Russo-Japanese War, although both these issues were solved over time.⁸⁰ The integration of the army's railway battalions with civilian railways aided the solution of these problems, especially as the railway battalions were used in peacetime for railway construction alongside civilian contractors. Russian colonial expansion gave the army further experience in operating

⁷⁸ M.P. Milovsky, *Istoriia tyla i snabzheniia Russkoï Armii* (Moskva: Voennaia akademiia tyla i snabzheniia, 1955), 172–75.

⁷⁹ Wolmar, *Engines of War: How Wars Were Won and Lost on the Railways*, 90–91.

⁸⁰ Pratt, *The Rise of Rail-Power in War and Conquest, 1833-1914*, 216–20.

transport in difficult conditions, such as the desert march to Khiva in 1873 which was reliant on camels and their local guides.⁸¹

While there were a certain level of supply problems and corruption, nonetheless it has to be recognised that in the period between the creation of railways in 1825 and the First World War in 1915, the Russian Army was attempting a feat that only the Union Army had attempted before.⁸² To fully support and supply an army at a distance using railways and *convoys* or *expeditions*. The French in northern Italy, the Prussians in Denmark, Bohemia and France in 1870 and again in 1914, all lived off local resources and had minimal use for railways except for mobilisation to their frontiers.⁸³ Nothing illustrates the Prussian dilemma better than the *Siege of Paris* in 1870, when Prussians armies won the mobile, opening phase of the war by using local resources, only to be immediately followed by logistical collapse when their armies halted and laid siege to the city of Paris, through lack of preparation in the necessary railway support to provide *convoy* supply.⁸⁴ Nor was the lesson learnt, as the German campaigns in 1914 and again in 1939 to 1941 all suffered from a lack of investment in logistics and integration with civilian railway authorities to provide sufficient *convoy* supply.

As Pratt points out, the Russian effort in building a 229-mile railway in 1877 can be compared to the similar Prussian Army efforts to build a 22-mile line around the fortress of Metz in 1870 which failed, with a badly built line suffering from frequent derailments.⁸⁵ Lack of knowledge, underinvestment and a lack of integration with

⁸¹ Alexander Morrison, *The Russian Conquest of Central Asia. A Study in Imperial Expansion, 1814 - 1914* (Cambridge: Cambridge University Press, 2021), chap. 7.

⁸² Bruce W. Menning, *Bayonets before Bullets: The Imperial Russian Army 1861–1914* (Bloomington, IN: Indiana University Press, 1992), 81–84 & 195–97.

⁸³ van Creveld, *Supplying War*, 2004, chap. 4.

⁸⁴ Addington, *The Blitzkrieg Era and the German General Staff, 1865-1941*, 9–22.

⁸⁵ Pratt, *The Rise of Rail-Power in War and Conquest, 1833-1914*, 112–13.

civilian contractors doomed the project to failure. It was 1915 that provided a necessary re-evaluation to European armies that changed the nature of warfare forever. Suddenly these European armies had to mobilise their economies to meet the new and growing demands of industrialised warfare and to link those factories to the front-line using railways.⁸⁶ Use of *convoys* became universal, with armies struggling to move more than 130 km away from a railway line and their rates of advance tied to the speed of railway restoration. But both the Americans and Russians had dealt with these issues some fifty years earlier and had created more innovative solutions using railways for long-distance supply and mixing *convoy* and *expedition* methods.

German Army supply in comparison

By 1941 at the start of *Operation Barbarossa*, the German Army had a supply system firmly based around *convoy* supply and connected to railways.⁸⁷ Yet this system did not work well despite being reformed after the 1940 French campaign. It suffered from two serious problems, one institutional; the commander of railway transport (*Chef des Transportwesens*) Rudolf Gerke, came under the High Command of the Wehrmacht (OKW), while the command of the supply service and motor transport came under the High Command of the Army (OKH) and the quartermaster general (*General Quartiermeister*) Eduard Wagner, which created friction.⁸⁸ The second problem was operational; the railways were not well integrated between the army and the civilian railway authority, the Reich Ministry of Transport (RVM).

⁸⁶ van Creveld, *Supplying War*, 2004, 128–38.

⁸⁷ van Creveld, chap. 5.

⁸⁸ H.G.W. Davie, 'The Influence of Railways on Military Operations in the Russo-German War 1941–1945', *The Journal of Slavic Military Studies* 30, no. 2 (3 April 2017): 323–33.

The lack of integration was compounded by the decision of the RVW to protect the German economy from railway disruption, by keeping the *Deutsche Reichsbahn (DBR)* within the *Reich* and to operate occupied railways using foreign railway companies under German supervision, such as the French national railway company (*SNCF*) in western Europe or setting up new railway companies to operate the track in Eastern Europe, using native workers and German supervisors.⁸⁹ A train leaving the *Reich* for the front-line in the Soviet Union would pass under the control of the *DRB* in Germany, the *Generaldirektion der Ostbahn (Gedob)* in Poland, *Hauptbahndirektion (HBD) Minsk* in Belorussia, *Feldeisenbahndirektion (FED)* 2 in the Army administrative rear area in Russia and finally the *Eisenbahnpioniere (EBP)* 2 in the front-line area. All of these authorities had different traffic and restoration capacities, often using foreign rolling-stock. By contrast, the Soviet railways (*NKPS*) was a unified national railway under joint military and civilian control, with staff under military jurisdiction and using Soviet-designed rolling stock.

The German Army supply troops, *Nachschubtruppe*, operated at all levels of the army right down to divisional level. The main supply commands under the *Generalquartiermeister* at OKH were at Army and Divisional level, although for the German-Soviet War, a Supply Control Staff (*Leitstab*) was established at Army Group level for coordination purposes.⁹⁰ The supplies were collected in the *Reich* by the Replacement Army and issued to the *Nachschubtruppe*, who transported them forward

⁸⁹ Alfred C. Mierzejewski, *The Most Valuable Asset of the Reich: A History of the German National Railway Volume 2: 1933-1945* (Chapel Hill, NC: University of North Carolina Press, 2003), 149-150; Hans Pottgiesser, *Die Reichsbahn im Ostfeldzug 1939-1944, Die Wehrmacht im Kampf*, Band 26 (Vowinkel Verlag, 1961), 54-61 tables 140-142.

⁹⁰ Toppe, *T-8 Problems of Supply in Far Reaching Operations.*, vol.1 Army supply system; vol.5 Control Group Centre; vol.24 German supply troops.

on trains, organised in co-ordination with *Chef der Transportwesens*. Before the launch of Operation Barbarossa, these would arrive at *Supply Districts (Versorgungsbezirk)*, large groups of depots based around a railway line, with internal transport provided by the National-Socialist-Motor-Corps (*NSKK*).

As the German Army advanced deeper into the Soviet Union, further Supply Districts were established, for instance at Minsk and Smolensk, which were filled up from railway trains.⁹¹ The Supply Districts moved supplies forward to the armies either by railway line or by using the units of the Large Transport Area (*Grosstransportraum* or *GTR*) in the initial weeks of the operation.⁹² The armies stored the supplies in Army Depots in order to respond to future demands from the divisions in the front-line. These depots were positioned at the rail-head around 70km from the front-line and the six to ten Heavy Transport Columns (60-tonne) with 3-tonne lorries would carry the supplies forward to the Divisional Unloading Area on a daily basis using a *convoy* system.⁹³ From the Divisional Unloading Area, supplies would be issued to combat units as requested using the six Small Transport Columns (30t) with a mix of lorries and horse-drawn wagons. The rail-head was kept moving forward by the Railway Pioneers (*Eisenbahnpioniere*) to keep it within 70-100 km of the combat units; however, they failed to build-up railway capacity to carry forward more than basic stocks of munitions and fuel.

⁹¹ Horst Boog et al., *Germany and the Second World War*, ed. Ewald Osers, trans. Dean S. McMurry and Louise Wilmott, vol. 4 (Oxford: Clarendon Press, 1998), 297-298.

⁹² Toppe, vol. 24; pp.261-67.

⁹³ Josef Windisch, *Die deutsche Nachschubtruppe im zweiten Weltkrieg* (Rosenheim: Obb. Volksbl., 1953); 'H.Dv. 90 Versorgung Des Feldheeres (V.d.F.) Teil I, Band 2', (Berlin:1939,) RHD 4/365' Bundesarchiv, Berlin; 'H.Dv.g. 90 Versorgung des Feldheeres (V.d.F.) Teil II (geheime)', (Berlin: 1941,) SWB catalog, 424029928, Württembergische Landesbibliothek, <http://digital.wlb-stuttgart.de/purl/bsz492888116>.

While at first glance the German supply system looks very similar to the Red Army one, with its Centre Bases of the *NKO* as an analogy for Supply Districts, in reality, the two are quite different.⁹⁴ The German supply system was a ‘pull logistics’ one, where divisions kept a manifest of all their supplies and equipment and reported shortages to the Army Supply Officer on a daily basis. The Army or Supply District would aim to fill these shortages within a matter of days, because German Army divisions were expected to be on continuous active service for months on end. Daily trains would arrive at the Army depots with supplies from the Supply District and large stocks would be held at Division and Army level. For example, the artillery ammunition held by the Artillery Regiment of an Infantry Division (1st Wave) weighed 147 tonnes, while a further 187 tonnes were carried by the Divisional columns.⁹⁵

By contrast the Red Army supply system was a ‘push logistics’ one, where the Centre determined where supplies should be sent, rather than reacting to reports from divisions as in the German case. The Centre Bases of the *NKO* represented the forward stocks of *Stavka* *VGK* and could only be released by orders from the Centre. Red Army divisions were expected to operate in combat operations until worn down and then be replaced by a second echelon and not be in continuous operations as their German counterparts were. Given this, Red Army armies were given a fixed quantity of supplies at the start of an operation and then expected to carry it out using these

⁹⁴ H.G.W. Davie, ‘Managing Shortage: The Role of Centre Bases of the *NKO* in Overcoming Supply Constraints in the Red Army, 1941–1945’, *The Journal of Slavic Military Studies* 37, no. 1 (1 February 2024): 53–79.

⁹⁵ Alex Buchner, *The German Infantry Handbook 1939-1945* (West Chester, PA: Schiffer Publishing Ltd, 2004), chap. 8.

stocks, with requests for additional supplies going through the Front command to the Rear Staff and *Stavka*.⁹⁶

A feature of this system was that stocks were kept low once the divisions and armies' role was finished, as they often had to live off the remaining stocks from the previous operation for some time. In these periods in-between operations, food supplies had to be gathered from the surrounding area through the local Party administration and food was only supplied at the start of an operation from the Centre Base of the NKO. The Front Base kept a limited quantity of supplies to meet emergencies, such as a sudden German attack, which might sustain its armies for a number of days until the Centre Base NKO could move further supplies forward by railway. Typically, a Front held 0.5 *boekomplekt* which represented about 600,000 shells, more than sufficient for a single army to fight for many days, yet around two days if every army in the Front was attacked at once.

These fundamental differences between Soviet and German supply systems represented their very different approach to warfare. The Red Army used time and distance limited operations at Front level, with sequences of these at the Strategic Direction level to continue the offensive. These operations might achieve a breakthrough to be exploited by a Tank Army which would destabilise the Axis defence and cause a devastating retreat over long distances with the associated disruption. Yet at some point, the offensive pattern would grind to a halt and have to

⁹⁶ H.G.W. Davie, 'Logistics of the Combined-Arms Army—the Rear: High Mobility Through Limited Means', *The Journal of Slavic Military Studies* 33, no. 4 (1 October 2020): 580–607; H.G.W. Davie, 'Logistics of the Tank Army: The Uman–Botoșani Operation, 1944', *The Journal of Slavic Military Studies* 33, no. 3 (2 July 2020): 420–41.

begin again. These pauses built into the system gave time for railway restoration to support future offensives.

By contrast, German armies were expected to conduct continuous operations for long periods and distances. This only worked because the breakthrough battle at the start of an offensive was followed by a rush into the enemy's rear before they were destroyed in an encirclement battle. The following pursuit would outrun railway restoration and divide the *Panzer* Groups from the Infantry Armies, so that the next attack on the enemy second line would be less coordinated and less well supplied. Nor was the solution a greater number of motor vehicles, since the example of the American advance following the Normandy breakout in 1944 showed that this too would outrun its supply lines until railways were restored.⁹⁷

Ultimately, all armies in the Second World War relied on strategic supply routes based on the mass transport provided by shipping and railways. Campaigns had to be structured to take account of these limitations imposed by these mass transport systems and work within them. Motor vehicles offered a possible alternative, yet in reality motor vehicles were constrained by a 'road system' of vehicles capability, the capacity of the road network and maintenance schedules, which limited practical support to around 300 miles. While Germany conducted rapid, short-range strikes against neighbouring countries, these limitations could be ignored, yet once Germany got into a long-duration war (First World War,) or a long-distance one (German-Soviet War,) the lack of preparation would be fatal. By contrast, the Red Army integrated railways into the heart of their military operations and found innovative

⁹⁷ van Creveld, *Supplying War*, 2004, chap. 7.

ways to continue the advance in one sector while another sector's railways caught up. This fundamental understanding dictated the nature of Red Army supply methods to a large extent. But where had this understanding come from?

Foundation of the Soviet Rear

The historiographic conflict in the account of the foundation of the Main Directorate of the Rear (*GUTKA*) between Colonel Skryabin and General Golushko has already been mentioned earlier. The support for Skryabin's account in General Khrulev's unpublished memoirs allows this account to be used in this thesis with some confidence and this account has been based on this sole source.⁹⁸

In 1939, General Khrulev, a protégé of Kliment Voroshilov, returned from Ukraine, where he had waited out the 1937 purges. He was appointed Chief Intendant of the Red Army and he sought out a Red Professor, Konstantin Efimovich Goretsky, former *technical specialist*, Major General in the Imperial Russian Army, Deputy Chief of the General Intendant's Office during the Great War, Assistant Chief of Supply of the Red Army during the Civil War. He was one of a tiny handful of senior Imperial Russian officers, like Boris Mikhaylovich Shaposhnikov (Chief of the General Staff), who had survived the dismissals of 1928 and the purges of 1937 and still retained Stalin's confidence.

Goretsky gave Khrulev three key pieces of advice; firstly, limit the organisations directly subordination to the Intendant's Directorate to those responsible for just

⁹⁸ S.N. Skryabin, 'Iz Istorii Sozdaniia Organov Upravleniia Tylom Sovetskoï Armii', *Voenno-Istoricheskii Zhurnal*, no. 7 (1979): 54–59. For Front reforms see also: S.N. Skryabin, 'Logistical Reorganisation at the Start of World War II Reviewed', *Military History Journal*, no. 4 (1984): 32–38 (JPRS Translation).

food, fodder, clothing and personal equipment, as modern warfare was very complex and could not be managed by a single agency. Leave the complexities of supply administration to the large organisations, such as the Artillery (GAU) and Armoured & Mechanised Directorates (GABTU). Secondly, to control the means of transport so that the flow of supplies could be co-ordinated. Finally, he recommended that they refer to a paper he had written in 1918 as chairman of the Technical Committee of the Central Supply Directorate of the Red Army and also consult the 1914 draft “Regulations on the Field Management of Troops in Wartime” to use as the basis of their scheme for reform.⁹⁹ Khrulev appointed Goretsky his scientific advisor and the two worked together from 1939 onwards.

Towards the end of July 1941, Khrulev and Yakolev (Chief of GAU) approached Anastas Mikoyan (Member of GKO) with their ideas of reforming the supply service of the Red Army.¹⁰⁰ Mikoyan took the proposals to Stalin who agreed with them over the objections of General Zhukov, Chief of the General Staff and on 1st August 1941 NKO orders were issued on the formation of GUTKA and on the Rear of Fronts and Armies.¹⁰¹ The Rear continued to evolve with the introduction of Centre Bases of the NKO in September 1941 and finally with the Rear taking over responsibility for all

⁹⁹ Rossiia Voennoe ministerstvo, *Polozhenie o polevom upravlenii voisk v voennoe vremia* (Sankt-Peterburg: Voennaia Tipografiia Imperatritsy Ekateriny Velikoï (v zdanii Glavnago Shtaba), 1914), <https://warlib.site/polozhenie-o-polevom-upravlenii-vojsk-v-voennoe-vremya-1914/>.

¹⁰⁰ A.V. Khrulev, ‘Stanovlenie Strategicheskogo Tyla v Velikoï Otechestvennoï Voïne’, *Voennno-Istoricheskii Zhurnal*, no. 06 (1961): 64–80.

¹⁰¹ ‘Prikaz Nko № 0257c 1 Avgusta 1941 G. Ob Organizatsii Glavnogo Upravleniia Tyla Krasnoï Armii i Upravlenii Tyla Frontov i Armii’, 1 August 1941, f.558 op.11 d.462 l.013, Rossiiskii gosudarstvennyi arkhiv sotsial’no-politicheskoi istorii (RGASPI), <http://sovdoc.rusarchives.ru/sections/personality/cards/11989/images>; ‘Prikaz NKO № 0258c 1 Avgusta 1941 G. O Naznachenii Nachal’nikov Tyla Frontov’, 1 August 1941, f.558 op.11 d.462 l.015, Rossiiskii gosudarstvennyi arkhiv sotsial’no-politicheskoi istorii (RGASPI), <http://sovdoc.rusarchives.ru/sections/personality/cards/11989/images>.

deliveries from the Centre to the Divisional Exchange Points (DOP) from the middle of 1943.

The key feature of *GUTKA* was that it was a distribution system rather than a full logistics one, concerned with gathering outline information on the state of supplies and based around control of all of the means of transport under *VOSO*. Under this scheme, *GAU*, *GABTU* and other major departments were left to administer their own affairs, however they depended the Rear to move any materials forward to the front-line and the Chief of the Rear of Fronts and Armies had full control over all matters of supply in their area.

This last feature was seen in the 1914 draft regulations; however, it should be noted that these had never been enacted and the Imperial Russian Army had used the 1890 Regulations during the First World War. The development of the supply services of the Imperial Army started after the Crimean War with Minister of War Miliutin's reforms which produced a markedly better performance during the Russo-Turkish War of 1877, especially in terms of medical provision.¹⁰² New regulations on supply were published in 1868 and revised in 1876 but they had only started to address the structural issues such as the lack of depots in the border military districts.¹⁰³ However, the reliance on civilian contractors during the war, led to corruption, so the following War Ministers, Vannovskii and Kuropatkin, regularised military supply and brought it all under the control of the army with the 1890 regulations.

Yet they were less successful in getting the government to build militarily useful railways because of Russia's perennial lack of capital and foreign investors would only

¹⁰² Menning, *Bayonets before Bullets: The Imperial Russian Army 1861–1914*, pp.82.

¹⁰³ Milovsky, *Istoriia tyla i snabzheniia Russkoï Armii*, pp.153.

build economically useful railways. This was the limiting factor in the next war, the Russo-Japanese War of 1905, where again supply was revealed as a Russian army weakness.¹⁰⁴ The reforms following this war led to the 1914 Regulations which had not been implemented before the start of the First World War.

The Russian Army reformers were greatly influenced by the observation of Prussian/German wars by military attaches; while no attaches were sent to observe the American Civil War.¹⁰⁵ Nonetheless, Russian cavalry was greatly influenced by the American Civil War through the writings of authors like Danilov, which led to the concept of 'strategic cavalry' in 1920s.¹⁰⁶ So currently, it is unclear what, if any, foreign influence had on the issues of supply and transport. It's unlikely that the Prussian *laissez-faire* approach to logistics was of much use, however it is credible that some lessons were drawn from the American Civil War and incorporated into Imperial Russian thinking, just as the cavalry lessons were.

Red Army supply in context

Economic studies of the Soviet Union during the German-Soviet War have identified the successful mobilisation of its smaller economy; coupled with an evacuation of 1,500 key industrial concerns, as key elements in the success of the Soviet Union in manufacturing the weapons it needed during the war. However other researchers have identified parts of the economy that did not perform so well. The chemicals industry

¹⁰⁴ Harold Shukman and Felix Patrikeeff, *Railways and the Russo-Japanese War: Transporting War* (London: Routledge, 2007), 95 & 101–3.

¹⁰⁵ Gundrun Persson, *Learning from Foreign Wars: Russian Military Thinking 1859-73* (Helion & Company Ltd, 2010), chap. 4.

¹⁰⁶ N.A. Danilov, *Kampaniy Granta 1864 i 1865 gg.* (St. Petersburg: 1899); Evgeniï Drig, *Voïskā Semena Mikhaïlovicha: istoriia organizatsionnogo stroitel'stva strategicheskoi konnitsy RKKA*, (Moskva: Russkie vitiāzi, Moskva, 2018).

was too small to meet the needs for propellant powder and high explosives; after the destruction of the Baku oilfields, oil products were more limited; and after the loss of Ukraine, food was always in short supply, so that feeding soldiers meant starving civilians.

Limited resources in certain key areas were only part of the problem, because the Soviet 'warfare state' had evolved a method of waging large-scale wars, that required fighting along three 'strategic directions' simultaneously, and at a high tempo of operations. Balancing these two competing, mutually exclusive factors, was key to the Soviet Union winning the war, and the role of *Stavka* and *GKO* have been known for some time. What remained to be studied, was how this scheme operated 'on the ground' and this was where the Rear played a key role; balancing the flow of resources from the Centre, with the ambition of *Stavka* to fight the war as aggressively as possible. Unless this was successfully carried out, and the resources used efficiently and not squandered, the slim margin of victory for Soviet Union could easily have disappeared, particularly in the early years.

What is surprising is that the Soviet military theoreticians of the 1930s had not worked out the logistical arrangements in their war-fighting plans.¹⁰⁷ The supply arrangements for the pre-war operations and opening months of the German-Soviet War were characterised by waste and confusion. So, the evolution of successful logistics only began after August 1941 and continued up until June 1943, with the change to the 'army rear' delivering supplies as far as the 'divisional exchange points' (*DOP*). One of the key steps in this evolution was the creation of the first Centre Base

¹⁰⁷ G. S. Isserson, *G.S. Isserson and the War of the Future: Key Writings of the Soviet Military Theorist*, trans. Richard W. Harrison, Translation edition (Jefferson, NC: McFarland & Co, 2016), pp.220.

NKO at Vologda in September 1941, to manage the supply into besieged Leningrad and the fronts outside the city. A similar method was used to allocate scarce munitions reserves during the Battle of Moscow when the munitions shortage was at its height and thereafter Centre Bases were adopted for all 'strategic directions'. With minimum stocks held at army and front level, Centre Bases represented the forward placement of 'national reserves', yet were close enough to deliver to the armies within days.

With this scheme, the *Stavka* and the *GKO* had the tools for resource allocation, national stocks were only released to fronts and armies 10 days before the start of an operation; the flow of materiel from the centre could be directed first to one front in a 'strategic direction' and then to another. Military activity could be matched to national production, wastage could be reduced, national reserves could be small and kept moving on railway wagons, rather than piling up in warehouses; a dynamic system, controlled by the Staff of the Rear and directed by the General Staff and *Stavka*.

The system had influence as far down as army level, as quiet sectors of the front had to survive on the stocks they had left over from the last operation, and food was gathered from the local area, through the local Party organisation. Fronts held a reserve for expediency, yet armies were only re-equipped, reinforced and filled up to the norms of supply, just before the operation was due to start. Nor was there a continuous supply during an operation, rather army dumps were built up at the rear edge of the 'divisional rear area' before the start of the operation and the army was expected to meet its objectives from the norms allocated to it. Behind it, the Centre Base now turned the flow of materiel to another Front to prepare for the follow-on operation.

Combined-arms armies supported by the *Stavka Reserve* artillery, created the breach in the enemy line with an artillery barrage that used 2/3rd of the norm of munitions, then fought through the further lines of defence, fought off the enemy reserves and then conducted a pursuit into the enemy rear areas. Tank armies were completely motorised and were supposed to transit the enemy lines without engaging them, slipping off into the enemy operational rear intact, to capture bridgeheads across rivers, far behind the front-line.

In both cases, the armies were expected to conduct an *expedition*, loading up all the transport and living off this mobile depot or the local area or captured enemy depots, until they could reconnect with a railway line. The limited army transport had sufficient capacity to evacuate the wounded, and meet critical shortages, yet nothing like the amount needed to keep the army supplied on a day-to-day basis. The distances were just too far for the amount of transport and growing larger every day. Supply could only be re-established once the railway lines had been repaired and the army base moved forward and re-connected with the front base. This role was the responsibility of the front which used the Railway Brigades and Main Directorate for Military Reconstruction (*GUVVR*) to rebuild the shattered infrastructure in the first instance and later to build capacity so that the front base could follow on behind the advancing army bases.

This was a key factor; the militarised *NKPS* worked closely with both the 'operational army' and the Rear in both the management of the railways and their reconstruction using the *GUVVR* for the heavy engineering work. The integration of railways and military was a major reason why the mobility of the Red Army improved in the last two years of the war. Yet the full restoration of railways took time and, in

the interval, it was the responsibility of the front to stitch together a supply route from the front base to the army bases and ultimately the division *DOP*. Fronts achieved this by utilising captured railways and rolling stock, converting from European to Union gauge and using Soviet trains on partially restored track.

Fronts would use some of their Motor Transport Battalions to carry high value items from the front base to the *DOP*. Their principal role was in supporting the railways, bridging gaps by carrying materiel over a pontoon bridge from one railway to another, clearing bottlenecks by carrying material forward to the next station, or by transporting railway building materials. After March 1944, when tank armies started to successfully conduct 'deep operations', the resultant rapid retreat of Axis forces meant that they were unable to conduct extensive railway destruction except in the immediate front-line area. With railways restored far quicker, the combined-arms were able to sustain their pursuit longer and ultimately, fronts were able to conduct sustained operations over extended periods.

The fact that offensives were time and distance limited did not matter as there would be another operation ready to be launched by a neighbouring front to continue the sequence. In addition, this released the individual operation from the responsibility of success or failure; rather groups of operations, or strategic operations or campaigns determined success. This scheme addressed a problem which had dogged armies since the First World War, that no matter how successful a breakthrough, the pursuit always ran out of momentum as shown in Brusilov's 1916 offensive.

The Soviet system of sequential operations also solved the problem of integrating horse-drawn and motorised forces that had so bedevilled the German army in 1941-2. The horse-drawn combined-arms armies carried out the

breakthrough, together with their integral armoured forces of tank regiments/brigades. This left tank armies to concentrate on their deep penetration mission and the only co-ordination required, was for the combined-arms armies to eventually catch up with the tank armies. By contrast, German efforts to co-ordinate use of infantry armies and *panzer* groups either failed or restricted itself to short range encirclements and their lack of attention to logistics limited the scope of their operations as well, tying infantry armies to railway lines.

This thesis has argued that the Rear was not a typical logistics organisation, instead it took a unique approach to the problems it faced and tried to use its slender means efficiently. Its focus on 'distribution' instead of 'logistics and administration', allowed it to operate with a small, nimble organisation which proved crucial to its success in dealing with a high tempo war and the complexities of a modern war when compared to the relative simplicity of the First World War. This distribution focus was key when dealing with the problems of resource allocation.

The resources of the Soviet Union were too slender to be sitting in warehouses and depots gathering dust; this productive capital was needed by the fighting troops as soon as it was made. In effect, this was a 'just-in-time' system, with little inventory held in storage. Most of the 'stock' was mounted in railway wagons and in transit to a destination, either with the 'operational army' or with the military districts. It could be diverted to another destination but it was already on its way to somewhere. Combined-armies only held stocks left over from the last operation together with emergency stocks and fronts held enough supplies to operate a number of days, so the Centre Base *NKO* represented the major stockholding in the military system.

This represented a stark contrast with Western logistics systems which mandated fixed levels of stocks at all command levels, based on estimated expenditure levels and assuming a certain number of days of independence before resupply was needed. Not only did this require divisions to carry round large stocks, it meant that armies and army groups had to maintain large depots and deliver supplies constantly to the divisions even if they were not engaged in operations. While the British and American armed forces delivered literally everything to their troops from the home countries, countries like Germany and Italy drew a proportion of food stocks from the local area which helped reduce the transport demand. Yet even here, large amounts of war materiel were tied up in stocks with inactive units or in the depots of higher formations which forms a strong contrast with the Soviet system which sought to reduce stocks by meeting demand from items in transit.

Conclusion

In 1928, the Soviet Union sought to build a 'warfare state' that linked the economy and society with the military and developed plans to fight 'future' wars with the resources of this state. This scheme to fight a large-scale, high-tempo European war was put at risk by the German invasion of 1941 because of the damage inflicted on the Soviet economic output, so a way had to be found to allocate the limited resources to meet the needs of the military campaign. Yet the Soviet military had not discovered a successful technique for logistics, by the start of the war. This could have been a fatal error but for a combination of Imperial Russian experience and Soviet innovation, which started to evolve a system in August 1941 and completed it by June 1943.

The system that appeared was both unique and innovative, reflecting the Red Army's need to fight a vast war over continental distances using railways. This required close integration between the military and transport authorities and a flexibility to meet changing needs at the front-line within a matter of days. It needed to be efficient and hold little in way of stocks, a just-in-time system, a direct flow of materiel from factories to the fighting troops.

The second challenge facing the Red Army was to conduct the war using railways efficiently; to disable the railways during the retreats of 1941-2, to restore them quickly in 1942-3 and to find ways to stop the Germans disabling them during their retreat in 1944-5. The fact the Soviet Union was able to launch an attack against the Japanese forces in Manchuria in August 1945, having just finished the war in Germany in May, is testament to this strategic reach and operational flexibility.

The other transport challenge for logistics and mobility was the lack of motor transport. While the six tank armies and many *Stavka* Reserve artillery units were fully motorised, the 60 combined-arms armies were largely horse-drawn, just like the contemporary German Army. The requirement was to make the combined-arms armies independent of railways albeit for a limited period, to give them both mobility and independence from fixed supply lines. This was done using an *expedition*, utilising the limited transport fleet to march alongside the combat troops in order to gain tactical and operational freedom.

Finding solutions to these logistical and transport challenges, enabled the Red Army to implement its pre-war ideas of fighting a large-scale, high-tempo war. *Stavka* could match the output of factories to the tempo of operations at the front-line; the railways could carry the armies forward into enemy territory and those armies were

sufficiently flexible and mobile to defeat their German opposite numbers. This was all done, despite the fact that the Soviet economy was smaller than the German one and was weak in some key sectors. Support by the western Allies through Lend-lease helped of course, but it was the use of innovation and the structures and institutions created by the Red Army that really made it happen. This body of work demonstrates General Andrei Vasilyevich Khrulov and the soldiers and officers under him, created a remarkable modern logistics system and it's hard to see the Red Army winning the war without it.