

The Faustian Pact: Soviet-German Military Cooperation in the Interwar Period

DISSERTATION

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Ian Johnson

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Dissertation Committee:

Jennifer Siegel, Advisor

Peter Mansoor

David Hoffmann

Alan Beyerchen

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Abstract

This dissertation analyzes secret military cooperation between the Soviet Union and Germany from 1920 until 1933. Both states found themselves internationally isolated after World War I. Unable to meet their own security needs – despite immense ideological differences – they turned to each other in an unlikely partnership. Together, they established a network of secret military bases, testing grounds and laboratories inside Russia, where they jointly developed new aircraft, armored vehicles, and chemical weapons.

Their work together provided a dark glimpse of the future: Soviet military intelligence reports chronicled the rise of pro-Nazi sentiment among the German officers. German intelligence in turn described the growing cult of Stalin and the scenes of mass starvation unfolding right outside the gates of their facilities in the wake of collectivization. And both sides practiced human experimentation in their joint chemical weapons facilities. But cooperation between the two states was more than just a harbinger of what was to come: the new ideas, technologies, and factories developed in this period of cooperation would serve a vital role in the course and conduct of the coming war. At its core, the interwar exchange of Russian space for German technology was a wager upon which the Second World War depended.

Dedication

To my parents

Acknowledgments

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Vita

June 5 1987Born Edina, Minnesota

May 2005Trinity High School at River Ridge
Bloomington, Minnesota

May 2009B.A., History and Government, *cum laude*
Claremont McKenna College
Claremont, California

May 2012M.A., History, The Ohio State University

May 2012 to presentGraduate Teaching Associate, Department
of History, The Ohio State University

Publications

“The Fire of Revolution: A Counterfactual Analysis of the Polish-Bolshevik War,” *Journal of Slavic Military Studies*. Volume 28, Number 1 (March 2015).

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Fields of Study

Major Field: History

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LIST OF ABBREVIATIONS

ARCHIVES

AAN	Archiwum Akt Nowych, Warsaw, Poland
BA-L	Federal Archive Berlin – Lichterfelde, Berlin
BA-MA	Federal Archive –Military Archive, Freiburg
DBCA	Daimler-Benz Corporate Archives, Stuttgart
GALO	State Archive of Lipetsk Oblast, Lipetsk
GARF	The State Archive of the Russian Federation, Moscow
HIA	Hoover Institution Archives
JPI-L	Josef Pilsudski Institute, London
JPI-NY	Josef Pilsudski Institute, New York
KA	Thyssen-Krupp Corporate Archives, Essen
MAN	M.A.N. Corporate Archives, Augsburg
NARA	National Archives at College Park, Maryland
NWCA	Naval Historical Collection, Naval War College Archives, Newport, Rhode Island
PA-AA	Foreign Ministry – Political Archives, Berlin
PCA	Porsche Corporate Archives, Stuttgart
RGASPI	The Russian State Archive of Socio-Political History, Moscow
RGAE	The Russian State Archive of the Economy
RGVA	The Russian State Military Archives, Moscow
TNA	The National Archives, Kew
TsGASO	The Central State Archive of Samara Oblast, Samara
Y-RAP	Yale Russian Archive Project, New Haven, Connecticut

GERMAN ABBREVIATIONS

AA	Auswärtiges Amt (German Foreign Ministry)
AG	Publicly Traded Limited Corporation
BMW	Bavarian Motor Works
DDP	German People's Party
F.u.G.	Command and Combat of the Combined Arms
GEFU	Society for the Promotion of Commercial Enterprises
GELA	The Society for Agricultural Products, cover name for German military production in the Soviet Union
IAMCC	International Allied Military Control Commission
IvS	Engineering Office for Shipbuilding, secret German naval organization in the Netherlands
IWG	Inspectorate for Weapons and Equipment
KPD	The German Communist Party
KWI-PCE	Kaiser Wilhelm Institute for Physical Chemistry and Electrochemistry

M.A.N. SE	Machine Factory Augsburg-Nürnberg
NSDAP	Nazi Party
Russgetorg	The Russian-German Trading Company
RWM	Reich Ministry of the Economy
SPD	Social Democratic Party
USPD	Independent Social Democratic Party
Wa. Prüf.	Weapons Testing Office
WIKO	Central Business Office, code name for divisions of Moscow Center
WIVUPAL	The Scientific Research and Test Establishment for Aircraft, German code name for Lipetsk
Z.Mo.	Moscow Center, the secret German military headquarters in Moscow

RUSSIAN ABBREVIATIONS

BUZ	The Red Army's Armored Warfare University
CHEKA	Emergency Committee, first Soviet State Security Organization, 1917-1922
GAU	Main Artillery Department
GDD	Long Range Action Group
GKB-OAT	Main Design Bureau of the Arsenal Gun Trust
GPU	State Political Directorate, Soviet State Security Organization, 1922-1923
GRU	Main Intelligence Directorate
NKPS	The People's Commissariat of Foreign Trade
NKTIp	The People's Commissariat of Trade and Industry
NKID	The People's Commissariat for Foreign Affairs
NKVD	The People's Commissariat of Internal Affairs, Soviet State Security Organization, 1934-1946
NKVT	The People's Commissariat of Ways of Communication
OGPU	Joint State Political Directorate, Soviet State Security Organization, 1923-1934
OSOAVIAKhIM	Society for Defense, Aviation and Construction of Chemical Weapons, Soviet code name for Kama
RVS	Revolutionary Military Council
RKKA	The Workers' and Peasants' Red Army
RKKF	The Workers' and Peasants' Red Fleet
SNK	Council of People's Commissars
SR	Socialist Revolutionary (Political Party)
TEKO	Technical Courses of the Society for Defense, Aviation and Construction of Chemical Weapons, Soviet code name for Kama
TsGASI	Central Aerodynamics Institute
UMM	Bureau of Motorization and Mechanization
VOKhIMU	The Military-Chemical Defense Committee
VRK	Council of People's Commissars on War and Naval Affairs
VSNKh	The Supreme Soviet of the National Economy
VVS	Air Force of the Red Army

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INTRODUCTION

Scene 5, Goethe's Faust
Mephistopheles: I'll be your servant here, and I'll
Not stop or rest, at your decree:
When we're together, on the other side,
You'll do the same for me.

THE FAUSTIAN PACT

In the early hours of June 22, 1941, the rumble of plane engines and thunderous explosions woke Soviet residents in Kiev, Minsk, Bialystok and dozens of other cities. It was the beginning of *Unternehmen Barbarossa*, the largest military operation in the history of the world. More than three million German soldiers would soon be on Soviet soil. This expansion of Hitler's war turned World War II into the bloodiest conflict in human history.

Two brief decades before, Germany was utterly defeated. Foreign troops occupied its industrial heartland. The victorious Allies completely dismantled the vaunted Imperial German Army, reducing it to only 100,000 men. The Treaty of Versailles forbade Germany from producing or purchasing aircraft, armored vehicles, and submarines. In 1933, when Hitler came to power, all of these strictures were still in effect. Yet six years later, Hitler possessed an army of 4.2 million men, armed with some of the most advanced technology in the world. How did Germany rearm so rapidly?

The answer lies in the Soviet Union. After its victory in the Russian Civil, the new Soviet regime found itself internationally isolated and in need of technical assistance to rebuild its economy. Bolshevik leaders – particularly Trotsky, the head of the Red Army – sought expertise in developing military industry to ensure the survival of the new regime. In 1920, when Soviet envoys began to seek military equipment from the *Reichswehr* (the Weimar Republic’s military), they discovered an eager partner in circumventing the post-war status quo.

It is hard to overstate how much the future partners despised each other. Lenin called the German military “savages,” “plunderers,” “predators” and noted that in the First World War “the German robbers broke all records in war atrocities.”¹ He thought even less of the German Social Democrats who ran the Weimar Republic after 1918, singling them out as “heroes of philistine stupidity and petty-bourgeois cowardice.”² After the Social Democrats ordered the *Reichswehr* to suppress the first major attempt at communist revolution in January 1919, Lenin wrote that “no words can describe the foul and abominable character of the butchery perpetrated by alleged socialists.”³ Trotsky wrote after another failed revolution in 1923 that “The real machinery of state in Germany at the present time is General Seeckt, who is familiar with the machinery for

¹ Vladimir Ilyich Lenin, *Collected Works: Volume 28, July 1918-March 1919*, translated and edited by Jim Riordan (Moscow: Progress Publishers, 1965), p. 42, 52, 54, 64.

² *Ibid.*, p. 434

³ *Ibid.* Lenin described the Weimar Republic as a sham: “The present “freedom of assembly and the press” in the “democratic” (bourgeois-democratic) German republic is false and hypocritical, because in fact it is freedom for the rich to buy and bribe the press, freedom for the rich to befuddle the people with the venomous lies of the bourgeois press, freedom for the rich to keep as their “property” the landowners’ mansions, the best buildings, etc.”

⁴ Lenin, *Collected Works: Volume 28*, p. 434.

exterminating the masses.”⁵ For the Bolsheviks, the right-wing military officers who dominated the interwar German army were archetypes of counterrevolution.

The German officer corps was somewhat more circumspect in articulating its hatred of Bolshevism, at least in their memoirs.⁶ General Wilhelm Groener referred to Lenin and Trotsky as “enemies” and the “devil.”⁷ General Hans von Seeckt used similar language in his writings.⁸ More expressively, a German veteran and Reichswehr non-commissioned officer would write in 1927 that

The rulers of present-day Russia are common blood-stained criminals; that they are the scum of humanity which, favoured by circumstances, overran a great state in a tragic hour, slaughtered and wiped out thousands of her leading intelligentsia in wild blood lust, and now for almost ten years have been carrying on the most cruel and tyrannical regime of all time.⁹

This view was more or less the common one among the Reichswehr’s officers and NCOs. Many of them were drawn from right-wing *Freikorps* of veterans who banded together to put down the left-wing insurrections of 1918 and 1919.

⁵ Leon Trotsky, “The Present Situation and Our Tasks in Building the Army,” October 21, 1923, in *Peace*, p. 228

⁶ Lenin and Trotsky left dozens of volumes of vitriolic speeches which make for better quotations. Seeckt left only his compiled writings and letters.

⁷ Wilhelm Groener, *Lebenserinnerungen: Jugend, Generalstab, Weltkrieg*, edited by Friedrich Frhr. Hiller von Gaertringen, (Göttingen: Vandenhoeck und Ruprecht, 1957), pp. 469-472.

⁸ Even before the Bolshevik Revolution, Seeckt had advocated the expulsion of 20 million Russians and “riffraff of Jews, Poles, Masurians, Lithuanians, Letts, Esthonians, etc,” from the former Tsarist Empire. This region, he continued, should then be resettled with ethnic Germans: ‘Once there are 200 millions of healthy and mostly German people,’ Germany would be permanently secure in the east. Gustav Hilger, Alfred G. Meyer, *The Incompatible Allies: A Memoir-History of German-Soviet Relations, 1918-1941* (New York: Hafner Publishing Company, 1971), pp. 191-192.

⁹ Adolf Hitler, *Mein Kampf [My Struggle]* (New York: Reynal and Hitchcock, 1941), p. 479. This view was more or less representative of the Freikorps members from whom much of the army was drawn between 1919 and 1921. Hitler was discharged from the Reichswehr during one of its last draw-downs at the end of March 1920. This work was written beginning in November 1923. Hitler devotes several pages at the end of *Mein Kampf* arguing vociferously against a military alliance with the Russians, rumors of which had reached him.

Why did two states whose leaders saw each other as Mephistopheles – the embodiment of evil – make a deal with one another? Each side offered the other a taste of forbidden fruit. The Soviet Union, devastated by war and internationally isolated, sought desperately needed technical expertise, financial capital and new military technologies, which only the Germans were willing to provide in quantity. For the Germans, an alliance with the Soviets held out the best possibility of secret rearmament and a war of revenge. Thus, circumstances thrust together these ideological opponents. The two pariah states began to exchange military envoys, intelligence and technology in 1920. On April 15, 1922, Soviet Russia and Weimar Germany signed the Treaty of Rapallo, normalizing diplomatic relations with each other. Five months later, People's Commissar for Military and Naval Affairs Leon Trotsky and German General Hans von Seeckt formalized an arrangement to initiate secret military cooperation. This project, which was partially concealed from the German government until 1927, would grow enormously in scale, involving at its peak thousands of German and Soviet officers, as well as Germany's largest industrial firms. Through their alliance, Germany gained the space to rebuild its army. In return, the Soviet Union received vital military, technological and economic assistance.

This covert arrangement centered at first on economic cooperation, as the Red Army encouraged German military industry to relocate experts and banned industrial production to the Soviet Union. The German military served as an intermediary between the Soviet state and German businesses. The Red Army negotiated contracts with 255 German companies in the 1920s, close to the total number of contracts with all other

foreign businesses (277). So closely tied were German military industry and the Soviet state that some German engineers in the Soviet Union were issued Red Army officers' uniforms. They helped to build many of the central showpieces of Stalin's first Five Year Plan, such as the Fili Aviation Plant in Moscow and Bolshevik Factory Number 232 in Leningrad. As a result, by 1933, Germany had become the Soviet Union's most important trading partner. Military cooperation thus played a key role in the industrialization of the Soviet Union.

As the relationship grew, the Red Army and Reichswehr also established a number of joint military ventures on Russian soil. These included a flight school, an armored warfare testing ground, as well as two chemical weapons laboratories. These sites provided a vital space for the Reichswehr to train young officers and develop new technologies. For the Soviets, the role of these facilities was even more profound: during this period of cooperation with Weimar Germany, the Soviet Union completely changed its military tactics, operations and training procedures. And further, German experts helped to educate thousands of Red Army engineers, pilots, mechanics and scientists. Interwar Soviet technology drew heavily from German designs in aviation, naval and armored warfare, artillery and chemical weapons. The Red Army was reborn during this period of cooperation, with more than a few German features.

Further, the joint Soviet-German chemical weapons laboratories were more than experimental facilities. Drawing on their research and personnel in Russia, the German military transferred chemical weapons to Spain, where they were used during the Rif War in Spanish Morocco in the early 1920s, and to China, where they were used in the

Chinese Civil War during the late 1920s. German observers then reported the results of these “tests” back to the Soviet-German chemical weapons lab deep inside Russia at Tomka, near the Kazakh border. By 1931, German scientists and engineers were managing about half of the Soviet Union’s vast chemical weapons production program.

In addition to its economic and military implications, the secret alliance impacted the political life of both states. Trotsky, one of the architects of the secret alliance, was forced out of his management of the military – and into opposition and eventual exile – by the so-called “Red Commanders.” This group of young communist military officers thought that his strategic and technological vision of the Red Army was too conservative. Instead, they envisioned massive investment in military technology and mechanization, following theoretical arguments then developing inside Germany. These officers, particularly future Marshal Mikhail Tukhachevsky, would supervise the growth of direct military cooperation with the Reichswehr, frequently visiting Germany and the various secret facilities. Their arguments for an enormous military construction program won the approval of Stalin in 1929. As a result, military-industrial construction was a vital component of the first three Five Year Plans: from 1929 to 1939, Soviet military spending grew from 3.4 percent of the national budget to nearly 33 percent. Early Stalinism was shaped in vital ways by the presence of thousands of German officers and engineers, as well as the importation of German military doctrine.

The Soviet-German military pact had an even larger hand in the rise of Nazism in Germany. The Reichswehr program in Russia was designed to one end: preparing for a new war to defeat France and thus overturn the Treaty of Versailles. The Soviet-German

facilities were paid for out of so-called “black funds”: reserves of money hidden from Germany’s civilian government. In the late 1920s, many officers involved in secret cooperation with the Soviet Union hoped that Hitler would be amenable to the Reichswehr’s goals and began diverting some of this money to Nazi candidates for the Reichstag. Further, Werner von Blomberg, the Reichswehr general who more than any other assisted Hitler in becoming chancellor, had lived and worked at the secret facilities in Russia. He was immensely impressed by the resources devoted to the Red Army after 1929, and concluded that only a similarly dedicated totalitarian regime could restore Germany to *Weltmacht*, or world power.¹⁰ He credited his devotion to Nazism to his experience in the Soviet Union. The radical shift in political attitudes among young German officers and NCOs from 1922 to 1933 was driven in part by the experiences of those who served in the Soviet Union. The views of these residents of Russia was usually less favorable than Blomberg’s, as their memoirs and reports documented the growing cult of Stalin and the scenes of mass starvation unfolding right outside the gates of their bases.

THE HISTORIOGRAPHY

One of the first publications to discuss Soviet-German military cooperation was penned while it was occurring. British journalist, Cecil F. Melville’s 1930 work, *The Russian Face of Germany*, drew from his contacts within the German government. It was

¹⁰ Kirsten Schäfer, *Werner von Blomberg: Hitlers erster Feldmarschall, eine Biographie [Werner von Blomberg, Hitler’s First Fieldmarshall, a Biography]* (Munich: Paderborn, 2006), pp. 169-172.

surprisingly accurate, though he was unaware of two of the joint military bases in Russia. Melville warned his readers that Germany's activities in Russia were aimed at the total rearmament of Germany and would result in another world war. He even predicted that Germany and the Soviet Union would turn on each other during the course of that war, and that Germany would be defeated. But Melville was a Cassandra in his own time, derided by reviewers from such publications as the *Manchester Guardian*.

Besides Melville's work, a number of important memoirs touching on the subject of Soviet-German relations began to appear while the Nazi regime remained in power. The most important of these is Friedrich von Rabenau's *Seeckt: Aus Seinem Leben, 1918-1936* (1941).¹¹ This work consisted of Seeckt's correspondence, with commentary provided by Rabenau, and is an invaluable primary source collection. Some of the immense volume of literature churned out by Leon Trotsky while in exile mentions cooperation with Germany, but in a limited way. The same can be said of Karl Radek's writings.

In the aftermath of World War II, a number of German officers who had participated in cooperation wrote memoirs which mentioned their experiences, notably Fritz Tschunke and Wilhelm Speidel.¹² Shortly thereafter, scholarly monographs

¹¹ This book's author was as remarkable as his subject: an ardent Christian, theologian and highly decorated combat veteran of the First World War, Rabenau remained in the Reichswehr after 1918. Rising to the rank of general, he was dismissed from the German Army in 1942 for his open anti-Nazi views. In the period from 1941 to 1943, he wrote several books on the life and legacy of his mentor, Hans von Seeckt, while also completing a divinity degree. Rabenau was arrested in late 1944 for participating in the plot against Hitler and shot alongside Dietrich Bonhoeffer and Wilhelm Canaris on April 15, 1945. Eight days later, the Flossenbürg Concentration Camp, where he had been held, was liberated by the American Army.

¹² Speidel would also go on to pen a long description of German military activities in Russia, centering upon the flight school at Lipetsk, in an article that appeared in 1953 in the German historical publication *Vierteljahrshefte für Zeitgeschichte* [*Quarterly Journal for Contemporary History*]. That piece remains of considerable value and has been cited here extensively.

appeared for the first time on the subject of the Soviet-German relationship, drawing from these memoirs and newly captured German document collections. The initial academic publication was George H.F. Hallgarten's "General Hans von Seeckt and Russia, 1920-1922," which appeared in *The Journal of Modern History* in March 1949.¹³ Shortly thereafter, Lionel Kochan penned "The Russian Road to Rapallo" (*Soviet Studies*, October 1950), which offered the first approach to cooperation from the Soviet side. These works attempted to pin down the basic chronology of the period of Soviet-German mutual aid.

The first scholarly book on cooperation was E.H. Carr's *German-Soviet Relations Between the Two World Wars, 1919-1939* (1951), which has remained of considerable importance in shaping the debate about cooperation.¹⁴ His source material came almost exclusively from the published memoirs of German diplomats and officials, as well as a handful of Russian memoirs. Carr's work accurately described many of the details of military cooperation during the period from 1919 to 1922, and with some accuracy up to 1927. After that the narrative of military cooperation died away. Carr argued in the conclusion of his work that "the diplomatic recovery, and in part also the military recovery, of Germany after the disaster of 1918 had been achieved through a policy of friendship and cooperation with Soviet Russia."¹⁵ In Carr's work, the diplomatic element

¹³ Hallgarten had the triple misfortune of being a Marxist, of Jewish descent, and the son of a well-known German pacifist in Hitler's Germany. He managed to escape, joined the American Army in 1942 and returned to Germany with the forces of liberation. He would go on to write a number of books about the role of Germany's industrialists in Hitler's rise to power.

¹⁴ In another sign of the general interest in the subject, German-American historian Gerhard Weinberg completed his doctoral dissertation about the Molotov-Ribbentrop Pact the same year.

¹⁵ E.H. Carr, *German-Soviet Relations Between the Two World Wars, 1919-1939* (Baltimore, MD: The Johns Hopkins Press, 1951), p. 137.

was the dominant narrative. Cooperation was used as leverage to increase Germany's bargaining position vis-a-vis the west. This interpretation, while correct from the point of view of the German Foreign Ministry, minimized the goals and activities of the Reichswehr.

Two years later, American historian Alfred Meyer assisted Gustav Hilger, a German diplomat, in publishing his memoirs. Entitled *The Incompatible Allies: A Memoir-History of German-Soviet Relations, 1918-1941*, this work played a major role in the development of historical understanding about the Soviet-German relationship: Hilger, who was born in Moscow to a Russo-German family, spent most of the period from 1914 to 1941 in Russia, either as a prisoner (1914-1917) or as a diplomat. The book, simply put, is an outstanding read. Hilger met every major figure in German and Russian history between 1917 and 1939, and relates countless colorful stories from Count Mirbach's assassination to drunken evenings with Stalin. He provided much more information about secret cooperation between the German Army and the Soviet regime than had been previously available, in part because he had actually assisted in the first negotiations which established the partnership in 1921 and 1922. Yet, as a diplomat, Hilger was soon excluded from knowledge about the covert military relationship. As a result, he significantly underestimated the scope and scale of the facilities in Russia. But the nature of his book has led it to be cited by every historian writing on Soviet-German relations since its release.

In 1954, historian of Germany Hans W. Gatzke released *Stresemann and the Rearmament of Germany*. This included a twelve-page chapter specifically on the

military provisions of Soviet-German cooperation, though it provided little in the way of new details. Four years later he remedied some of his errors with an article, “Russo-German Military Collaboration during the Weimar Republic.” He noted of the published memoirs on which historians prior to his work had relied that

These sources are not very extensive, and the hope that they may some day be supplemented by information from German army records will probably prove vain, since most of the documents pertaining to Russo-German military relations were “regularly and systematically” destroyed. Nor does it seem likely that the Russians will make any revelations about their own share in these top secret operations.¹⁶

Thankfully, he was mistaken on both counts. For his part, Gatzke relied upon German Foreign Ministry documents, particularly those generated by the German Ambassador to Russia from 1922 to 1928, Count Ulrich von Brockdorff-Rantzau. This improved the scope of his work, but maintained fundamental biases that limited its conclusions.

The first major West German study appeared in 1954, Albert Norden’s *Zwischen Berlin und Moskau: Zur Geschichte der Deutschsowjetischen Beziehungen*.¹⁷ It was followed not long after by Gerald Freund’s *Unholy Alliance: Russian German Relations from the Treaty of Brest-Litovsk to the Treaty of Berlin* (1957). These works, like Carr’s and Gatzke’s emphasized the diplomatic nature of the relationship between the two states because of the nature of their sources. As a result of this focus, a historiographic debate

¹⁶ Hans W. Gatzke, “Russo-German Military Collaboration During the Weimar Republic,” *The American Historical Review*, Vol. 63, No. 3 (Apr., 1958), pp. 565-597.

¹⁷ The German-language historiography on the subject of cooperation is rich but varies significantly in subject, theme and quality. The first major treatment of the Soviet-German relations in the interwar period to appear in East Germany was Rolf Elias’ *Die Deutsch-Sowjetischen Beziehungen* (1979), some forty years after the fact. The author was a member of the *Gesellschaft für Deutsch-Sowjetische Freundschaft [Society for German-Soviet Friendship]*, which obviously colored his interpretation. The work largely consists of republished speeches and primary source documents.

continued as to whether or not cooperation was of consequence to either military. Those, like Carr, who viewed it as significant tended to see it as important in large part as a precursor to the Molotov-Ribbentrop Pact. The use of foreign diplomatic sources, such as British Foreign Office papers, only further pushed the argument in that direction.¹⁸

The next wave of publications that appeared in the 1960s continued to rely upon German Foreign Ministry archival material, but drew from a broader base as German Foreign Ministry records became better organized. In 1958, the US National Archives completed the process of indexing the captured interwar records of the German Foreign Ministry; the British did the same with their collections the following year. Two of the best examples of this cycle are Kurt Rosenbaum's *Community of Fate: German-Soviet Diplomatic Relations, 1922-1928* (1965) and Harvey Leonard Dyck's *Weimar Germany and Soviet Russia, 1926-1933* (1966). Rosenbaum's conclusion, naturally, centered on the impact of diplomatic relations: Germany's "close relationship with Russia contained the tangible threat which forced the Western powers into one concession after another."¹⁹ Both Dyck and Rosenbaum painted Foreign Minister Gustav Stresemann and Ambassador to Russia Brockdorff-Rantzau as the architects of rapprochement with the Soviet Union, rather than Seeckt and the Reichswehr.

After the burst of scholarship from the mid-1950s to mid-1960s, interest in Soviet-German relations declined. It was not until 1973 that the German military archives

¹⁸As Stephanie Salzmänn noted, "This was the [British] Foreign Office's last word on the matter of German rearmament with Soviet assistance. Russo-German military co-operation was undesirable but unimportant." Stephanie Salzmänn, *Great Britain, Germany and the Soviet Union: Rapallo and After, 1922-1934* (Rochester, NY: Boydell Press, 2003), p. 144.

¹⁹ Kurt Rosenbaum, *Community of Fate: German-Soviet Diplomatic Relations, 1922-1928* (Syracuse, NY: Syracuse University Press, 1965), p. 281

were fully utilized in discussing Soviet-German military cooperation.²⁰ In that year, Francis L. Carsten published his masterpiece, *The Reichswehr and Politics, 1918 to 1933*.²¹ Carsten, offering an analysis of the German military interest in the German-Soviet relationship, concluded that

The close military understanding with Soviet Russia...enabled the Reichswehr to train officers and to develop weapons which were considered 'vital' to its interest. In Germany, too, secret measures of rearmament led to a slow 'expansion' of the Reichswehr.²²

Building on Carsten's work, three British historians released *German-Soviet Relations in the Weimar Era: Friendship from Necessity* in 1985. This work drew together, in a short volume, an excellent summation drawing from all available sources, including German military sources. It offered one chapter on military relations. Their conclusion argued even more forcefully for the importance of military cooperation. Looking back from 1939, they wrote that "such a degree of preparedness could only have been reached by covertly circumventing the military and economic restrictions imposed on Germany...within this context, the facilities developed for the use of the Reichswehr in the Soviet Union played a central role."²³ By that juncture, the scholarly consensus

²⁰ Besides the diplomatic and military histories of the Soviet-German relationship, important contributions have also been made on the subject by studies of the German or Soviet Army independently. Other examples that tangentially deal with the Soviet-German military relationship include works such as James Corum's *The Roots of Blitzkrieg: Hans von Seeckt and German Military Reform* (1992), Robert Citino's *The Path to Blitzkrieg: Doctrine and Training in the German Army, 1920-39* (1999), and Earl Ziemke's *The Red Army, 1918-1941: From Vanguard of World Revolution to America's Ally* (2004).

²¹ This remains one of – if not the – best book on the subject of the interwar German Army after half a century

²² F.L. Carsten, *The Reichswehr and Politics, 1918-1933* (Berkeley: University of California Press, 1966), p. 402.

²³ R.H. Haigh, D.S. Morris, A.R. Peters, *German-Soviet Relations in the Weimar Era: Friendship from Necessity* (Totowa, NJ: Barnes and Noble, 1985), p. 177.

clearly supported the contention that Soviet-German military cooperation was very significant, at least for the Reichswehr.

The fall of the Soviet Union made available for the first time a hitherto unknown wealth of documents from the Red Army regarding the period of cooperation. The first wave of publications used newly-published collections of Red Army documents, but not necessarily the Russian archives. Many of them were written by German scholars, such as Juergen Foerster's edited volume *Deutschland und das bolschewistische Russland von Brest-Litowsk bis 1941* [Germany and Bolshevik Russia from Brest-Litovsk to 1941] (1991) and Olaf Groehler's *Selbstmörderische Allianz: Deutsch-Russische Militarbeziehungen, 1920-1941* [Suicidal Alliance: German-Russian Military Relations, 1920-1941] (1992).²⁴ The best example of this is Manfred Zeidler's *Reichswehr und Rote Armee* [The Reichswehr and the Red Army] (1994), which was based on his dissertation. It remains the best analysis of the Soviet-German military relationship from the German perspective and one of the two most important books written on the subject.

Post-1991 histories of the interwar Red Army now invariably include material on the role of the Reichswehr in the Soviet Union. The definitive work on the interwar Soviet Army, John Erickson's monumental *The Soviet High Command: A Military-Political History, 1918-1941* (most recent edition 2001), offers sixty excellent pages on military cooperation, drawing mostly from German archival material. In his conclusion on the subject, John Erickson wrote: "The fulsomeness with which the Red Army

²⁴ I have not used this book much for two reasons. Groehler was an East German historian and the book seems to still bear some of the ideological marks of the Cold War. Secondly, Zeidler's later book is more comprehensive. That being said, I have referenced Groehler's work on poison gas development, *Der Lautlose Tod [The Silent Death]* (1978).

leadership acknowledged the extent of its debt to the Reichswehr for ‘decisive’ help suggests the question of how far this help had gone by 1933, and to what degree the Soviet military command had fallen under German influence.”²⁵ But he added that the availability of sources in Russia made it difficult fully to assess the role of cooperation for the Soviets: “Certain of the captured German documents make it possible to break the silence; the Soviet archives retain their secrets.”²⁶ This is not entirely the case. With the opening of the Soviet archives in 1991, vital new sources did in fact become available.

The first English-language work to utilize these new Russian archival sources was Alexander Nekrich’s posthumously translated and published notes, entitled *Pariahs, Partners and Predators: German Soviet Relations, 1922-1941* (completed in 1993, published 1997). He provided new details regarding military cooperation, although his focus was more broadly on diplomatic relations between the two states. While he used Russian archival sources, he relied heavily on a primary source collection, Yuri Dyakov and Tatiana Bushuyeva’s *The Red Army and the Wehrmacht* (1995).²⁷

The next major work drawing from the now-open Russian archives was Mary Habeck’s excellent *Storm of Steel: The Development of Armor Doctrine in Germany and the Soviet Union, 1919-1939* (1997). She discussed Soviet-German cooperation in the field of armored warfare in this work, but such focus was secondary to her interest in development of armored doctrine more broadly in each state. The references in her

²⁵ John Erickson, *The Soviet High Command: A Military-Political History, 1918-1941* (London: Frank Cass, 2001), p. 349.

²⁶ *Ibid*, p. 143.

²⁷ This collection is very useful; while this dissertation does cite it, it does not rely upon it as I have seen many of the same documents in the original either in the Russian State Military Archives or through the Yale Russian Archive Project.

sections on Kama are wide-ranging, drawing from a broad array of Russian and German language sources that had not previously been utilized on the subject. A similar work, focusing on naval cooperation, appeared in the form of Tobias Philbin's *The Lure of Neptune: German-Soviet Naval Cooperation and Ambitions, 1919-1941* (1994). It is heavily concentrated on the Molotov-Ribbentrop Pact, and largely depends on published primary source collections; nonetheless it is a valuable contribution.

But far and away the best book to utilize newly released Russian language archival material is the work of diplomatic scholar Sergei Gorlov's *Sovershenno Sekretno: Alianz Moskva-Berlin, 1920-1933* [Top Secret: Alliance Moscow-Berlin, 1920-1933] (2001). Its author had the benefit of extensive access to the Russian archives. As a researcher for the Russian Foreign Ministry, many of the documents he used were and are off-limits to foreign historians. The level of detail he offers on the military collaboration is the best available, rivalled only by Zeidler's book. His work also corrects a number of errors that derived from an over-reliance on German language material. However, Gorlov did not cite any German-language archival material in the work, relying instead of German-language secondary sources. Since so much of the German side had already been examined in the secondary literature, this was not a major weakness. Nonetheless, no work prior to the current study has utilized the full range of archival material in both Russia and Germany, an essential prerequisite for a comprehensive history of interwar Soviet-German collaboration.²⁸

²⁸ One other work worth noting is Canadian historian Vasilis Vourkoutiotis' *Making Common Cause: German-Soviet Secret Relations, 1919-22* (2007). This book is the best at using both German and Russian archival sources and tracks better than any work to date the origins of secret military cooperation. I have relied heavily upon this work in my early chapters. Besides using a unique mix of sources, this monograph

THE ARGUMENT

This dissertation argues that the period of military collaboration was decisive in the political, technological and organizational development of both the Reichswehr and Red Army in the interwar period. German instructors taught at the Red Army's major training facilities. Senior Soviet officers studied in Germany for extended periods, and rewrote military doctrine upon returning to the Soviet Union. German engineering firms broke new ground on technologies in conjunction with Soviet engineers. The Soviets acquired vast quantities of new weapons designs, some of it legally and some of it through espionage. At its core, the interwar exchange of Russian space for German technology was a wager upon which the fates of both nations during the Second World War depended. This work is not the first to make that case. Given the quantity of earlier publications, what new evidence can be offered in support of this thesis?

Nearly every monograph that has appeared so far has attempted to evaluate Soviet-German cooperation from an administrative angle. That is, the author provides a chronology of the negotiations, opening, organization and eventual closure of each of the four military facilities and the major military-industrial plants in the Soviet Union. With the exception of three works to appear in the 1990s – Zeidler, Gorlov, Habeck – every book on the subject treats the collaborative facilities themselves as a sort of “black box.” Typical, for instance, is the following summary of Soviet-German military facility at Lipetsk:

also skillfully brings the story to life, providing some remarkable anecdotes that I have not seen elsewhere. I was saddened to hear that Professor Vourkoutiotis passed away from brain cancer in 2015 at the age of 45. His scholarship was rich and innovative, and from all accounts he was also an excellent teacher.

Russo-German military cooperation reached its peak in the years between 1927 and 1932...the [British] air ministry had known, since 1929, that the Lipetsk flying school existed, that each year about 50 Reichswehr officers came for a two-year training programme on Junker and Albatros planes, and that the agreement between Moscow and Berlin for the use of the site had been renewed in April 1932 for another year.²⁹

Given that the primary goal of Soviet-German cooperation was to develop new technologies of war, to train new officers and engineers, and to expand their military industrial capacities, any attempt to estimate the impact of the secret military relationship between the two states that does not engage directly with the work conducted at the facilities is incomplete.

This dissertation analyzes three vital aspects of each jointly operated project: its role in training new officers, its impact on the formulation of new military doctrine, and its function in the development of new technology. In particular, there has been almost no exploration of the technological portion of military cooperation between the two future adversaries. Using blueprints, interviews and technical data to supplement other archival sources, this dissertation traces the evolution of a number of different technological systems developed during the period of Soviet-German cooperation.

To support that technological approach to the subject, this dissertation draws its framework from a number of sub-fields within the field of history, particularly the history of technology. Arnold Pacey's study of "technological dialogue" offers a particularly useful theoretical guideline. His *Technology in World Civilization: A Thousand-Year*

²⁹ Salzmänn, p. 144. I am not using Salzmänn's book as an example of this phenomenon, but rather her summation of British sources on the subject during the interwar period. Her work (again, with a diplomatic focus), does address some aspects of the military facilities.

History studies the interplay inherent in technology exchange. Using Pacey as a theoretical structure, I argue for convergence and dialogue between German and Soviet technology. In other words, selective borrowing and the process of being tested by a second set of scientists, engineers and officers led to more effective technologies than otherwise would have been created by either of the two sides acting alone. Cooperation meant more effective combat systems. A few brief examples highlight the exchange: Soviet submarines in World War II all had German designed engines; German tanks used chassis, turrets, cannons and radios all initially tested in the Soviet Union, some of them designed by Soviet engineers; and the first generation of Soviet heavy bombers, drawn up at a Soviet-German industrial plant, were so derivative of German designs that a German designer sued the Soviet government in international court for patent infringement. Generally, the Soviets received more technologically than did Germany. However, in some fields like armored warfare, Soviet vehicles were on par or ahead of German designs during the period of cooperation. The result of this selective borrowing and intensive technical testing by two different militaries was superior technology for each side.

This convergence also occurred between branches of the German military, and to a lesser degree, within the Red Army. In the United States, Great Britain and France, fights over funding and the quest for administrative independence hampered efforts to develop effective combined arms doctrine. But deep in Russia, with limited supplies and support, German aviators, chemical and biological weapons scientists, engineers, and officers all had to share resources. They frequently traveled to each other's facilities and

integrated their testing together. German pilots participated in air support experiments at both Kama (the tank testing grounds) and Tomka (the chemical weapons laboratory). German tank crews and engineers also traveled to Tomka to work on the development of a “chemical tank” capable of spraying chemical agents. While many of their attempted innovations did not succeed, others did: the use of air-cooled aviation engines in tank prototypes led to the adoption of Maybach 12 piston engines in German armored vehicles. The reason such convergence is important is that it reinforced the German operational doctrine developed in the early 1920s known as *Verbundenen Waffen* [Combined Arms]. The close coordination of armored vehicles, artillery, infantry and aircraft proved tremendously effective in the Second World War.³⁰ This doctrine evolved in part because of the nature of the German enterprises in Russia.

THE STRUCTURE

The opening chapter of this dissertation chronicles the process by which the two ideological adversaries first began to collaborate. Preliminary steps towards cooperation were taken even as the First World War continued. An important aspect of that story is the origins of the Reichswehr and Red Army from the ruins of the First World War armies in each state. The way in which the Reichswehr developed from the post-war Freikorps and the Red Army from the Russian Imperial Army had a major impact on the

³⁰ The Germans never perfected the technique, as the Russian campaign demonstrates. Infantry tended to lag far behind the fast-moving armored columns. By 1944 – particularly after the battles in the hedgerows in Normandy – the US had developed a more integrated system of tank-infantry-artillery-aircraft coordination. The US Army also, by that juncture, had superior communications equipment, particularly radios. See Mansoor, *The GI Offensive in Europe: The Triumph of American Infantry Divisions, 1941-1945* (Lawrence, KS: University of Kansas Press, 1999), p. 180.

evolution of cooperation. The first successful negotiations took place in the context of prisoner of war exchanges and a series of secret envoys sent from the Bolsheviks to Germany in 1919.

The second chapter offers an analysis of the first phase of Soviet-German military cooperation, which centered on a series of military-industrial projects. The most important of these was the Junkers Aviation Plant at Fili. Offered in detail is the story of the Junkers scandal that brought down a German government and damaged the Soviet Union's international reputation. This chapter also explores the process by which the Soviets acquired access to German military-industrial expertise and technology. It provides an assessment of the role of German firms in Soviet military industrial development before World War II.

The third chapter begins by chronicling one of the other military-industrial projects, the Bersol Plant in Volsk. This facility played a central role in the development of chemical weapons technology and infrastructure in the Soviet Union. The chapter then moves on to discuss two chemical weapons laboratories operated by the German and Soviet military in conjunction: Podosinki and Tomka. Tomka, in particular, played a major role in the doctrinal development of chemical weaponry in both militaries. Drawing from previously-uncited Russian sources, this chapter details the chemical weapons deployment technologies pioneered at Tomka. It concludes with a brief explanation of how Bersol, Podosinki and Tomka played a role in the non-use of chemical weapons by either the Soviets or Germans during World War II.

Joint Soviet-German armored warfare collaboration is addressed in chapter four. The central facility in that process was codenamed “Kama.” Hosting many of the top practitioners of armored warfare in both militaries, Kama also was home to a large delegation of Germany’s top engineers, including the designers of nearly all of Germany’s main tanks used in the Second World War. The Soviets tested many of their own designs and foreign purchases at Kama. Further, Mikhail Tukhachevsky, the Red Army’s top military theorist, borrowed crucial lessons from the experience of Kama in writing Soviet military doctrine. Drawing from interviews, unpublished memoirs and technical materials found in both German and Soviet archives, this chapter recreates the role Kama played in the future of armored warfare.

Chapter five analyzes the oldest and largest of the joint military bases, the aerodrome at Lipetsk. This facility, which began operation in 1924, played the central role in the rehabilitation of German air power, as hundreds of German pilots, mechanics and air power theorists learned to fly there. A large Soviet contingent also learned to fly on site, though Lipetsk’s role in training Soviet engineers and mechanics was of greater value. The base also served as a vital testing ground for new aircraft and aviation technology for both sides.

The least successful venue of cooperation – between the Soviet and German navies – is the subject of the final chapter. In addressing why naval cooperation failed to develop under the Weimar Republic but suddenly bloomed with Hitler’s ascension, this chapter contextualizes the joint work conducted at the other facilities. It also retells the surprising story of Soviet assistance to German commerce raiders and submarines in the

Atlantic and Pacific during the early phase of World War II, which went as far as providing Germany with a naval base on Soviet soil in 1939. This chapter concludes with a brief analysis of the role of military cooperation in the crafting of the second Soviet-German alliance from 1939 to 1941.

The interwar pact between Germany and the Soviet Union was little understood in its day, and even less so after the war. But it was the critical link in European diplomacy through 1941, emboldening two tyrants and paving the way for a renewal of war. Not unnaturally, the process by which Germany and the Soviet Union came to their covert alliance was veiled in secrecy and pursued only with great caution. The two pariah states would take their first steps towards cooperation in dramatic fashion during the summer of 1919.

CHAPTER ONE – FROM ENEMIES TO PARTNERS: THE REICHSWEHR AND
RED ARMY, 1917-1922

The spring of 1919 found German Major Fritz Tschunke serving as a liaison officer with the Lithuanian army in the then-capital city of Kowno. The Reichswehr had assigned him to assist in dismantling Germany's briefly-established empire in Eastern Europe. While sitting in his orderly room in mid-April, to his utter amazement, he witnessed a ghost walk through the door.¹ Under armed guard appeared Enver Pasha, the former Turkish Minister of Defense. Tschunke had been on the staff of General Hans von Seeckt when he had served in Turkey and recognized the architect of the Armenian genocide without hesitation. Tschunke quickly concluded that "the Lithuanians did not know the Turk's true identity."² He was right. The Pasha, who was carrying forged identity papers, had told his captors he was a Turkish Red Cross volunteer.³ Enver Pasha was on the Allied Power's list of war criminals, with a bounty on his head. Had the Lithuanians known, they would have immediately turned him over to British and French forces stationed elsewhere in Kowno.

¹ Enver Pasha had not died, of course, but he had disappeared and gone into hiding.

² Vasilis Vourkoutiotis, *Making Common Cause: German-Soviet Secret Relations, 1919-1922* (New York: Palgrave MacMillan, 2007), p. 44. This story is confirmed by Seeckt's correspondence. See Friedrich von Rabenau, *Hans von Seeckt: Aus Seinem Leben (1918-1936) [Hans von Seeckt: From His Life]*" (Hass und Koehler, Leipzig, 1940), p. 306.

³ Vourkoutiotis, p. 42.

When Tschunke managed to get a minute alone with the Pasha, he learned that the former minister had been traveling from Berlin to Moscow on a secret mission. His plane had developed mechanical problems and been forced to make an emergency landing in Lithuania. Then, to Tschunke's horror, the former minister of defense informed him that "important maps and documents from the German General Staff were in fact hidden in the airplane."⁴ Tschunke realized he had to act fast: if the Allies got hold of secret documents being transported from Germany to Bolshevik Russia – with whom they were at war – the consequences could be catastrophic.⁵ That night, Tschunke broke into the damaged airplane with the assistance of a German pilot in the employ of the Lithuanian Air Force, retrieving all of the sensitive materials inside.

Now he had to get the Pasha out of the country. Taking advantage of his position as liaison, he convinced the Lithuanian guards to give the "as yet unrecognized prisoner the right to go for successively longer walks, rather than being kept in a cell, while the investigation was going on."⁶ With careful planning, Tschunke arranged for these walks to go through fields on the edge of an air strip on the Alexota military base not far from the Pasha's holding cell. Next, Tschunke ordered his German pilot acquaintance and some accomplices to prepare an aircraft on the runway. At a designated date and time, they were to have the aircraft, engine on, taxiing on the runway.

When the prescribed hour arrived, a long walk led Enver Pasha and his guards to within sight of the airstrip. Suddenly, the 38-year old former minister took off at a dead

⁴ Vourkoutiotis, p. 42.

⁵ Tschunke first called his superior officer in Germany, Hans von Seeckt, to inform him of the situation.

⁶ Vourkoutiotis, p. 42.

run across a meadow towards the plane. Its engine roared to life as the guards opened fire on the escaping prisoner. Tschunke's team on the aircraft returned fire from the airfield as the Pasha sprinted to the aircraft and hopped in. Bullets continued to whiz towards the plane as it accelerated and lifted off. Airborne, it wheeled towards the southwest in the direction of Germany, safely away.

Thus ended the first ill-fated attempt to initiate direct communication between the German military and the Soviet Union. Enver Pasha had received encouragement from both German General Hans von Seeckt and Bolshevik revolutionary Karl Radek to journey to Moscow in the hopes of arranging a military alliance between Germany and Soviet Russia. But, traveling over a vast region riven by war, famine and disease, it would take two more attempts, another near capture and almost a year before Enver would successfully reach Moscow. When he did, he would play a role in the formation of Europe's defining interwar partnership.

Cooperation between the two states would evolve slowly and haphazardly between the end of the First World War and the signing of the Treaty of Rapallo in 1922. This latter agreement formalized the mutual understanding between the two states, serving as a foundation for the next decade of economic, political and military joint ventures. Even as diplomats for the German Weimar Republic and Bolshevik Soviet Russia announced mutual recognition at Rapallo, the German Reichswehr and Soviet Red Army had begun to moved towards their own understanding. A Soviet envoy, Viktor Kopp, quietly arrived in Berlin in 1919. The following year, the German Army established *Sondergruppe R* [Special Group R] to handle covert negotiations with the

Russian government.⁷ By the end of 1921, the German military had established a permanent covert office in Moscow, *Zentrale Moskau* [Moscow Center, or “Z”], which managed a growing network of Soviet-German military factories, research laboratories, testing grounds and training facilities. The journey from enemies in 1918 to allies in 1922 was a confusing one: both Soviet and German governments were divided on the issue of cooperation. To understand the process by which the two ideologically divergent regimes began to cooperate so quickly after having fought each other in the First World War, it is first necessary to examine the process by which their militaries were reestablished after the Bolshevik and German Revolutions.

THE DEATH OF THE IMPERIAL ARMY

By the time Imperial Russia had completed its mobilizations in 1914, it was the world’s largest military force. But it was a colossus of clay, dependent on a weak industrial sector and drawn largely from peasant classes growing increasingly hostile towards the state. The course of conduct in the field amply demonstrated the Russian Imperial Army’s weaknesses: poor leadership, training, doctrine and supply. Initially led by a series of staggeringly inept generals, the Imperial Army responded only slowly to changes in warfare thanks to paralysis at *Stavka* (the Army High Command).⁸ Looking

⁷ It was also known by the code-name Kupferberg-Gold in its first few years. This, as Sergei Gorlov points out, was a clever bit of wordplay. Kupferberg-Gold is a famous German variety of champagne. The German word for champagne is *Sekt*, which is pronounced identically to *Seeckt*. Sergey Alexeyvich Gorlov, *Sovershenno Sekretno: Alianz Moskva-Berlin, 1920-1933* [*Top Secret: Alliance Moscow-Berlin, 1920-1933*] (Moscow: Olma Press, 2001), p. 50.

⁸ The first phase of the war witnessed the disastrous defeat of Rennenkampf’s and Samsonov’s armies at Tannenberg and the Masurian Lakes. Simultaneously, however, the Russian Armies in Poland succeeded in pushing the Austro-Hungarian Army deep into Galicia, initially triggering panic in Berlin and Vienna. In

back from 1917, it was clear that the Imperial Russian state had failed to utilize effectively the country's vast human and natural resources. Russia called to arms the smallest percentage of its population of any of the combatants of the First World War, for two reasons: it could not supply more combatants, and it could not find enough officers to command a larger army. Addressing these two challenges were decisive to Imperial Russia's performance in the war, and as it turned out, the survival of the state.

The Russian Empire failed both tests. By the fall of 1914, Russia had 5.1 million men in arms, but only 4.5 million rifles for them. Only with tremendous efforts, by 1916 the state had overcome the worst of its industrial and organizational problems. But this had put a tremendous strain on the economic, political and social fabric of the country. Perhaps the decisive blow in the economic realm was self-inflicted: the state had decided to ban the sale of alcohol as a social measure in August 1914.⁹ With budget deficits skyrocketing to 40 percent in 1914, then 76 percent the following year, the decision to ban alcohol sales was devastating: vodka sales (a state monopoly) had contributed 26 percent of the national budget prior to the war.¹⁰ And faced with the sudden drying-up of

the summer of 1915, the German army shifted forces eastward and launched the Gorlice-Tarnow offensive in May 1915, which drove Russian forces entirely out of Russian Poland. 1916 witnessed a revival of Russian fortunes, thanks to improvement in supply and command. Under the formidable General Aleksei Brusilov, who took over the Southwestern Front in March 1916, the Russian Army handed the Austrians a serious defeat, driving fifty to sixty miles along a broad front and inflicting more than 1.3 million casualties. It was the last successful offensive action of the war as food shortages behind the lines and the declining morale at the front contributed to a rapid decline in military effectiveness. Norman Stone, *The Eastern Front, 1914-1917* (London: Hodder and Stoughton, 1975), pp. 85-91.

⁹ David Stone, *A Military History of Russia: From Ivan the Terrible to the War in Chechnya* (Westport, CT: Praeger Security International, 2006), p. 167.

¹⁰ Jennifer Siegel, *For Peace and Money: French and British Finance in the Service of Tsars and Commissars* (Oxford, UK: Oxford University Press, 2014), p. 128. Budget deficit figures are drawn from Stephen Broadberry, Mark Harrison, *The Economics of World War I* (Cambridge, UK: Cambridge University Press, 2005), p. 247.

capital liquidity with the outbreak of war, the Russian state had increasing difficulty borrowing to fund its war effort.¹¹ The structural weaknesses of Russian finance – its dependence on international loans and its chaotic tax system – made financing the war immensely difficult. When half-hearted financial reforms and heavy borrowing proved insufficient, it began relying more and more on printing money.¹² The Ministry of Finance temporarily abandoned the gold standard and began issuing new currency at an alarming rate, increasing outputs from 5 million to 20 million rubles a day in 1915, up to 50 million a day by 1917.¹³ Spiking inflation, which reached 702 percent of 1914 values by mid-1917, kept peasant farmers from bringing their products to market.¹⁴ The sudden food shortages that gripped the major cities, despite rapidly rising industrial output, wages and GDP, triggered the unrest of February 1917.¹⁵

To the second challenge – training and the officer corps – the strict class structure of Russian society proved a considerable handicap. In 1913, less than 1.5 percent of the national population was classified as “noble,” yet they constituted half of the Tsarist Army’s officer corps.¹⁶ In part for social reasons, the Tsarist Army had only 40,000

¹¹ Siegel, p. 130

¹² Ibid, p. 145.

¹³ Figures on inflation from the Russian State Archive of the Economy (RGAE), f. 7733, op. 1, d. 166, l. 11, cited by Steven G. Marks, “War Finance (Russian Empire),” in *1914-1918: International Encyclopedia of the First World War*, ed. by Ute Daniel, Peter Gatrell, Oliver Janz, Heather Jones, Jennifer Keene, Alan Kramer, and Bill Nasson, (Berlin: Freie Universität Berlin Digital Press, 2014), p. 10. <http://dx.doi.org/10.15463/ie1418.10159>

¹⁴ Norman Stone, *The Eastern Front, 1914-1917*, p. 287

¹⁵ The inflationary picture only grew worse after the February Revolution. One brief-serving provisional government finance minister wrote, “We have saved the situation only through the labor of the workers in the printing shop.” Cited in Siegel, p. 167. That course of action, was, of course, wildly unsustainable.

¹⁶ Steven Nafziger, Peter Lindert, “Russian Inequality on the Eve of Revolution,” Working paper March 13, 2011, Williams College, Economics Department Digital Collection, http://web.williams.edu/Economics/wp/Nafziger_Lindert_RussianInequality.pdf; Bryan D. Taylor, *Politics and the Russian Army: Civil-Military Relations, 1689–2000* (Cambridge, UK: Cambridge University, 2003), p. 58.

commissioned officers out of a force of 1.5 million in 1914 (2.6 percent). By comparison, there were 30,739 officers among 761,438 total soldiers (4.0 percent) in the German Army in the same year. The numbers were comparably skewed for non-commissioned officers.¹⁷ This shortage turned into a crisis as the war dragged on. The pre-war Russian officer corps disappeared in the fighting: more than 100,000 officers would become casualties during the war. Less than 10 percent of the pre-war officer corps was still serving in 1917.¹⁸ Increasing the size of the army required a massive change in the social demographics of the officer corps. Even when the willingness to do so existed, there simply were not enough educated men to meet the need. Huge shortages of NCOs and officers played a major role in the collapse of discipline in the ranks in late 1916 and early 1917.

The twin revolutions of 1917 were, more than anything else, a military revolt against the state.¹⁹ The first step came on February 25, when Tsar Nicholas II ordered troops to disperse huge protests of more than 200,000 striking workers in Petrograd.²⁰ The garrison of the city – numbering 180,000 men – was made up of a broad array of cavalry, infantry and technical support forces. The fate of the Empire hinged on the loyalty of these units, comprised largely of the recently conscripted or invalids, and short on both officers and weaponry.²¹ As social historian Allan Wildman noted, “If even a

¹⁷ David Stone, *A Military History of Russia*, pp. 166-167.

¹⁸ *Ibid*, p. 167.

¹⁹ Allan K. Wildman, *The End of the Russian Imperial Army, Volume I: The Old Army and the Soldiers' Revolt* (Princeton, NJ: Princeton University Press, 2014), p. 125.

²⁰ This essay uses the Russian Julian Calendar until 1918, when the Bolsheviks switched to the standard Gregorian calendar.

²¹ Wildman, p. 125, p 137. The author notes here that approximately one out of four infantry companies in the capital garrison were made up of recuperating wounded.

small fraction of the total available force could be depended upon to carry out the task of armed repression resolutely, the government would have no need to worry; but significant defections, or even passivity, within such units would spell disaster.”²² Two days later, gunfire from police and soldiers left more than a hundred demonstrators dead. This triggered a mutiny. NCOs from the Volynskii Regiment of the Life Guards – an elite formation that had seen extended combat against the Germans – announced to their officers they would not fire into the crowds.²³ After their commander tried to convince them otherwise, they shot him. Word spread and within hours, 60,000 men of the garrison had mutinied and thousands more deserted. On the morning of February 28, the commanding general of the garrison found he had only 2,000 men at his disposal, a number that dwindled to less than a thousand by noon.²⁴ And it was not just the enlisted and lower ranks that abandoned the autocracy: senior generals of *Stavka* refused orders from the Tsar that same day, finally precipitating his resignation.

On February 28, 1917, Menshevik revolutionaries announced the formation of the Petrograd Soviet of Workers’ and Soldiers’ Deputies. This body’s first act was the issuing of Order Number One on March 1. In seven brief commands, it decreed the effective end of military discipline, the establishment of soldiers’ councils, the election of representatives to the Petrograd Soviet and the elimination of old forms of address so

²² Wildman, p. 125, p 133; The government should have had a sense of the answer two days before the major mutinies broke out when, in an act laden with meaning, a Cossack cavalryman, refusing orders to suppress a swelling crowd of protesters, killed a policeman with his sword. This event was retold across the country and became one of the founding myths of the revolution.

²³ Wildman, p. 143.

²⁴ Ibid, p. 151; p. 158.

common to the Tsarist-era army, mostly based on ranks of nobility.²⁵ This act accelerated the disintegration of the frontline army, which acknowledged the Petrograd Soviet because it suited soldiers' prerogatives: ending the war and escaping the brutal military discipline which defined life in the Russian Army. This winning-over of the common infantryman and sailor proved decisive to the success of the Bolshevik Revolution nine months later.

RED OCTOBER AND THE RISE OF A NEW ARMY

Some five hours after darkness had fallen on a wet October evening in Petrograd, the boom and flash of gunfire sounded across the Neva River in the direction of the Winter Palace. This symbol of Tsarism was now the last refuge of the Russian Provisional Government in the Imperial Capital. The first shot – a blank – fired by the guns of the cruiser Aurora was soon followed by thirty rounds from ancient artillery pieces in the Peter and Paul Fortress across the river.²⁶ The previous day, Bolsheviks under orders from the Military Revolutionary Council (VRK) had seized the major centers of power throughout the Imperial capital; only the Winter Palace itself still resisted. For the last day and a half, the palace itself had been under a tight cordon managed by Bolshevik Vladimir Antonov-Ovseenko. At two in the morning, Leon Trotsky ordered the final assault, recalling the climactic moment in his later memoirs:

²⁵ John R. Boyd, "The Origins of Order No. I," *Soviet Studies*, Vol. 19, No. 3 (Jan., 1968), pp. 359-372, pp. 359-360.

²⁶ These were also fired by sailors taking orders from the Bolsheviks. Interestingly, the Peter and Paul fortress and prison built by Peter the Great had housed many of the Bolshevik leaders over the preceding decades, including Trotsky.

The palace ... was taken by storm. That part of the palace adjoining the Hermitage filled with the enemy. The junkers [military cadets] make an attempt to come at them from the rear. In the corridors phantasmagoric meetings and clashes take place. All are armed to the teeth. Lifted hands hold revolvers. Hand-grenades hang from belts. But nobody shoots and nobody throws a grenade. For they and their enemy are so mixed together that they cannot drag themselves apart....Workers, sailors, soldiers are pushing up from outside in chains and groups, flinging the junkers from the barricades, bursting through the court, stumbling into the junkers on the staircase, crowding them back, toppling them over, driving them upstairs. Another wave comes on behind. The square pours into the court. The court pours into the palace, and floods up and down stairways and through corridors....The junkers at the last guarded doors were disarmed. The victors burst into the room of the ministers... "I announce to you, members of the Provisional Government, that you are under arrest!" exclaimed Antonov in the name of the Military Revolutionary Council.²⁷

So ended the first military action of the Revolution. The image of a maddened mob overrunning the seat of national power was more propaganda than reality. So too was Trotsky's description of intense fighting in the old Palace: there had been almost no resistance. Instead, the conquest of the Winter Palace had been achieved with a two-day siege in which the Bolsheviks successfully deployed artillery, an array of deserting army units, workers formed into Red Guards formations, several armored car squads and the supporting fire of a naval detachment of five ships from the Baltic Fleet. It was the soldiers and sailors of Petrograd and Kronstadt, more than anything else, who triggered the October Revolution. The seizure of the Winter Palace was the most dramatic milestone in the transition of the Imperial Army to the Red Army of Soviet Russia.

The Bolshevik Party's success in the Revolution and Civil War was dependent less on the working class than upon the military. From the beginning of 1917 to 1920, the

²⁷ Leon Trotsky, *The History of the Russian Revolution*, translated by Max Eastman (London: Haymarket Books, 2008), pp. 814-815.

number of people identified by the Bolsheviks as “working class” dropped from 2.5 million (1.7 percent of the national population) to less than 1.2 million (0.8 percent).²⁸ By comparison, the Russian army mobilized more than 15 million soldiers, about half of whom were still in arms when the October Revolution occurred. By and large, they lent their support to the Bolsheviks. Two figures make this eminently clear. First, in the Constituent Assembly elections held in January 1918, the Bolsheviks won less than a quarter of the national vote, but carried 62 percent of the Baltic Fleet, 56 percent of the Northern Front and 67 percent of the Western Front, the largest naval and two largest land forces in the Russian Army.²⁹ Second, more than 70 percent of all volunteers joining the Red Army in 1918 were former soldiers in the Imperial Army.³⁰ The early Bolshevik regime was one of sailors, soldiers and professional revolutionaries.

The Bolsheviks at first did not bother to create a new military structure, believing in the inevitability of world revolution. In fact, they continued to dismantle the old: on January 29, 1918, 33-year old ensign Nikolai Krylenko, who had been appointed Supreme Commander of the Military, announced the demobilization of the entire army.³¹

²⁸ “The Working Class of the USSR,” in *The Great Soviet Encyclopedia*, 3rd Edition, 1979 (Digital Publication: The Gale Group, Inc.). Of course, a factor in the Revolution itself had been the explosive growth of the working and urban classes during the war: between 1914 and 1916, the number of industrial laborers increased by over a million people. Norman Stone, *The Eastern Front, 1914-1917*, p. 284. As has been argued by Stone and others, Russia experienced phenomenal but extremely uneven growth from 1914 to 1917; it was this uneven increase in standards of living and productivity which drove unrest, rather than poverty or declining standards of living. Stone offers some excellent statistics in support of that contention.

²⁹ Oliver Henry Radkey, *The Election to the Russian Constituent Assembly of 1917* (Cambridge, MA: Harvard University Press, 1950) p. 80.

³⁰ Orlando Figes, “The Red Army and Mass Mobilization during the Russian Civil War 1918-1920,” *Past & Present*, No. 129 (Nov., 1990), pp. 168-211, p. 175. In fact, the Bolsheviks had great difficulty drawing any troops from the working class, due to their small numbers – in February 1918, when the first major recruiting drive began, only 26,000 workers “volunteered” in Moscow and St. Petersburg, and even many of those were reluctant. Given that the Tsarist Army primarily recruited among peasants, the figure of 70 percent is surprisingly high.

³¹ Evan Mawdsley, *The Russian Civil War* (New York: Pegasus Books, 2005), p. 34

In theory this measure was offset by a declaration on the previous day founding the *Raboche-Krestyanskaya Krasnaya Armia* [The Workers' and Peasants' Red Army, or RKKKA]. Still, hopes for the outbreak of revolution across Europe limited efforts at large-scale military preparations. Around 50,000 soldiers remained in "screens" facing the German Army along the cease-fire line.³² The winter of 1917-1918, after the October Revolution, saw relative stability on the front between Russia and the Central Powers. Armistice negotiations began in December 1917, but they soon fell apart because of Bolshevik intransigence. It was only when peace negotiations collapsed with Germany in February 1918 and the *Deutsches Heer* began moving eastwards with such rapidity that it became clear to Lenin and his inner circle that a large, well organized military force was needed.³³

FROM WAR TO THE PEACE OF BREST-LITOVSK

In February 1918, Trotsky announced the Soviets would not resume peace negotiations with Germans. Instead, the Bolshevik Central Committee proposed a "no war, no peace" policy, whereby they simply ignored the Central Powers.³⁴ They did so for three primary reasons: they hoped for the dissolution of German forces arrayed against them and the outbreak of revolution in Germany; they did not want to make the tremendous concessions necessary for peace; and they did not want to interact

³² Mawdsley, p. 67.

³³ Leon Trotsky, "Introduction," May 21, 1922, in *The Military Writings and Speeches of Leon Trotsky, Volume 1: 1918*, Translated and Annotated by Brian Pearce (London: New Park Publications, 1979), p. 4.

³⁴ Ronald Grigor Suny, *The Soviet Experiment: Russia, the USSR, and the Successor States*, (Oxford: Oxford University Press, 1998), p. 67.

diplomatically with a capitalist state.³⁵ Germany's Operation *Faustschlag* (Fist Strike), launched in February 1918, shattered these hopes. The rapid advance of German forces towards Petrograd led to the Treaty of Brest-Litovsk, signed on March 3, 1918.³⁶

The terms of the treaty, drawn up by the German High Command, were extremely onerous: Russia renounced control over the Baltic States, Finland and Belarus, or about 25 percent of Imperial Russia's population and industry. The acceptance of such terms helped to spark Russian national resistance to the Bolsheviks, inaugurating the Russian Civil War. The Treaty of Brest-Litovsk was the first formal diplomatic interaction between the Bolsheviks and a capitalist state, a fact which would prove of importance.³⁷ The Allied states' hostile reaction to this separate peace – namely, military intervention in the Russian Civil War – meant that there could be no trade between the new Russian state and the Entente. Since relations had been established, however tenuously, with Berlin, the Bolsheviks turned first to Germany for desperately needed industrial goods, especially locomotives and rolling stock.³⁸ The first Soviet trade delegation, led by Adolf Joffe, would arrive in Berlin almost immediately after the signing of the Treaty of Brest

³⁵ For more details on the course of negotiations, see *Proceedings of the Brest-Litovsk Peace Conference: The Peace Negotiations between Russia and the Central Powers, 21 November, 1917- 3 March, 1918* (Washington DC: Government Printing Office, 1918).

³⁶ The process was contentious – Trotsky's negotiating policy involved constant delays, stalling attempts, and even efforts to convince German bodyguards and drivers to declare for the revolution. Hindenburg wrote of the bizarre process that "Lenin and Trotsky behaved more like the victors than the vanquished, while trying to sow the seeds of political dissolution in the rear as well as the ranks of our army." Paul Von Hindenburg, *Out of My Life* (1920, Reprint; London: Forgotten Books, 2013) pp. 334-5. For the best treatment of this peace, see John Wheeler-Bennett, *Brest-Litovsk: The Forgotten Peace* (London: MacMillan and Co., 1967), pp. 477.

³⁷ Robert M. Slusser, Jan F. Triska, *A Calendar of Soviet Treaties, 1917-1957* (Stanford, CA: Stanford University Press, 1957), pp. 1-3.

³⁸ Anthony Heywood, *Modernizing Lenin's Russia: Economic Reconstruction, Foreign Trade and the Railways* (Cambridge: Cambridge University Press, 1999), 76.

Litovsk.³⁹ In exchange, the German High Command dispatched Count Wilhelm von Mirbach to serve as the German ambassador in Moscow. This initial interaction proved disastrous: Mirbach was assassinated by Leftist SRs during the July uprising and Joffe was deported from Germany in late 1918 for trying to start a revolution.

While the war raged on the Western Front, another Soviet delegate, Leonid Krasin, arrived quietly in Germany in the summer of 1918 and met with General Ludendorff. Their objective was to organize the Supplementary Clauses to the Treaty of Brest Litovsk.⁴⁰ Signed in August 1918, this agreement was designed to reflect the changing fortunes on the Western Front. As German strength waned, its High Command sought to ease some of the particularly odious clauses of Brest-Litovsk in the hopes that Russia might serve in some function as an ally. Germany agreed to “evacuate white Russia and occupy no more Soviet territory” in exchange for six billion marks to be paid as reparation for German property seized at the beginning of the war.⁴¹ In addition, the treaty contained crucial commercial provisions designed to ease the economic isolation of both states. It also included a clause whereby “Germany pledged to offer its own and Finnish troops to help combat Allied intervention troops from Northern Russia and Baku.”⁴² But German defeat was only two months away. Neither the economic nor

³⁹ R.H. Haigh, D.S. Morris, A.R. Peters, *German-Soviet Relations in the Weimar Era* (Totowa, NJ: Barnes and Noble Books, 1985), p. 28. Joffe would be deported on November 8, 1918 for trying to overthrow the German government before the First World War ended.

⁴⁰ *The Treaty of Brest-Litovsk*, The Avalon Project: Documents in Law, History, and Diplomacy, Yale University, http://avalon.law.yale.edu/20th_century/bl34.asp#treatytext

⁴¹ Haigh, Morris, Peters, p. 29. The Germans also required the Bolsheviks to sell a certain percentage of Russia’s oil to them.

⁴² Vourkoutiotis, p. 14. The Soviets were made more amenable to the terms by the Allied intervention in the Russian Civil War, which began with the landing of British Marines in the port of Murmansk in late June 1918.

military hopes envisioned by this early step towards cooperation would have any impact on the outcome of the First World War. Nonetheless, the supplement to the Treaty of Brest-Litovsk first marked the possibility of strategic cooperation between the German military and the Soviet state.

THE BIRTH OF THE RED ARMY

On March 13, 1918, shortly after the conclusion of the Treaty of Brest Litovsk, Leon Trotsky became the first People's Commissar of Military Affairs. He had been lackadaisical about his earlier appointment as Commissar of Foreign Affairs, suggesting that he would "print a few pamphlets and close up shop."⁴³ But he approached his new role with deadly earnestness and surprising pragmatism. Clarifying his objectives in a speech delivered to a session of the Moscow Soviet of Workers', Soldiers' and Peasants' deputies six days later, he argued that "in order to ensure the security of the Soviet Republic under conditions of international counter-revolutionary encirclement, such units [as we possess] are already inadequate. We need a properly and freshly organized army!"⁴⁴ There were two competing options available to Trotsky in March 1918. First, he could follow what was considered to be the orthodox Marxist line and raise large numbers of "people's militias" of the politically conscious. As he wrote in 1922, the oppositionist "Left" argued that "the Revolution must, in conformity with its whole nature, give up for good and all not only positional warfare, but also the centralized

⁴³ Robert Service, *A History of Modern Russia, From Nicholas II to Putin* (London: Penguin Publishing, 2003), p. 67.

⁴⁴ Leon Trotsky, "We Need an Army," March 19, 1918 in *The Military Writings and Speeches of Leon Trotsky, Volume 1: 1918*, p. 23.

army.”⁴⁵ This attitude came with immense dangers in the realm of military effectiveness.⁴⁶ Instead, Trotsky decided to recreate a professional standing army, albeit one that would be comprised primarily of workers and peasants.

With that decision made, the Bolsheviks found themselves in an odd position: they had done everything they could to destroy the Imperial Army, but now that they were in a position of power, they needed to reconstitute it. First, this meant drawing professional officers from the old army into the new. Trotsky would write, looking back from 1922, that

When we took our first constructive steps, the question of these former officers of the Tsarist army came up in an acute form. We needed them as representatives of their craft, as men who were familiar with military routine, and without whom we should have to start from scratch. We could not build a centralized military apparatus, and an army to correspond, without drawing into the work many representatives of the old officer corps.⁴⁷

The recruitment process proved easier than expected: Petrograd and Moscow received a steady influx of former Imperial Army soldiers and officers offering their services to the new regime.⁴⁸

Why were these Imperial officers so willing to serve their ideological opponents? One described his attitude during a conversation with General Bonch-Bruevich: “I am far from this socialism that your Bolsheviks preach. But I am ready to work honorably not

⁴⁵ Trotsky, “Introduction,” in *The Military Writings and Speeches of Leon Trotsky*, p. 10.

⁴⁶ Indeed, it ran counter to the Bolsheviks’ own construction of their party, which emphasized the “vanguard” of the working class in the form of a small, disciplined band of professional revolutionaries.

⁴⁷ Trotsky, “Introduction,” in *The Military Writings and Speeches of Leon Trotsky*, p. 10.

⁴⁸ David Stone, *A Military History of Russia*, p. 178; Erickson, p. 26. One of these would serve in a very prominent role: General Bonch-Bruevich had become the Bolshevik’s top military adviser, largely because his brother, an old Bolshevik, was one of Lenin’s secretaries. Bonch-Bruevich recruited heavily from the ranks of the former general staff, drawing in talented senior officers for whom his presence in a senior position of power was reassuring.

only with them, but with anyone, even the Devil and his disciples, if only to save Russia from German slavery.”⁴⁹ Russia came first in their eyes, regardless of who ruled. In the first few months of 1918, these volunteers numbered 8,000; by 1918, more than 22,000 had joined.⁵⁰ By the end of the war, more than 48,409 former officers and 214,717 former NCOs would serve in the ranks of the RKKA.⁵¹

Trotsky faced massive opposition from within the party on the question of the “military specialists,” as former Imperial Officers would delicately be called. It was a debate that would continue to rankle the RKKA throughout the Civil War. On more than a few occasions, Red Army soldiers would execute their hated officers. In an effort to placate the leftist oppositionists, as well as prevent defections or sabotage, Trotsky arranged for the creation of a political commissar system:

The Soviets... will dispatch into all military organs and units reliable political commissars who will exercise overall control...the military specialists will be in charge of the technical side, of purely military matters, operational work and combat activities, while the political side of the organization, training and education of the units must be wholly subject to the plenipotentiary representatives of the Soviet regime, its commissars.⁵²

The commissar system, first organized on April 8, 1918 suffered from a lack of qualified candidates. But by January 1919, there were political sections functioning down to the division level, and in many cases below it.⁵³

⁴⁹ Cited in Mawdsley, p. 61. This attitude, common throughout 1918, presupposed that war with Germany would resume at an opportune time, something that seemed possible until the November 11 Armistice.

⁵⁰ Mawdsley, p. 60.

⁵¹ Erickson, p. 33. Trotsky considered the NCOs to be as politically reliable as the Imperial officer corps, noting that “They were, predominantly, the literate sons of peasant families of the Kulak type.” Trotsky, “Introduction,” p. 12.

⁵² Trotsky, “We Need an Army,” March 19, 1918 in *The Military Writings and Speeches of Leon Trotsky, Volume 1: 1918*, p. 23-24.

⁵³ Erickson, p. 36.

Besides the creation of the commissar system, Trotsky had two other arguments which he effectively used to win the debate over the “military specialists.” First, he pointed out that under plans presented in April and May for an 88 division army, the RKKA would require 55,000 officers. Red Army officer training programs were proceeding at a snails’ pace due to the lack of qualified instructors: they would turn out only 1,753 officers in 1918.⁵⁴ Second, large numbers of Imperial Army officers, particularly junior ones, had risen from the ranks during the course of the war. The vast majority were not members of the nobility. Thanks to his efforts, the “military specialist” policy, debated throughout the spring of 1918, became official state policy with the approval of *Sovnarkom* (The Council of People’s Commissars, responsible for “affairs of the state”) on July 29, 1918.⁵⁵ It would have a decisive effect, preventing tens of thousands of officers from joining the Whites and providing the Red Army with the core of its leadership for the length of the civil war: 314,180 of the 446,729 (70.3 percent) officers who served in the Red Army during the war were former Imperial Army members.⁵⁶

With these questions settled, Trotsky began to address other major deficits within the still-forming RKKA. The two biggest were the twin problems of administration and discipline. In March 1918, the Red Army’s “apparatus was extraordinarily unwieldy... We made use of every breathing space to tighten, simplify and refine our military

⁵⁴ Erickson, p. 33.

⁵⁵ *Ibid*, p. 33.

⁵⁶ *Ibid*, p. 34.

organization.”⁵⁷ This “tightening” process began as soon as Trotsky entered office. He immediately eliminated the committee which had governed defense policy before March 1918. Instead, he concentrated power with the Supreme Military Soviet, which had been formed on March 4, 1918 and was reorganized by Trotsky a few weeks later.⁵⁸ Based in Petrograd, it included a Commissar for War, a Commissar for the Navy, as well as three “specialists,” or former Imperial Army officers who offered their expert advice to Trotsky. He, along with the Sovnarkom, would make the final decisions.

The discipline question was particularly problematic. With Order Number One, the Bolsheviks had eliminated the ability of officers to effectively command their men; with the establishment of officer elections, they had effectively destroyed the centralization of the army. Now both measures needed to be repealed. Trotsky defended this problematic reassertion of officers’ power by arguing that

when the people realize that discipline is being reintroducedin order to consolidate and defend all the conquests made by the revolution, they will approve even the strictest of measures aimed at the establishment of discipline. We must at all costs and at any price implant discipline in the Red Army.⁵⁹

Discipline had deteriorated considerably in the aftermath of the demobilization orders of 1918. The elimination of epaulettes, officer ranks and appointed officers were reversed beginning in March 1918, with the introduction of a new badge system, functional titles like *KomDiv* (division commander) instead of the old rank system, and the appointment of officers from Moscow. But in combat units, officers accused of “restoring the

⁵⁷ Leon Trotsky, “Introduction,” May 21, 1922, in *The Military Writings and Speeches of Leon Trotsky, Volume 1: 1918*, p. 15.

⁵⁸ Erickson, p. 26.

⁵⁹ Leon Trotsky, “We Need an Army,” March 19, 1918 in *The Military Writings and Speeches of Leon Trotsky, Volume 1: 1918*, p. 24.

disciplinarianism of the old imperial army” often faced physical violence or death at the hands of their soldiers.⁶⁰

It was only with the increasingly harsh reintroduction of corporal punishment that the RKKA began to show signs of military effectiveness. Within months of Trotsky’s reorganizations, officers were allowed to punish disobedient soldiers by hitting them in the teeth with the butt of a rifle.⁶¹ Other orders appeared throughout the army ordering any soldier caught drinking alcohol to be shot. But the most infamous reassertion of discipline came with Trotsky’s order in November 1918 that all soldiers caught deserting would be shot on the spot. The origin of this harsh decree was the desertion epidemic; from June 1919 to June 1920, “the Red Army was losing through desertion as many men as it was successfully recruiting.”⁶² Threats of imprisonment or even punishment against the families of deserters had little effect, as soldiers would happily submit to imprisonment to avoid combat and the number of deserters made punishments against families impractical. Like his provisions on leadership and the structure of the RKKA, Trotsky’s provisions on discipline were deeply unpopular among many soldiers, but fundamentally necessary. And, as it turned out, essential to winning the Russian Civil War.

⁶⁰ Figes, “The Red Army and Mass Mobilization during the Russian Civil War 1918-1920,” p. 197.

⁶¹ Ibid, p. 196.

⁶² Ibid, p. 199.

THE END OF IMPERIAL GERMANY

While Trotsky forged the Red Army in the first full year of the Russian Civil War, November 1918 found Germany on the edge of a precipice. As the guns fell silent across the trenches to the west, the army within Germany began to disintegrate. In Berlin,

Disorder, insecurity, plundering wild commandeering and house-prowling had become the order of the day... the troops went their own way, the barracks were like so many bedlams. ... the only masters of Berlin were Disunity, Licentiousness and Chaos... Day and night, senseless shooting – partly from exuberation, partly from fear. Berlin lived, danced, drank and celebrated.⁶³

But this relatively peaceful anarchy was not to last long. Soon, months of bloodletting engulfed Germany's largest cities as communist revolutionaries squared off against army veterans who backed the new Republic – or at least hated the specter of communism more than the new socialist regime. At the frenzied height of the violence in March, armed communists brutally murdered policemen, government officials and soldiers, triggering a state of siege in the capital. They then fortified the captured national police headquarters. It took government forces a full day and the use of “a squadron of bombing planes, trench mortars, howitzers, and heavy machine guns” and finally, an infantry assault to dislodge the rebels.⁶⁴ The violence would drag on for another two months, as one by one the citadels of the revolution fell to volunteer units of veterans. For Red Army commanders reading in horror about the collapse of the German Revolution that spring, it must have been impossible to imagine that the men shooting down revolutionaries in the streets of Berlin in the winter of 1918-1919 would be their future allies. The thought must

⁶³ Robert G.L. Waite, *Vanguard of Nazism: The Free Corps Movement in Postwar Germany 1918-1923* (New York: W.W. Norton Company, 1952), p. 3.

⁶⁴ *Ibid*, p. 71.

have been equally bizarre to the German officers who fought communist Spartacists without mercy in Munich, the Ruhr and Red Saxony that spring. But the future path of the German Army would lead through Russia.

The First World War changed the traditional stance of the German Army above politics. The military assumed many of the central functions of the state under the military dictatorship of Generals Paul von Hindenburg and his Quartermaster General Erich Ludendorff.⁶⁵ In that role, Ludendorff informed Kaiser Wilhelm II that the war was lost on September 30.⁶⁶ A liberal chancellor, Prince Maximilian of Baden, replaced Georg Hertling, specifically empowered to negotiate an armistice using the United States as the intermediary.⁶⁷ When American communiques made it clear that the Kaiser must step down and the German Army withdraw to Germany's pre-war borders as a precondition of peace, Ludendorff was forced to resign. He would be replaced by Wilhelm Groener, a non-Prussian and politically pragmatic General Staff Officer.⁶⁸

As Groener assumed his new office on October 23, the German Army was falling apart. Three weeks earlier, the Allies had breached the Hindenburg line.⁶⁹ On November

⁶⁵ Carsten, p. 4.

⁶⁶ It was the collapse of Bulgaria which finally convinced the German High Command that the war was unwinnable.

⁶⁷ This process began with a cable sent on October 5, 1918. Ludendorff hoped to use the United States as an intermediary in order to secure more lenient terms; the nature of Wilson's Fourteen Points and a recent speech had convinced him that Wilson would be an advocate for a mild peace.

⁶⁸ He had managed railway logistics and the German food supply through 1916. Groener had shown remarkable organizational abilities, leading to his promotion by November 1916 to lieutenant general. In that position, he and Erich Ludendorff attempted to establish military control of the German war economy. His views on the war and the economy – generally to the left of Ludendorff – would get him in trouble, leading to a front line command. From March to October 1918, Groener would command the German occupation of Ukraine before being recalled to take Ludendorff's place. See Wilhelm Groener, *Lebenserinnerungen: Jugend, Generalstab, Weltkrieg [Memoirs: Youth, General Staff, World War]* (Göttingen: Vandenhoeck & Ruprecht, 1957).

⁶⁹ Among the other intervening disasters: in Italy, on October 24, the Allies launched the massive *Vittorio Veneto* offensive, netting more than 400,000 prisoners in a week.

3, the German High Seas Fleet in Kiel mutinied; within 24 hours, more than 40,000 soldiers and sailors had taken up arms against their own government. On October 28, the Reichstag declared that it had the power to dismiss the cabinet and chancellor. The “October Constitution” was reinforced as soldiers’, sailors’ and workers’ committees seized power in major German cities, leading to the abdication of all of Germany’s surviving royal houses. Even the military deferred to the new civilian government, passing responsibility for the armistice to secretary of state Matthias Erzberger. In the words of General Wilhelm Groener, this was done to “keep the armor shining.”⁷⁰ By abjuring responsibility for defeat and the treaty to come, the military would remain the most popular institution in post-war Germany, an intentional calculation by Hindenburg and Groener.⁷¹

Still, Wilhelm II dithered about the possibility of retaining his crown, at least in Prussia. It was not until November 9, when General Groener finally lost his patience:

I declared more sharply than I might have done otherwise what I considered my duty to say: ‘the army will march home in peace and order under its leaders and commanding generals, but not under the command of Your Majesty, for it stands no longer behind Your Majesty.’⁷²

When Hindenburg reluctantly seconded Groener’s statement, the Kaiser abdicated and went into exile. Just as in Russia a year earlier, it was only when the inner circle of military leadership refused to stand by the imperial government that it finally fell.

⁷⁰ Carsten, p. 6.

⁷¹ Ibid, p. 6. This would also be supported by the infamous *Dolchstoß* [stab in the back] myth of civilian betrayal at the war’s end.

⁷² Groener, *Lebenserinnerungen*, p. 466. Quoted in Carsten, p. 6.

THE GERMAN REVOLUTION, 1918-1919

The German Revolution had just begun; the state was now leaderless. Three pillars of authority remained in Germany: the military led by Hindenburg and Groener; the Reichstag, where the *Sozialdemokratische Partei Deutschlands* (SPD) championed a moderate socialist republic led by Friedrich Ebert; and the mushrooming councils of radical soldiers, sailors and workers that were seizing authority across the country.

The SPD's leadership and membership had grown increasingly middle-class and constitutionally inclined after its schism with its anti-war wing, the *Unabhängige Sozialdemokratische Partei Deutschlands* (USPD), in 1914. Within hours of the announcement of the Kaiser's abdication on November 9, Ebert and the SPD leadership officially ended the monarchy by declaring Germany a Republic and Ebert as chancellor. Meanwhile, the USPD's leadership had planned to launch a violent revolution on November 11. Surprised by speed of events, they now attempted to form a separate government of workers' councils in Berlin. It seemed that events might follow the course of the February Revolution in Russia.

Ebert and the SPD feared the USPD and the potential for violent revolution more than they distrusted the military. On the night of November 9, General Groener called the *Reichskanzlei* where Ebert had taken up residence. As he recalled

In the evening, I 'phoned the Reichskanzlei and told Ebert that the army put itself at the disposal of his government, that in return for this the Field-Marshal [Hindenburg] and the officer corps expected the support of the government in the maintenance of order and discipline in the army. The officer corps expected the government to fight against Bolshevism and was ready for the struggle. Ebert accepted my offer of an alliance.⁷³

⁷³ Groener, *Lebenserinnerungen*, p. 467. Quoted in Carsten, p. 11.

This was the decisive moment in the troubled birth of the Weimar Republic: an alliance of the democratic left and the monarchist officer corps against the revolutionary left.⁷⁴

The following day (November 10) the SPD joined a coalition “government” called the Council of People’s Representatives comprised of six socialists in Berlin. The three SPD and three USPD members ruled in unison, “elected” by meetings of workers and soldiers in the capital.⁷⁵ This new government agreed to the armistice terms demanded by the Allies, which would go into effect the next day. But there were still several major challenges to be confronted before the Republic could be truly established. First, it remained to be seen if the army would completely disintegrate, as the Russian Army had. If so, then Ebert’s government would collapse. Second, the revolutionaries themselves needed to be either coopted or conquered before the new regime would be able to govern. And finally, the new government needed to legitimize itself through the holding of – and winning – of national elections.

After the armistice, the German General Staff faced disintegrating discipline, soldiers’ councils and mass desertions. On November 17, Groener wrote to his wife, “How sad things appear in our Fatherland! This collapse [of the army] is a much larger misfortune than the whole war.”⁷⁶ The first step in reasserting control was to peacefully and in good order withdraw the defeated field army in the west back onto German soil. By and large, that force had proved more or less resistant to revolutionary stirrings. It

⁷⁴ The military itself was disintegrating at this stage, so at first, this promise offered little to the government. But soon, the officer corps would prove its usefulness.

⁷⁵ Carsten, p. 10.

⁷⁶ Groener, *Lebenserinnerungen*, p. 471.

marched to the east bank of the Rhine as per the armistice agreement “under its old flags and its old officers.”⁷⁷ There would be no mutiny in the west. But among the forces stationed within Germany, and those still occupying the east, the problem of collapse remained a real threat. The *Ostheer* [Army in the East] had been stripped of its best soldiers for the spring and summer offensives; there were almost no soldiers under the age of 35 left on the Eastern Front, and more than 14 percent of all soldiers there were draftees from Alsace-Lorraine, considered to be unreliable at best.⁷⁸ On top of this, since the signing of the Treaty of Brest Litovsk, there had been widespread fraternization with Bolshevik propagandists.

To counter the burgeoning soldiers’ councils, on November 10, Hindenburg announced a policy of *vertrauensräte* [trusted councils].⁷⁹ Officers down to the company level were to select the most reliable men, who would present grievances and be able to air their social and economic concerns with their officers.⁸⁰ Generally, each council included one officer, one NCO and two enlisted men. In exchange for their newfound powers, they were expected to maintain discipline. This measure played a major role in preventing the dissolution of units in the east. But the army’s success in maintaining discipline through the withdrawal from the front was thrown away through incompetence over the next few weeks. Although the General Staff succeeded in bringing millions of

⁷⁷ Carsten, p. 10.

⁷⁸ Donald Stephenson, *Frontschweine and Revolution: The Role of Front-Line Soldiers in the German Revolution of 1918* (Unpublished Doctoral Dissertation, University of Kansas, 1986), p. 47.

⁷⁹ *Ibid.*, p. 159.

⁸⁰ *Ibid.*

soldiers back into garrison in Germany, it failed to establish a system for discharging them:

no adequate machinery for demobilization had been constructed, and the mighty Imperial army simply fell apart. Battle-tough veterans wandered aimlessly and noisily through the streets of German cities and thousands of them forgot their hunger and found warmth and new excitement in Communist meetings and demonstrations.⁸¹

By January, much of the army had melted away, often still in the possession of weapons.⁸² Out of the 10 million rifles and tens of thousands of machine guns in circulation at the end of the war, only 1.3 million rifles and 9,000 machine guns were surrendered to the Allies in 1918 and 1919.⁸³ Armed and organized, common soldiers and sailors had tremendous influence in deciding the post-war political landscape of Germany.⁸⁴

Kiel and the navy remained a particularly thorny threat to the stability of the state. In early November, Prince Max von Baden had dispatched a senior member of the SPD, Gustav Noske, to Kiel, where his assignment was to find a way to manage the growing

⁸¹ Waite, p. 58.

⁸² Barton Whaley, *Covert German Rearmament, 1919-1939: Deception and Misperception* (Frederick, MD: University Publications of America), p. 7.

⁸³ Whaley, pp. 7-8. The Weimar Republic also issued a ban on firearms, trying to deescalate the violence that had begun in 1918. And Allied efforts at weapons collection did improve somewhat. On July 7, 1920, Seeckt reported to the Allies at the Spa Conference that the Inter-Allied Commissions of Control (IACC) had taken (and begun destroying) more than 2.4 million rifles, 65,800 machine guns, 12,700 mortars and 22,900 pieces of artillery. Combined with military equipment surrendered as part of the Armistice, the IACC stripped the German military of more than 93 percent of the war materiel it had possessed in November, 1918. However, this process took nearly two years to complete, during which time the country was awash in firearms. Hans von Seeckt, "General Von Seeckt's Statement on German Disarmament at the Spa Conference," 7 July, 1920, The Cabinet Papers (CAB) 24/108, 94, The British National Archives (BNA), pp. 1-6. These figures include weapons confiscated by the German police and the Reichstreuhandgesellschaft and either destroyed or turned over to the IACC for destruction.

chaos triggered by the naval mutiny. Noske was a working-class craftsman who had become a journalist, and later an SPD representative. Considered the SPD's expert on military affairs, Noske was perhaps the most conservative member of the SPD's ruling clique. When he arrived in Kiel in early November, he was surprised by his reception:

The people had heard of my coming.... in front of the station the square was packed with armed sailors. A moment later, I was sitting in an automobile with five or six other men. Standing upright [in the car] a man brandished a red flag and shouted again with high voice, "Long live freedom!" Next to me sat a soldier...who told me briefly that during the day the officers had proven absolutely powerless in the face of thousands of armed naval sailors.⁸⁵

Little did they know that Noske was in "implacable opposition to anarchy and disorder."⁸⁶ While carefully maintaining his popularity with the mutinying sailors, he succeeded in slowly reimposing military discipline and officers' control, using force when it briefly became necessary. Kiel was rapidly subdued.⁸⁷

Back in Berlin, the SPD's tenuous hold on power was threatened in December when the USPD called on radical representatives of councils across the country to create a national "Soviet." To their great disappointment, most of the soldiers' and workers' councils dispatched delegates loyal to the SPD.⁸⁸ But shortly thereafter, radicals in the

⁸⁵ Gustav Noske, *Von Kiel bis Kapp: Zur Geschichte der Deutschen Revolution [From Kiel to Kapp: The History of the German Revolution]* (Berlin: Verlag für Politik und Wirtschaft, 1920), p. 11.

⁸⁶ Wheeler-Bennett, p. 35.

⁸⁷ This endeared him greatly to the High Command: "he had ...given proof at Kiel of his willingness to accept responsibility and his ability to take decisions, and his shrewd yet forceful handling of the mutinous sailors on that occasion had commended him to the approbation of the High Command." Noske's great virtue, in the words of Wheeler-Bennett, was that he was "prepared to defend the new Republic even to the effusion of blood and who was ready to offer implacable opposition to anarchy and disorder, be they ever so carefully disguised beneath the standard of democracy and brotherhood." Wheeler-Bennett, p. 35. Had Noske, or someone like him, been in Kerensky's place in 1917, the course of Russian history might have been very different.

⁸⁸ Specifically, the USPD and the Executive Committee of Six ordered the Soldiers' and Workers' councils across Germany to dispatch representatives to the capital. Groener and Ebert feared that this new assembly drawn from the radical councils would establish a national Soviet along the lines of Bolshevik Russia, and

3,000 strong *Volksmarine* Division – itself little more than an organized mob – refused SPD orders to disarm and seized government buildings in the center of Berlin. Attempts to dislodge them with regular soldiers of the Imperial Army failed.⁸⁹ In early January, the *Volksmarine* Division had to be bribed with “backpay” to disband.⁹⁰

This incident with the *Volksmariners* would have major consequences. First, the USPD members of the Council of People’s Representatives resigned on December 28 over the use of force against the *Volksmarine* Division. They were immediately replaced by SPD members, including the redoubtable Gustav Noske as Commander-in-Chief for Brandenburg, the territory surrounding and including Berlin.⁹¹ At this critical moment, Noske “recognized that the government must have a dependable military force behind it if it was to survive and rule Germany.”⁹² With the Imperial Army disintegrating rapidly, and red guards and “republican” militias forming in major cities, it was clear that the source of the new military force must be the old officer corps. Noske’s appointment of Colonel Walther Reinhardt as Prussian Minister of War in early January by the Council of People’s Representatives solidified the tenuous alliance between the military and the

between them sought to dispatch front line divisions to Berlin to suppress any possible violence. But most of the soldiers who did arrive in Berlin proved unwilling to enforce the will of the weeks’ old government; as Groener noted, “everyone wants to get home” for the first peaceful Christmas in five years. As it turned out, the fears of Groener and Ebert were to be relieved quickly. Most of the representatives dispatched to Berlin were loyal to the SPD or even the political center, rather than the more radical left. While this provisional national gathering of representatives did not trigger violence, it was soon to come in any case. Carsten, p. 16.

⁸⁹ Efforts by a few army units to drive the *Volksmarine* from the government buildings they occupied failed miserably. After firing a few rounds of artillery and exchanging some rifle fire, their efforts drew a growing crowd. Soon, “completely surrounded by jeering women and children, the once glorious Division of Horse Guards, took to its collective heels, and ran away.” Waite, p. 12.

⁹⁰ Harold J. Gordon, *The Reichswehr and the German Republic, 1919-1926* (Princeton: NJ: Princeton University Press, 1957), p. 22.

⁹¹ *Ibid*, p. 15.

⁹² *Ibid*, p. 14.

SPD by including a member – albeit a junior one – of the military in the ruling circle.⁹³ Further, it provided a concrete chain of command between the officer corps and the civilian government. Now, with some leadership in place, it was essential to reform the rudiments of an army from the ruins of the old.

THE ORIGIN OF THE FREIKORPS

The core of this new force would be drawn from the *Freikorps* [Free Corps]. As early as November 1918, groups of (mostly) right-wing veterans had organized themselves against the forces of revolution or to protect order and private property in their neighborhoods. The first, officially formed by General Georg Ludwig Maercker in December, drew from the organization and personnel of the *Stosstruppen* [Stormtroopers], the bands of elite infantrymen concentrated by the German High Command to use infiltration tactics to break through the enemy front.⁹⁴ These men shared a number of important features: first, they were uniformly young.⁹⁵ *Stosstruppen* units had to move fast over no-mans' land, and were almost universally commanded by the young and physically fit. Second, they tended to contain a very high percentage of officers (as high as one officer per four enlisted).⁹⁶ These men were volunteers, drawn to service by fears about the future of Germany. A typical recruiting poster highlighted their concerns:

⁹³ Gordon, p. 15.

⁹⁴ Waite, pp. 26-27.

⁹⁵ As Maercker wrote regarding the selection of young men for positions of prominence within his organization that “youth has the advantage of carelessness, of enterprising spirit, and above all, of patriotic fervor on its side – qualities that are not to be despised” Waite, p. 35.

⁹⁶ Waite, p. 27.

Comrades! The Spartacist danger has not yet been removed. The Poles press ever farther onto German soil. Can you look on these things with calm? NO! Think of what your dead comrades would think! Soldiers, Arise! Prevent Germany from becoming the laughing stock of the earth. Enroll NOW in the HUELSEN FREE CORPS.⁹⁷

In some instances, enlisted men or NCOs requested their favorite officers organize them into *Freikorps*. Others were drawn back to service by the calls of their senior officers. Noske and Reinhardt soon began placing loyal officers in charge of existing *Freikorps*, merging smaller units into larger ones and coordinating their movements.⁹⁸

Their timing was of the greatest importance. On December 31, 1918 a variety of radical groups, including the Spartacists and some members of the USPD, united to form the *Kommunistische Partei Deutschlands* [German Communist Party, or KPD]. Four days later, Ebert's government dismissed the radical leftist Emil Eichhorn from the position of Berlin's chief of police for refusing to respond to orders during the crisis with the *Volksmarine* division. The KPD voted for confrontation with the government to challenge his dismissal. The Spartacists, the core of the KPD's membership, organized demonstrations on January 5 which soon swelled beyond their control. Rioters occupied government buildings and newspaper offices and besieged the SPD government in the city center. For eight days, anarchy reigned in the streets of Berlin as nearly 20,000

⁹⁷ Waite, p. 39. Not unusually, "recruiting offices," such as that of the Huelsen Free Corps, were in fact beer gardens where the veterans would congregate.

⁹⁸ At the same time, they sought to block the rise of a leader capable of uniting all of the volunteer units in an anti-Republic coup. The best means to do so was to integrate the units into government forces as quickly as possible. They were also fortunate that no leader succeeded in meeting the political requirements necessary to assume leadership of the movement as a whole. Hindenburg was the logical candidate, but he remained out of the political limelight until 1925. Waite, p. 157.

armed “red guards” and workers organized a Revolutionary Committee and set about dismantling the SPD government.⁹⁹

As the first fires broke out, Noske withdrew from the city to the suburb of Dahlem with a few loyal General Staff officers. There they issued calls to former comrades in arms and veterans willing to support the SPD government. It was in Dahlem that the new German army would be born. Volunteer *Freikorps* units from across Germany began arriving and organizing themselves into a field army. Within three days, there were several thousand well-armed and disciplined troops, answering to the remnants of the Army High Command, and to Noske in particular. As these forces swelled in strength, Noske ordered General Freiherr von Lüttwitz, commander of the III Army Corps, to retake the city.¹⁰⁰ His soldiers, with the aid of artillery, began reconquering the capital block by block on January 8. On January 11, Noske entered the city in triumph in the company of 3,000 *Freikorps* men. At the cost of 13 military and 156 civilian dead – including the night-time executions of Spartacist leaders Rosa Luxemburg and Karl Liebknecht – Noske and the *Freikorps* had restored order, albeit temporarily.

This victory gave the SPD the time it needed to hold promised elections to a new National Assembly that would meet at Weimar beginning on January 20. The radical left had refused to participate in the elections. The result was a dramatic victory for the center and pro-Republic parties. The SPD would take 38 percent of the vote, and its Catholic center-left allies *Zentrum* would claim 20 percent.¹⁰¹ In coalition with the center-right

⁹⁹ Gordon, pp. 28-29.

¹⁰⁰ Gordon, p. 26.

¹⁰¹ John Wheeler-Bennett, *The Nemesis of Power* (London, UK: MacMillan Press, 1967), p. 37.

German Democratic Party (DDP), which had won 18 percent of the vote, the centrist parties possessed an absolute majority in the first post-monarchy National Assembly. These representatives met at Weimar shortly thereafter and drew up the Republic's constitution.¹⁰² Crucially, they created a strong legislative and weak executive, except for one provision: *Article 48*, which allowed the president – with the countersignature of the chancellor – to rule by decree in the event of a national emergency. This flaw would turn out to be the Republic's mortal weakness.

While the constitutional order solidified in Weimar, violence across the country was just beginning. Noske acted quickly after the legitimization of the elections, dispatching Freikorps units to reconquer city after city from revolutionary councils or anti-government forces. Bremen fell after a day-long battle on February 4. Cuxhaven, Bremerhaven, and Wilhelmshaven fell with minimal fighting by February 19. Meanwhile, in Berlin, the remaining Spartacists staged another attempted revolution on March 3. Raising 15,000 armed workers, Russian POWs and red militiamen, the revolutionaries announced a general strike, butchered police officers and seized control of the eastern half of Berlin. Noske immediately declared Berlin under a “state of siege” and

¹⁰² The National Assembly decided to preserve the bicameral legislature from the Kaiser's period, but dramatically weakened the upper house, the *Reichsrat*. The chancellor and the cabinet were drawn from the *Reichstag* – the lower house – to which it answered and could be recalled by a vote of no confidence. The position of chancellor itself was a very weak one: this figure would essentially function *primus inter pares* within the cabinet, which made decisions by majority vote. The other officer of prominence was the president. He was to be elected by national vote and hold office for seven years. His position, like the chancellorship, was generally a weak one. However, when *Article 48* of the constitution was invoked, the Reichspräsident gained considerable emergency powers, effectively ruling without the consent of the *Reichstag*. The language of Article 48 was problematic. It was vague on the nature of the emergency that the president could use to call for extra powers. And although the Reichstag could veto the president's invocation of emergency rule, the president in turn could dismiss the Reichstag and hold new elections two months later, rendering them impotent in the event.

rallied Freikorps units to the government's defense. The fighting in March proved much bloodier than January. One Freikorps officer told his peers,

Gentlemen! Anyone who doesn't now understand that there is a lot of hard work to be done here or whose conscience bothers him had better get out. It is a lot better to kill a few innocent people than to let one guilty person escape... you know how to handle it... shoot them and report that they attacked you or tried to escape.¹⁰³

Violence matched the rhetoric: revolutionaries deployed chemical munitions while Freikorps bombed the capital from the air and rolled tanks through the streets.¹⁰⁴ Both sides mutilated and dismembered prisoners who fell into their hands.

Government commands exacerbated the violence. On March 9, Noske issued an order that read "every person who is taken, arms in hand, fighting against government troops, is to be shot immediately."¹⁰⁵ This order, aggressive as it was, was interpreted broadly by the Freikorps officers leading the counter-revolutionary forces. In ferocious fighting from March 9 to March 16, the city's working class neighborhoods were taken, block by block. More than 1,200 revolutionaries were killed and thousands wounded.¹⁰⁶ The final reconquest of Berlin was followed by short, successful campaigns across the country by the increasingly well-organized Freikrops. At the beginning of May, the bizarre socialist republic that had sprung up in Bavaria was annihilated.¹⁰⁷ A final

¹⁰³ Waite, p. 89.

¹⁰⁴ Ibid, p. 71.

¹⁰⁵ Gordon, p. 31.

¹⁰⁶ Ibid.

¹⁰⁷ Waite, pp. 88-89. Under leader Kurt Eisner, Bavaria had been declared a "Free State" under USPD rule in November. But after Eisner's assassination shortly thereafter, more revolutionary forces seized control of the city, declaring a new Bavarian Soviet Republic. It proved to be one of the strange footnotes of history: its half-mad Commissar of Foreign Affairs Franz Lipp sent off a series of lewd telegrams to the Pope and Vladimir Lenin regarding the Bavarian Chancellery toilets. Another, sent to the government in Berlin, read "My dear colleague: I have just declared war on Wurttemberg and Switzerland because these dogs did not send me 60 locomotives immediately. I am certain of victory." Even more shocking, its new "government"

campaign in “Red Saxony” concluded on May 10, leaving the whole country in the hands of forces loyal to Noske and the government.¹⁰⁸

FROM FREIKORPS TO THE PROVISIONAL REICHSWEHR

The new government had only surmounted one of its many challenges. It now had a large number of men under arms, loyal to the military high command but less than committed to the SPD platform of nationalizations, high taxation and republican constitutionalism.¹⁰⁹ In addition, it faced the grave challenge of reaching an accommodation with the Allies on the final terms of a peace treaty. It was Noske who first officially proposed “an amalgamation of all separate [Frei]corps into one united and centrally controlled army.”¹¹⁰ He forced it through a hostile Reichstag as the SPD allied with the right against the other leftist parties.

organized a series of “mad sex orgies” in its party headquarters. The local SPD government, which had been chased out of Munich, was forced to turn to a Bavarian *Freikorps* unit led by rabidly right-wing Franz Ritter von Epp; this was awkward, as SPD functionaries had ordered Epp’s arrest for treason not long before. Epp, the future Nazi Reichskommissar for Bavaria, was soon joined by forces dispatched by Noske from Berlin, and began the reconquest of Bavaria on April 29. On April 30, a group of Bavarian Red Army soldiers massacred six prisoners being held in a local school, including “a woman of high rank and a prince of the Holy Roman Empire.” Local citizens rose in revolt, forcing Freikorps commander General von Oven to accelerate his timetable and move into Munich as quickly as possible. The sudden advance destroyed any chance for a bloodless surrender; hundreds were killed in four days of street fighting. The forces of von Epp and Ehrhardt, which led the way into Munich, committed horrible atrocities in the process. Waite, p. 83; Gordon, p. 48.

¹⁰⁸ Waite, pp. 88-90.

¹⁰⁹ Helmut Heiber, *The Weimar Republic*, translated by W.E. Yuill (Munich: Deutscher Taschenbuch Verlag GMBH, 1966), p. 24. On February 10, 1919, the new state’s temporary organization (the Law on Temporary Powers in the Reich) was approved by the National Assembly elected some three weeks earlier. Friedrich Ebert was elected President the next day. Ebert signed the final constitution in August of that year. His selection of Gustav Noske to remain on as Minister of Defense, and Count Ulrich von Brockdorff-Rantzau, a professional diplomat, as Foreign Minister were crucial.

¹¹⁰ Waite, p. 78.

The integration of the *Freikorps* into the new “*Vorläufige Reichswehr*” [Provisional Reich Defense Force] began on March 6, 1919, with a government decree reorganizing the military.¹¹¹ This new law established several important aspects of the Reichswehr. First, the president would be the supreme commander of all German military forces.¹¹² Second, the *Reichswehrminister* [Minister of Defense] within the chancellor’s cabinet would manage the incorporation of *Freikorps* units, oversee discipline, reform regulations and hear complaints of enlisted and junior officers against commanding officers.¹¹³

For Groener and Reinhardt, the question was how to integrate the *Freikorps* units, thus far loyal to their orders, into a new military structure. At the time of the Provisional Reichswehr Law, the Reichswehrminister had no functioning bureaucracy reporting to him, aside from the senior members of the General Staff and their network of *Freikorps* commanders. Starting immediately, the Reichswehrminister would act through the responsible ministries of each kingdom and state within Germany; beginning October 1, 1919, these ministries would all be combined into a single, national Reichswehministerium [Ministry of Defense], which would include the Army and Navy High Commands.¹¹⁴ What was left of the Imperial Army was officially dissolved and transferred under the control of the new Republican Ministry of Defense.

¹¹¹ “Gesetz über die Bildung einer vorläufigen Reichswehr [Act on the Formation of the Provisional Reichswehr],” *Der historischen Dokumenten*, Weimar Republic Document Collection, March 6, 1919, accessed May 1, 2011, http://www.documentarchiv.de/wr/vorl-reichswehr_ges.html

¹¹² “Gesetz über die Bildung einer vorläufigen Reichswehr [Act on the Formation of the Provisional Reichswehr].”

¹¹³ Gordon, p. 55.

¹¹⁴ *Ibid.*, p. 69.

Crucially for members of the old army, the new law reinstated the Imperial system of promotion, meaning that regimental and battalion commanders handled the appointment of all junior officers. Each pre-war *Wehrkreis* [defense district] would handle the incorporation of *Freikorps* and old Imperial troops into their respective forces. This meant that the Imperial officer corps, fundamentally hostile to the republic, was in the position to reshape the army as it saw fit.

As Harold Gordon has demonstrated, *Freikorps* were integrated largely based on their military efficacy and political composition.¹¹⁵ Groener, still serving as Quartermaster-General, worked with General Hans von Seeckt, head of the *Truppenamt* [Troop Office] to make the critical selections¹¹⁶ They agreed that any unit which had

¹¹⁵ Gordon, pp. 69-70. By and large, there were seven types of *Freikorps* units: those raised by Imperial generals; those that formed to guard national borders (particularly with the new state of Poland); regional and local groups which had formed to protect property and the rule of law; the naval brigades of right-wing officers; the Baltic *Freikorps*, which had moved into the Baltic states to fight against the Bolsheviks; Republican units formed in defense of the SPD-led Republic; and a miscellaneous remainder, drawn together by charismatic local leaders, usually former officers. Gordon, pp 431-438.

¹¹⁶ Born in 1866, Hans von Seeckt was the son of a military family of noble status from Pomerania. Despite a conventional military background, Seeckt took an unusual route to the Prussian Army; he received a civilian primary education, then enrolled in the “Kaiser” Alexander I Guards Regiment, a unit formed in honor of its Russian namesake during the Napoleonic Wars. Seeckt’s writings from prior to World War I indicate that he was a Russophile well before 1920. Perhaps this first assignment colored his views towards Russia. In any case, his intelligence and self-discipline led to a position at the General Staff Course in 1893, then the coveted promotion to the General Staff Corps. He was unique among his cohort for his wide-ranging intellect, his grasp of several languages (including French and English) and his love of travel – he had seen most of Europe, as well as Egypt and India. At the same time, however, he was aloof, arrogant, thin-skinned and hostile to criticism. His close subordinates found him difficult to work with, although the officer corps at large adored Seeckt for his strong hand and capable leadership. Carsten, among others, argues that Seeckt replaced the Kaiser in the Army’s affections as their “royal shield” and father figure.

Seeckt’s military experiences in World War I shaped his strategic and operational thinking. He was, in the light of history, one of the best operational minds in the German Army during the First World War. After eight months of highly successful service on the Western Front, from August 1914 to March 1915, Seeckt was promoted to chief of staff of the Eleventh Army on the Eastern Front, where he would spend the bulk of his wartime experience. He organized the brilliant Gorlice offensive, which netted the German Army 400,000 prisoners and opened up the conquest of Poland by German forces. He was also responsible for defeating Romania when that country entered the war, as well as saving the Austro-Hungarian Army from total defeat during the Brusilov Offensive. His military acumen, which won him friends in Bulgaria and Austria, then led to his assignment in Turkey as chief-of-staff of the Ottoman Army. At the end of the war, Hindenburg assigned him to lead all the German armies in the east, which meant

refused to follow their orders during the revolutionary events of the proceeding four months was to be disqualified. This included a number of the Republican formations. In addition, units which had been undisciplined in their behavior – including on the radical right – would not find service in the Provisional Reichswehr. Crucially for the future of German military innovation, they also decided that there should be a disproportionate number of General Staff officers in the new army, which was limited to only 4,000 officers by the Treaty of Versailles.¹¹⁷

The process of absorbing Freikorps units would last until early 1920, but by September 1919, the bulk of the work had been done.¹¹⁸ Twenty-five of the thirty “imperial” *Freikorps*, which were either commanded by an Imperial Army general or consisted of the remnants of an Imperial Army formation, entered the Reichswehr wholesale. About half of the local and politically center-left *Freikorps* were similarly incorporated, while none of the radical right-wing Baltic units were included. All told, 93 of the 146 *Freikorps* units were either added into the Reichswehr as they were constituted, or were broken up and their personnel distributed to other units.¹¹⁹ In

maintaining discipline, withdrawing them in good order and managing the chaotic occupation of Ukraine and the Baltic States. Undoubtedly, Seeckt’s service on the Eastern Front and the Middle East from March 1915 to April 1919 focused his interests and attentions on German strategy to the east. Carsten, p. 107; Matthias Strohn, “Hans von Seeckt and His Vision of a ‘Modern Army,’” *War in History*, 2005, Volume 12, Issue 3, pp. 318-337, p. 320. James S. Corum, *The Roots of Blitzkrieg: Hans von Seeckt and German Military Reform* (Lawrence, KS: University Press of Kansas, 1992), pp. 25- 27.

¹¹⁷ Gordon, p. 69.

¹¹⁸ Interestingly, not all Freikorps units wanted to join the new military: “supported by industry and conservative landed interests, they maintained their separate existence.” Other Freikorps units organized business “which required large groups of strong young men – trucking companies, bicycle renting agencies, road gangs, private detective bureaus and traveling circuses” designed to keep their units together. Many of these bands would retain their composition and a degree of training, serving as thinly veiled reserves for the Reichswehr. They would become known as the “Black Reichswehr”: secret paramilitary units ready to serve in the event of war. Waite, pp. 78, 189-190.

¹¹⁹ Gordon, p. 73.

essence, the *Freikorps*, formed specifically as the forces of anti-revolution, became the part of the core of the new military of the state: many of its officers were drawn from these formations.¹²⁰ The Imperial Army did not simply become the Weimar Army: it was transformed in an overtly political way through the process of the revolution.

THE TREATY OF VERSAILLES

The immediate international challenge to the new republic was the peace settlement. On May 7, 1919, new Foreign Minister Count Ulrich von Brockdorff-Rantzau was handed a 440-article draft text of Allied terms. There was to be no negotiation. Germany had three weeks to respond to the treaty with “observations,” which resulted in a few minor changes. When Brockdorff-Rantzau saw the full text of the treaty, which stripped Germany of all its colonies, required huge reparations payments, reduced the military to a shadow of its former strength and most controversially, ceded large tracts of Eastern Germany to the new state of Poland, he issued a counterproposal. It was rejected by the Allies, who on June 16 told the German minister that he had five days to accept the treaty or the Allied armies would begin marching east.¹²¹

Groener, Hindenburg and the German officer corps were particularly troubled by the massive reduction of the army to 100,000 men, by Article 228 – which sought the extradition and trial of German war criminals – and Article 231, the “war-guilt” clause.¹²² These clauses so inflamed passions within the army that there was serious debate of a

¹²⁰ Gordon, p. 59, pp. 78-79

¹²¹ Heiber, p. 36.

¹²² Groener recorded that “The 100,000 man army was for me completely out of the question, because it would not even be capable of ensuring peace at home.” Groener, p. 492.

coup to overthrow the SPD government, install Noske as military dictator and resume the war.¹²³ On the morning of June 19, senior military leaders secretly gathered in a stable to discuss a plan of action. Groener, who attended as representative of the General Staff, called the conference “a dangerous war council which could have caused the greatest possible political catastrophe for Germany.”¹²⁴ Minister of War Reinhardt proposed that “in the event of acceptance of the peace terms by the government there would be a general insurrection in the east,” which he advocated the government support.¹²⁵ General Groener attempted to convince those present such a course was folly, noting that the gentlemen present “spoke as if fighting in the East were completely separate from the potential events in the West.”¹²⁶ It was only with the grudging support of General Seeckt – who had been proposed as the chief of staff to Hindenburg in the event of renewed hostilities – that Groener won his case.¹²⁷

Meanwhile, Foreign Minister Brockdorff-Rantzau had resigned rather than accept the Allied terms. Philipp Scheidemann, Ebert’s new chancellor in the National Assembly, also resigned after an impassioned speech. At this juncture, the matter passed to the National Assembly, which asked Hindenburg, as head of the Army High Command, whether resistance was feasible. He replied in the negative.¹²⁸ On June 22, 1919, the National Assembly voted to accept the treaty with reservations. The following day, the

¹²³ Carsten, pp. 39-41.

¹²⁴ Groener, p. 503.

¹²⁵ Ibid, p. 503.

¹²⁶ Ibid, p. 503. He also noted that by his estimation, at least 85-95 percent of the general public in Prussia (by far the largest German state) wanted peace. Groener, p. 504.

¹²⁷ Carsten, p. 42.

¹²⁸ Heiber, p. 40.

newly appointed Bauer cabinet agreed to sign the treaty, claiming that the previous day's vote authorized their decision. On June 28, Foreign Minister Hermann Müller and Minister for Colonies and for Transport Minister Johannes Bell – who had jointly been in office for seven days – signed the Treaty of Versailles, officially ending the First World War.

The reaction of the German military, even more than the general public, was one of shock. Despite having imposed far more draconian terms on Russia in the Treaty of Brest-Litovsk, the terms – particularly those regarding demobilization and war guilt – were unbearable for the officer corps. The signing of the treaty had significant effects on the relationship between the state and the Reichswehr. The coalition government which had assumed power in the Republic was discredited in the eyes of the military by signing the treaty. Two cabinet ministers associated with the Treaty – Matthias Erzberger and Walther Rathenau – would be assassinated by former *Freikorps* members in 1921 and 1922, respectively. Noske, who had been immensely popular within the Army for his decisive leadership, suddenly faced calls to resign for his acceptance of the treaty terms.¹²⁹ And Groener, who had carefully shepherded the officer corps through the painful process, would also lose his base of support; he resigned as Quartermaster-General on September 30.¹³⁰ Groener was undoubtedly the most politically astute senior officer in the Reichswehr in 1919. His retirement and Noske's loss of popularity opened a wide chasm between the Reichswehr and the Republic.

¹²⁹ Heiber, pp. 40-41.

¹³⁰ This was in part due to the dissolution of the General Staff in July 1919. But Groener could have found another position in the new government. Noske, among others, encouraged him to stay on.

The military terms of the treaty require examination, given the enormously influential role they played in shaping the Reichswehr and its covert relationship with the Soviet Union. It was Section IV of the treaty which dealt explicitly with the German military. Articles 159 to 213 all dealt with the German military's immediate and rapid demobilization and disarmament, providing for only a small force, intended by the Allies to guarantee internal order and resist possible Bolshevik depredations. Article 160 required the reduction of the German Army to no "more than seven divisions of infantry and three divisions of cavalry." The total strength of those formations could not number more than 100,000, and all soldiers in excess of this figure were required to be demobilized by March 31, 1920.¹³¹ The officer corps could number no more than 4,000 men in total. Conscription, now eliminated, was to be replaced with twelve-year enlistments. This was to ensure that the German Army could not train large numbers of men in brief periods, a trick that the Prussians had used against Napoleon's similar treaty terms a hundred years before. The treaty also eliminated the German General Staff and nearly all military schools and academies in the country. The navy was to be shrunk to 15,000 men, possessing six old battleships, six light cruisers, twelve destroyers and twelve torpedo boats.

The German military was also to give up all the modern technologies of war: submarines, aircraft, poison gas and tanks were all explicitly banned under the Treaty. Further, the treaty established the Inter-Allied Commissions of Control (IACC), boards of officers from the victorious powers whose job it was to police the terms of the treaty. The

¹³¹ Heiber, pp. 40-41.

IACC was also to demilitarize German industry by closing down all “establishments for the manufacture, preparation, storage or design of arms, munitions or any war material whatever” except for a short list approved by the allied government.¹³²

In hindsight, the treaty which ended World War I actually provided Germany with a number of advantages. First, the post-war Wilsonian vision of self-determination dramatically improved Germany’s strategic position to the east. Instead of two major powers, Germany faced ten smaller states, many of which it would come to dominate economically in the interwar period.¹³³ The limitations on military spending – Germany spent the least in both absolute and per capita terms of any of the Great Powers on their military between 1919 and 1930 – played a role in the economic recovery that fueled German growth after the war. Even with the hyperinflationary crisis, German GDP in 1930 would be 32.9 percent higher than it had been in 1919, compared with contractions in Great Britain and Italy, and more modest growth in France.¹³⁴ It has also been argued that the restrictions on the size of the military enabled the Reichswehr leadership to craft an army more politically amenable to their interests. This is not entirely true. As shown earlier, the Reichswehr had already begun the process of self-selection. The army of 350,000 that existed in June 1919 was not significantly more right-wing than the final army of 100,000 that would emerge the following year.¹³⁵ But the ban on conscription

¹³² Treaty of Versailles, Article, 168. Generally, the portion of the IACC dedicated explicitly to military disarmament was referred to as the IAMCC, while the broader network of the victors was referred to as the IACC.

¹³³ Heiber, p. 42.

¹³⁴ A. Maddison, J. Bolt, J. and J. L. van Zanden, “Global Economic Statistics Database,” Angus Maddison Project, 2014, <http://www.ggdc.net/maddison/maddison-project/home.htm>.

¹³⁵ In particular, the exclusion of the radical right wing units from Bavaria and the Baltic States prove this to be the case.

and the long terms of service required by the treaty guaranteed that the military would remain highly professional and an exclusive preserve of the former Imperial Officer corps. This handicapped the ability of the Republic to alter the composition of the military throughout the 1920s. But more than anything, the Treaty of Versailles instilled in the military and a broad swathe of the general public a singular mission: the revision of the treaty by whatever means necessary.

SEECKT'S RESPONSE TO THE LIMITATIONS OF VERSAILLES

Hans von Seeckt, who led the Reichswehr through the stormy period from 1920 to 1926, developed a new vision of the Reichswehr in the aftermath of the Treaty of Versailles. It would serve as its guiding light until 1933. Seeckt decided, critically, that the army after World War One was more or less incapable of defending Germany's national boundaries given existing limitations in the Treaty of Versailles.¹³⁶ Efforts at border security were to be left to the police and others.¹³⁷ Seeckt focused his attention instead on new tactical and operational doctrine and the intensive training of future cadres.¹³⁸ The hope was that within a few years, the Reichswehr would be able, even with

¹³⁶ Given that the German army had been limited to so little ammunition that it would be combat effective for only a single hour in the event of a general war, this was not an inaccurate assessment.

¹³⁷ Otto Gessler, "Schutz der Ostgrenzen [Protection of the Eastern Border," August 2, 1920, GFM 33/3591, BNA, pp. 1-3.

¹³⁸ Defeat meant that in Germany, more than in France, Great Britain or America, there was a need to revisit and rewrite military doctrine in light of the war. Seeckt commissioned a series of historical studies of different aspects of the First World War. These have been heavily emphasized as the origin of Reichswehr military doctrine in the early 1920s; while important, Seeckt's own experiences in Serbia, Romania and on the Russian Front seem to have played an equally important part in the crafting of early Reichswehr principles and training. The two primary military manuals of the Seeckt period were *Heeresdienstvorschrift 487: Führung und Gefecht der verbundenen Waffen* [Combined Arms Leadership and Battle or F.u.G. 21] and *Ausbildungsvorschrift für die Infanterie* [Training Regulations for the Infantry, or A.V.I. 22].¹³⁸ The former appeared in 1921, the latter in 1922. What is remarkable about them is the

its small size, to parry an invasion from a hostile Poland, or even perhaps France. In addition, a future, rebuilt Reichswehr would play a critical part in attacking potential Allies to remedy Germany's strategic isolation.

Seeckt's vision became the core of *Führung und Gefecht der verbundenen Waffen* [Leadership and Combined Arms Combat] the first post-war field regulations published in 1921.¹³⁹ Commonly known as F.u.G., it dealt not with the existing Reichswehr, but instead with the "strength, armaments and equipment of a modern military great power."¹⁴⁰ In other words, it was Seeckt's vision for an expanded future military. As Robert Citino has argued, F.u.G. retained much of the vocabulary of the pre-war Moltkean army, emphasizing *Schwerpunkt* – the decisive point of a battle – as well as decisive battle, the *Vernichtungsschlacht*.¹⁴¹ But much of the rest was drawn from Seeckt's own experiences. F.u.G. concluded that the lesson of World War I was that "A mass [army] becomes immobile; it cannot manoeuvre and therefore cannot win victories, it can only crush by sheer weight."¹⁴² Instead, Seeckt argued that "the smaller an army is, the easier it will be to arm it with modern equipment and weaponry, while it is nearly impossible to arm a permanent army of millions with the newest equipment."¹⁴³ Seeckt hoped thereby to turn necessity into a virtue. Mobility and technology offered solutions to

degree to which they deviated not only from pre-war German doctrine, but even the views of Seeckt's predecessor, Walther Reinhardt.

¹³⁹ Citino, *The Path to Blitzkrieg: Doctrine and Training in the German Army*, p. 11, 23. Seeckt was responsible for the overall production of FuG, writing the introduction and editing the final product; it was his creation.

¹⁴⁰ Citino, *The Path to Blitzkrieg*, p. 12.

¹⁴¹ Ibid, p. 13.

¹⁴² Quoted in Strohn, "Hans von Seeckt and His Vision of a 'Modern Army,'" p. 322.

¹⁴³ Hans von Seeckt, "Moderne Heere," in *Gedanken Eines Soldaten* (Leipzig, K.F. Koehler, Second Print, 1935), p. 61.

the Reichswehr's nearly impossible strategic conundrum: Germany's encirclement by the much larger armies of France and Poland.¹⁴⁴

Seeckt concluded that the pace of technological change had restored the advantage to the offensive on strategic, operational and tactical levels.¹⁴⁵ As a result, his manual heavily emphasized *Bewegungskrieg*, or a war of movement.¹⁴⁶ He wrote that “the key to future victory was mobility.”¹⁴⁷ Only new technologies could guarantee the degree of mobility necessary to allow the future defense of Germany with the Reichswehr's limited numbers. As a result, Seeckt heavily emphasized changing technologies of war in F.u.G. In 1923, he added sections to it on air warfare, tanks and armored cars, chemical warfare and modern communications.¹⁴⁸ Lacking access to these types of equipment handicapped his efforts at training specialized mobile forces. Nonetheless, all of the major maneuvers from 1921 to 1926 included the simulation of tanks, aircraft and antiaircraft formations. Aircraft, for instance, were simulated by motorcyclists who were allowed drive around the maneuver grounds unhindered but not to converse with anyone.¹⁴⁹ When they returned to their command post, these “pilots”

¹⁴⁴ For more on the perceived (and sometimes real) threat from Poland, see Paul Niebrzydowski, “Das Deutsche Polenbild: Historicizing German Depictions of Poles, 1919-1934” (Columbus, OH: Unpublished Master's Thesis, The Ohio State University, OhioLINK Electronic Theses and Dissertations Center, 2012).

¹⁴⁵ Matthias Strohn, *The German Army and the Defence of the Reich: Military Doctrine and the Conduct of the Defensive Battle 1918-1939* (Cambridge, UK: Cambridge University Press, 2011), pp. 98-99. The great irony of Seeckt's forethought was that Germany's strategic position and the Reichswehr's own limited capabilities meant that it had to prepare for a defensive war.

¹⁴⁶ Citino, *The Path to Blitzkrieg*, p. 18. One marker of this emphasis was his instructions that only very rarely should German soldiers receive training in trench warfare in the aftermath of the First World War, unlike their equivalents to the West. Instead, even on the operational or strategic defensive, troops should constantly counterattack and not dig in.

¹⁴⁷ Corum, *The Roots of Blitzkrieg*, p. 31.

¹⁴⁸ Citino, *The Path to Blitzkrieg*, p. 13.

¹⁴⁹ *Ibid*, p. 120.

then could provide intelligence on enemy positions. In terms of armored warfare, Seeckt thought that the tank was too slow for a mobile offensive. Nevertheless, while Germany could not build or buy tanks, Seeckt established a Motor Troops Inspectorate, which was headed by young officers with considerable experience with armored vehicles from World War I. Using “paper panzers” – automobiles with wood and sacking added to give the rough appearance of a tank – these officers played the role of armored formations in maneuvers and training.¹⁵⁰

This playacting was a potent symbol of Seeckt’s vision. He foresaw that a technically proficient, technologically modern and highly professional army would enable Germany to escape from its strategic isolation. But this offensive strategic vision meant that the Reichswehr depended upon the accessibility and mastery of modern technologies of war. Such a task proved impossible under the constrictions of Versailles.

THE RUSSIAN CIVIL WAR

While the German Army tried to stave off revolution, the revolution in Russia was battling for its existence. The Russian Civil War, which began in earnest in May 1918, would reach its most critical phase in 1919. In the early summer of 1918, internal violence swelled with the revolt of the Czechoslovak Legion – a formation made up of Czech and Slovak POWs who had served in the Imperial Russian Army– and the loss of Siberia, the Urals and the Lower Volga to anti-Bolshevik Russian forces.¹⁵¹ The Allies

¹⁵⁰ David JA Stone, *Hitler's Army: The Men, Machines, and Organization: 1939-1945*, (Minneapolis, MN: MBI Publishing Company, 2009), 28.

¹⁵¹ The Czechoslovak Legion is usually referred to as the Czech Legion, as less than 10 percent of its membership was Slovak.

landed forces along Russia's Black Sea, Arctic Sea and Pacific Ocean coasts and began delivering military aid to anti-Bolshevik forces. The summer witnessed a series of disasters for the Red Army, including the desertion of a number of formations commanded by former Imperial officers. The Left SRs, the only remaining legal party besides the Bolsheviks, rose in revolt against the Bolshevik's signing of Brest-Litovsk on July 6, 1918, assassinating the German ambassador, arresting Feliks Dzerzhinsky (head of the Bolshevik secret police) and besieging the Kremlin. Shortly after their assault was beaten off, Lenin was nearly killed by an assassin's bullet.

The first major battles of the Civil War, fought in the Middle Volga region between the remnants of the Constituent Assembly and the Bolsheviks, started disastrously.¹⁵² Trotsky and Lenin dispatched Mikhail Muraviev, the best of the Red Army's commanders at this juncture of the war, towards Samara, where the Constituent Assembly's SR members had sought shelter. A lieutenant colonel of considerable experience, Muraviev began marshalling the full strength of Bolshevik forces in the Middle Volga region into four different armies. But then on July 10, he quietly left his headquarters, assembled 1,000 loyal men, and sailed down the Volga in the direction of Samara, announcing for the SRs in Samara. The defection of their top field general might have been a death blow to the Bolsheviks, but Muraviev was assassinated the next day by a young Bolshevik commissar before he could link up with the Czechs and Socialist

¹⁵²On June 8, local SR party representatives declared a new government, the "Committee of Members of the Constituent Assembly," or *Komuch*. This represented a very real threat to the survival of the Soviet state: in the Constituent Elections held in November 1917, the Socialist Revolutionary Party had won nearly 42 percent of the vote, nearly double the Bolsheviks. Radkey, p. 80.

Revolutionary Government.¹⁵³ The revolt caused panic in Moscow.¹⁵⁴ Lenin ordered Red Army commander-in-chief Bonch-Bruевич to transfer the fifty or so thousand men still in place opposite the German Army to the east, marking the complete reorientation of the war.¹⁵⁵

Trotsky went in person to the front to restore order and confidence. He also appointed Ioakim Vatsetis to take command of the Eastern Front.¹⁵⁶ Trotsky and Vatsetis began to organize a rapidly swelling force, as conscripts, Red Guards and remnants of the Imperial Army opposite the Germans all began to arrive along the Volga. By September 15, they commanded 70,000 men with considerable artillery support.¹⁵⁷ To hold this force together, Trotsky personally supervised the imposition of brutal discipline: on August 14, he announced that in any units retreating without discipline, the commissar would be shot first, then the commander.¹⁵⁸ This was not an idle threat: when one regiment retreated during the battle outside of Kazan, he “decimated” the unit, executing one man in ten,

¹⁵³Despite this first “success” of Trotsky’s commissar system, a well-organized SR Army advanced from Samara, took Simbirsk and then proceeded to take Kazan, the third-most important city in Great Russia. Mawdsley, p. 56-57.

¹⁵⁴ See Trotsky, “The Socialist Fatherland in Danger, “July 29, 1918,” in *The Military Writings and Speeches of Leon Trotsky, Volume 1: 1918*, 286-302.

¹⁵⁵ Mawdsley, p. 67.

¹⁵⁶ Vatsetis was the commander of the Latvian Rifle Division, the largest formation in the Red Army to come directly from the Imperial Army. The Latvian Rifle Brigades had been formed as German forces advanced into Latvia in 1915. Hoping to use anti-German nationalism to raise local volunteer formations, the Tsarist Army largely deployed these forces in Latvia. Beginning in 1916, the Imperial Army instituted conscription in Latvia to fill out the ranks of the now-brigade size formations. Used with little thought to their survival by their Imperial Commanders, the Latvians, already inclined to the left, participated in the February Revolution, but transferred their loyalty to the Bolsheviks as the party most likely to bring an end to the war. They served as the Bolsheviks’ troubleshooters during the crisis in Moscow with the SRs, leading to their commander’s promotion to leadership over the armies of the east.

¹⁵⁷ Mawdsley, p. 66.

¹⁵⁸ Trotsky, “Order by the Chairman of the Supreme Military Council and the People’s Commissar for Military and Naval Affairs No. 18- 1918,” August 14, 1918, in *The Military Writings and Speeches of Leon Trotsky, Volume 1: 1918*, p. 313.

including the commissar.¹⁵⁹ This proved the decisive moment, and less than two months later, the Middle Volga was in Red Army hands.¹⁶⁰

This first campaign played a major role in the development of the Red Army. Trotsky, who supervised much of the fighting – and at one point was nearly captured – gained invaluable experience at the front. Major administrative changes arrived during or immediately after the Kazan campaign. Overall supervision of the Red Army was reorganized into the *Revolutsionnii Voenii Soviet* [Revolutionary Military Council, or RVS].¹⁶¹ Trotsky joined the RVS as its chairman. Underneath the RVS were centralized all of the Soviet armies, as well as the administrative apparatus of the army. RVS was served in turn by an Operations Branch, which functioned like the General Staff of the Imperial Army. And indeed, it would be stocked with talented former Imperial General Staff officers like Boris Shaposhnikov and Pavel Lebedev.¹⁶²

The RVS immediately moved to delineate its forces, organizing three *fronts* – East, South and North. The concept of a *front* was borrowed from the Tsarist Army. The idea was that each *front* was assigned a strategic-level objective, that is, the defeat of an enemy state. Thus, during World War I, the major fronts had been deployed opposite

¹⁵⁹ Mawdsley, p. 67. Lenin also told Trotsky that if it appeared Vatsetis was hesitating in launching a counteroffensive against Komuch, Trotsky should follow the example of the French Revolution and shoot him. Mawdsley, p. 68.

¹⁶⁰ *Komuch* never succeeded in organizing effective resistance; it largely relied on the Czechs present to form the core of its military forces. On September 10, after considerable fighting, Kazan was retaken by the Red Army. On September 12, another force under the command of 26-year old Mikhail Tukhachevsky (of whom more later) retook Simbirsk, isolating *Komuch* in Samara. On October 7, with the Czechs withdrawing eastwards, the remnants of the *Komuch* army dispersed and their erstwhile capital fell to advancing Red Army forces.

¹⁶¹ In addition, Bonch-Bruевич was removed and replaced with Vatsetis, who now became commander-in-chief of the RVS; he had demonstrated only moderate competence in the field but solid political loyalty.

¹⁶² Erickson, p. 56.

Germany, Austria-Hungary and Turkey, respectively. The goal was the same in the Russian Civil War: each front had a particular enemy proto-state to defeat. The Eastern Front, where the remnants of the provincial government had taken up arms, was the central axis of battle in 1918 and early 1919. By December 1918, the Red Army on the Eastern Front contained five armies.¹⁶³ With this reorganization came new commanders. Trotsky replaced most of the Bolsheviks in positions of command with former imperial officers, closely watched by newly appointed commissars.¹⁶⁴ After his appearance at the front, he also issued Order Number 21 in August 1918, praising the “many young General staff officers...[who] have fought heroically in the recent battles on the Eastern Front.”¹⁶⁵ Trotsky would continue over the next two years to make great efforts in support of the military specialists, frequently criticizing commissars for trying to take power of command for themselves.¹⁶⁶ The decision to wholeheartedly fight for the loyalties of the military class proved decisive in the Red Army’s first campaign.

By November, the war in Western Europe was over and the Czechs in Russia on their way home. The conflict now centered on the various anti-Bolshevik forces gathering

¹⁶³ Erickson, p. 57.

¹⁶⁴ Jonathan D. Smele, ‘Aleksandr Alekseevich Baltiiskii,’ ‘Tikhon Serafimovich Khvesin,’ ‘Mikhail Mikhailovich Lashevich,’ and ‘Mikhail Nikolaevich Tukhachevsky,’ in *Historical Dictionary of the Russian Civil Wars, 1916-1926* (New York: Rowman and Littlefield, 2015), pp. 172, 575, 656, 1187. For instance, the Eastern Front’s senior commander was former Imperial Army Colonel Sergei Kamenev. Four of his army commanders were T.S. Khvesin (an Imperial Army N.C.O), Mikhail Lashevich (also an Imperial Army N.C.O.), Aleksander Baltiiskii (an Imperial Army lieutenant general), Mikhail Tukhachevsky (an Imperial Army lieutenant). Interestingly, three of the men listed here had political backgrounds that made them very acceptable to Trotsky. The NCOs had long histories of involvement with revolutionary politics, even before World War I. And Sergei Kamenev, who would lead the Red Army in the later phases of the Civil War, had reasonably strong credentials, having been elected Army Commander by a Revolutionary Soldiers’ Councils in May 1917.

¹⁶⁵ Trotsky, “Order by the People’s Commissar for Military and Naval Affairs to the Red Army and Red Navy,” August 11, 1918, in *The Military Writings and Speeches of Leon Trotsky, Volume 1: 1918*, p. 195

¹⁶⁶ Trotsky, “To the Commissars and the Military Specialists,” 1918, in *The Military Writings and Speeches of Leon Trotsky, Volume 1: 1918*, pp. 183-184.

at the country's periphery. The spring would see Trotsky at the Eastern, Southern and Western Fronts in rapid succession as the Bolshevik state found itself under attack by British and French-backed White Russian Armies on all sides.¹⁶⁷ Between December 1918 and October 1919, the White Armies would launch three major offensives into Bolshevik-held territory.¹⁶⁸ Important for the subject of this dissertation, the chaos of the early defeats in 1919 caused Trotsky to shuffle commanders, hoping to halt the defeats. In this process, Mikhail Frunze, a commissar who had served as a Bolshevik agent in the Tsarist Army during World War I, managed to secure an appointment as head of the Fourth Army.¹⁶⁹ One of his subordinate division commanders was the young Mikhail Tukhachevsky. Both men proved to be highly effective military commanders during the spring campaigns in the Urals.¹⁷⁰ The Red Army had found in Frunze and Tukhachevsky

¹⁶⁷ Erickson, p. 83.

¹⁶⁸ Mawdsley, p. 144; p. 146; p. 133. In November 1918, the Siberian Regional Government, the last vestige of the democratically-elected Constituent Assembly, was overthrown by military officers who made Admiral Aleksander Kolchak military dictator. Kolchak was a poor political leader and at best an average army leader; this perhaps was unsurprising given that he was a naval officer. Yet the presence of a unified command and British assistance, which began flowing into Vladivostok, turned his front into a formidable force. In December, Red Army Eastern Front forces were defeated in the Urals by the remnants of *Komuch*, combined with local Cossacks and officers' organizations now under Kolchak's command. The Red Army began a dogged retreat, losing the provincial capital of Perm on December 25, 1918, some 190 miles from where the Red Army's offensive had begun. This would be the preface to Kolchak's offensive. Earl F. Ziemke, *The Red Army: From Vanguard of World Revolution to US Ally* (London: Frank Cass Publishing, 2004), p. 86.

¹⁶⁹ Thomas M. Lafleur, *Mikhail Frunze and the Unified Military Doctrine* (Fort Leavenworth, KS: US Army Command and General Staff College, Unpublished MMAS Thesis, 2004), p. 29. Tukhachevsky, taking orders from first Frunze and then his replacement, Samoilo, grew incredibly frustrated at the stream of contradictory orders. At one point during the struggle, the precocious 26-year old wrote to his new superior Samoilo, pointedly citing the Red Army's new field manual "stating that it was 'necessary to think before issuing orders.'" Samoilo tried to charge Tukhachevsky with "disparaging a superior" but his reputation was already strong enough that the commissars of the RVS of the Eastern Front prevented it. Ziemke, pp. 91-92.

¹⁷⁰ Frunze organized much of the campaign, launching two brilliantly planned and executed offensives between May 5 and June 9, ably assisted by Tukhachevsky. Frunze had demonstrated military abilities far above any of the other old Bolsheviks who served in military positions, which marked him for rapid promotion.

the first of its great “Red Commanders,” young Bolshevik revolutionaries who were also successful military officers.¹⁷¹

The defeat of the forces of Kolchak in Siberia, followed by the halting of Yudenich outside of Petrograd proved the staying power of Trotsky’s reformed Red Army. But the gravest threat to the new Bolshevik regime was unfolding in the south. Facing the Red Army Southern Front were three White Russian Armies – the Volunteer Army, the Don Army and the Caucasus Army – commanded by the able Anton Denikin.¹⁷² Despite the dangers posed by Denikin’s forces, on May 12, the Red Army’s Southern Front went over to the offensive, taking the eastern Ukrainian city of Lugansk. Possessing a large and effective cavalry arm, the White Volunteer Army splintered the Red Army assault.¹⁷³ A few days later Wrangel’s Army crushed the Soviet Tenth Army, unleashing cavalry in the aftermath of the battle to chase down survivors in an operation more reminiscent of the nineteenth than twentieth centuries, an event with great importance.¹⁷⁴

¹⁷¹ The term applied to Tukhachevsky somewhat less neatly than to Frunze, as Tukhachevsky was from a noble family. He joined the Communist Party in 1918, likely out of opportunism. Nonetheless, as the Red Army’s most important interwar commander, he rose in part because he was considered politically reliable. Neil Harvey Croll, Mikhail Tukhachevsky in the Russian Civil War, University of Glasgow, Unpublished PhD Thesis, 2002, p. 54.

¹⁷² Denikin, like Kolchak, lacked good political sense. Infamously, his soldiers killed thousands of Jewish residents of Ukraine in a series of bloody pogroms, which brought international condemnation and also handicapped recruiting efforts. Worse, it made it politically difficult for the British, Denikin’s chief ally, to support broader aid, something Churchill pointedly told Denikin in a letter. And Denikin’s difficulties with the Cossacks, who were essential to his military efforts, also highlight a lack of diplomatic ability. Cossack forces were reluctant to move beyond the borders of their home territories and were often politically divided. During one exchange with the head of the Don Cossack Army, Denikin said that “the Don Host is a prostitute, selling herself to whomever will pay.” In response, the General of the Cossack Army replied that “if the Don Host is a prostitute, then the Volunteer Army [Denikin’s force] is a pimp living off her earnings.” Mawdsley, p. 165.

¹⁷³ Ziemke, p. 95. This also caused Nestor Makhno’s Ukrainian anarchists – at this moment allied to the Red Army – to renounce the Bolshevik cause and abandon the Soviet right flank.

¹⁷⁴ *Ibid.*, p. 95.

Buoyed by the victory on July 3, Denikin announced his “Moscow Campaign” would now commence.¹⁷⁵ Kiev fell in August as his cavalry formations continued to outflank the enemy and penetrate deep into the rear of Soviet formations. Worse from a Soviet point of view, Denikin was gaining strength as he went, in the form of enemy deserters and new conscripts as his forces entered ethnically Russian areas.¹⁷⁶ Partly following the advice of Wrangel, Denikin concentrated his three fastest military formations – two cavalry corps and the Volunteer Army – and pushed northwards, moving within 250 miles of Moscow by October 13. This was the crisis moment of the Russian Civil War, for besides Denikin’s advance, Yudenich suddenly resumed his stalled advance towards Petrograd.

The way in which the Red Army would triumph at this moment would permanently mark it during the interwar period. Under Semyon Budyenny, the Southern Front had increasingly begun to concentrate its cavalry in an effort to counter the superior White cavalry. In October, two small “shock groups” made up largely of cavalry swung around to outflank the advance of the White Russian forces. The decisive engagement took place near Voronezh, where Semyon Budyenny’s Cossack cavalry corps defeated General Mamontov’s previously invincible White cavalry. The process of amalgamating Soviet cavalry forces would continue after the initial victory in October, resulting in the creation of Budyenny’s famed First Cavalry Army.

¹⁷⁵ Ziemke, p. 103.

¹⁷⁶ Denikin had nearly 100,000 men by October, from 47,000 at the start of his offensive. Ziemke, p. 106.

The defeats around Voronezh marked the high water mark of the White Russian armies and precipitated the long retreat of Denikin's forces which would end in Crimea. As Red Cavalry forces began to attain superior numbers and experience, the Whites lost the advantage of mobility which had marked their successful summer campaign. Trotsky ascribed particular importance to this transformation in his writings after the war:

A special place in the development of the Red Army is held by the creation of the cavalry....In the civil war in the United States the advantage as regards cavalry was wholly in favour of the Southern plantation-owners. Only in the second half of the war did the Northerners master this arm. It was the same with us. The counter-revolution entrenched itself in the backward borderlands, and tried, pressing inward from there, to squeeze us into the central area around Moscow. The most important arm wielded by Denikin and Wrangel was the Cossacks, and in general, the cavalry. Their bold raids often, in the first period, created very great difficulties for us. However, this advantage possessed by the counter-revolution...proved to be within the reach of the revolution, too, once it had grasped the significance of cavalry in a civil war of maneuver, and had set itself the task of creating a force of cavalry at whatever cost.¹⁷⁷

Tactically, it was this development and concentration of Soviet cavalry which proved decisive on the Southern Front.¹⁷⁸ Speed, encirclement and mobility in a war of maneuver became central tenets of the Red Army in the second half of the civil war.¹⁷⁹ The war would continue into 1920, with the able Wrangel replacing Denikin in the south and drawing the war out. But the main threats to the Soviet state had receded.

¹⁷⁷ Trotsky, "Introduction," May 21, 1922, in *The Military Writings and Speeches of Leon Trotsky, Volume 1: 1918* p. 14.

¹⁷⁸ This is not to say that the development of Soviet cavalry occurred without problems. After the victories of October and November, Budyenny was put in charge of the First Cavalry Army with the bulk of the Soviet Southern Front's horsemen. But in January 28, White Russian General Mamontov, having mustered an even larger Cossack cavalry horde, roundly defeated Budyenny and drove him back. But by that juncture, the war's conclusion was inevitable, and on March 1, the Soviets had bottled up Denikin's forces; Denikin went into exile, leaving Wrangel in command. Mawdsley, pp. 115-116.

¹⁷⁹ Though it must be said, the Red Army was never quite fast enough to effectively encircle enemy formations, even in the heyday of Budyenny's First Cavalry Army.

Why did the Red Army win the Civil War? It was a question senior Red Army leaders and planners would debate in trying to shape the interwar Red Army. Leadership had been important. By the end of the war, the Red Army had produced several outstanding commanders, such as Tukhachevsky and Frunze. It had retained the core of the old Imperial Army's general staff and a significant portion of the Imperial bureaucracy. Geography had clearly played a role, too: controlling the major cities and armaments factories meant that the Red Army always had more resources from which to draw. The core of the Bolshevik state contained more than 60 million people, while Kolchak's rear area had perhaps 20 million and Denikin's less than 8 million.¹⁸⁰ The Whites had to travel farther without the advantage of the rail network which was so much better in central Russia. And the Bolsheviks had the advantage of interior lines.

All of these factors played a part, but the political causes of victory were perhaps the clearest to the victors.¹⁸¹ The Bolsheviks succeeded in mobilizing the peasantry better than their opponents; not by much, but by enough to create the mass armies that would win them the war.¹⁸² Their political program – ending the unpopular war with Germany, vague promises of a socialist economic policy, and offers of national autonomy to minority nationalities – gave them a far broader popular base from which to execute the war. Trotsky would write that the successful alliance of worker and peasant was

¹⁸⁰ Mawdsley, pp. 146-147.

¹⁸¹ Of course, this class-based argument fit into Marxist orthodoxy better than any sort of tactical or strategic analysis which glorified the hated military specialists. As a result, in the immediate aftermath of the war, the Red Army was inclined to take as the lesson of the war the primacy of a new, revolutionary type of warfare, predicated on mobilization of the masses. This would become the origin of the concept of a "proletarian way of war," posited by Red Commanders who argued that the Russian Civil War represented a new departure in the history of warfare.

¹⁸² Figes, "The Red Army and Mass Mobilization during the Russian Civil War 1918-1920," p. 209.

decisive.¹⁸³ Indeed, workers never made up more than 15-18 percent of the Red Army.¹⁸⁴ A neglected aspect of this policy is the successful wooing of more than 300,000 Imperial officers and NCOs who formed the core of the Soviet Army. The two commanders-in-chief of the Red Army throughout the civil war were both Imperial Army colonels.¹⁸⁵ The Red Army was largely a peasant army, commanded by officers and NCOs who had served under the Tsar, and supervised by a relatively small group of Bolsheviks for whose vision the war was being fought.¹⁸⁶

UNOFFICIAL COMMUNICATIONS, 1918-1920

While Weimar Germany and Soviet Russia endured revolution, civil war and international condemnation, they also began to forge ties to each other. That process appeared implausible in November 1918, yet only eighteen months later, the two states had exchanged official representatives and were moving towards the normalization of relations. The origins of this rapprochement began with the terms of Germany's defeat in the First World War. The armistice terms imposed on Germany by the Allies on November 11, 1918 required the immediate renunciation of the terms of Brest-Litovsk. But it also mandated that German troops stay in their current positions in the east for the time being, as a bulwark against the expansion of Bolshevism. Even before the Germans

¹⁸³ Figes, p. 209.

¹⁸⁴ Erickson, p. 76.

¹⁸⁵ Mawdsley, p. 278.

¹⁸⁶ Three quarters of Red Army personnel were peasants; almost four fifths of the officer corps was composed of former Imperial officers. Less than one fifth of the five million soldiers and officers mobilized during the war were identified as anything other than peasant or "specialist." Figes, "The Red Army and Mass Mobilization during the Russian Civil War 1918-1920," p. 168.

made moves to end relations with the Bolsheviks, the Soviets severed diplomatic ties and then, on November 13, officially renounced the Treaty of Brest-Litovsk.¹⁸⁷ As instability engulfed Germany, the Bolshevik Central Committee waited for the expected revolution: the events of November 1918 to mid-January 1919 suggested the immanency of Germany's collapse.

Given the ideological, domestic and international barriers to interaction, it is hardly surprising that there was tremendous reluctance among both Soviet and German leaders to consider reestablishing ties immediately after the war. There were deep splits in both the Foreign Ministry and the Reichswehr over the question of dealing with the Bolsheviks. In early 1919, there was a small group, the *Ostpolitik* [Literally, Eastern Politics] faction within the *Auswärtiges Amt* [Foreign Office] that saw economic and political cooperation with Russia as the only means out of an otherwise impossibly difficult international environment.¹⁸⁸ The more realistic of them saw working with the Soviets as possible leverage for Germany in its relationship to the West. When the war ended, two of these *Ostpolitik* officials took over the management of Russian POWs in Germany: Moritz Schlesinger and Moscow-born Gustav Hilger. But the most important figure for the German Foreign Ministry's Eastward policies was Baron Ago von Maltzan, former charge d'affaires in Beijing who had also spent time as a diplomat in Russia. After World War I, he was assigned to the management of the Russia desk in the Foreign Ministry at Wilhelmstrasse. He used this position, after the war's end, to pursue discreet

¹⁸⁷ Haigh, Morris, Peters, p. 26. Hilger recalls that the Germans in fact severed relations first over the discovery of a shipment of German-language propaganda to the Russian envoys in Berlin.

¹⁸⁸ *Ostpolitik* is generally used to refer broadly to an eastern orientation in German foreign policy.

contacts with the Bolshevik regime and push economic collaboration.¹⁸⁹ Arrayed against these men was much of the ruling SPD and Zentrum coalition, dedicated to policies of “fulfilment”: that is, meeting all Allied terms for reparations in the hopes of reintegration with the West.¹⁹⁰

In Moscow, a similar debate raged over relations with Germany. On one hand, there was a large faction that saw any accommodation with the capitalist world as a betrayal of Bolshevik principles. Lenin himself was eager for revolution in Germany; he had written that the revolution was “doomed if the German revolution does not break out.” But he also viewed German economic assistance to Bolshevik Russia as essential.¹⁹¹ He hoped that such assistance would be brought about under the aegis of a communist federation after a successful revolution in Germany: Russia would exchange its natural resources for German finished goods and gain valuable expertise in the development of its own industries. But given the defeat of communist uprisings in January and March 1919, the Bolsheviks had to consider the alternative of beginning cooperation with Germany while simultaneously undermining its government.¹⁹²

¹⁸⁹ Maltzan’s opponents attempted to get rid of him by reassigning him to Athens but the collapse of the first government of Chancellor Wirth instead led to his promotion to assistant head of the powerful Eastern Office.

¹⁹⁰ In 1922, for instance, Foreign minister Friedrich Rosen, under Chancellor Wirth, would thus dispatch Kurt Wiedenfeld as German envoy to Russia; Wiedenfeld was “firmly opposed to any arrangements which Germany alone might make with Russia.” Hilger, Meyer, p. 68.

¹⁹¹ Haigh, Morris, Peters, p. 28.

¹⁹² David R. Stone, “The Prospect of War? Lev Trotskii, the Soviet Army, and the German Revolution in 1923,” *The International History Review*, Vol. 25, No. 4 (Dec., 2003), pp. 799-817, p. 816. They would maintain, briefly, a German Communist Government “in-exile” in Moscow: in the summer of 1918, the Soviets had encouraged a group of German POWs to establish the Central Revolutionary German Workers’ and Soldiers’ Committee. In November 1918, this group took over what had been the German Embassy, giving them a sort of de facto recognition as an alternate government to that of the *SPD*. Hilger, p. 34.

There were also immense logistical issues with reestablishing relations. The Bolsheviks were in the midst of their civil war, which only reached its apogee in October 1919. They were also at war with the Allied states, who were simultaneously occupying parts of Germany and dictating onerous peace terms. In between Moscow and Berlin was a vast war zone, filled with new states engaged either in civil war or wars with their neighbors. As a result, early communications between the Bolsheviks and Weimar Germany were limited to three unofficial means: Karl Radek, prisoner of war exchanges, and a series of unofficial German envoys sent to Moscow.

In December 1918, a number of senior Bolsheviks, including Karl Radek, the recently deported Adolf Joffe and Nikolai Bukharin secretly entered Germany in order to attend the Congress of Soviets planned for late December in Berlin. After the obliteration of the Spartacists in January, Radek was caught, arrested and locked up in Moabit Prison in Berlin. Here, for the next ten months, he held a sort of jailhouse salon.¹⁹³ In the absence of other official representatives, he was visited by senior German politicians, diplomats and military officers, and given the ability to communicate with the outside world.¹⁹⁴ Eventually, he would move into the apartments of a German staff officer, an

¹⁹³ He was treated fairly roughly until August, when he was put in very comfortable rooms and then given increasingly broad freedoms. Radek drew surprisingly high numbers of senior German government officials among his visitors. Among his frequent guests were Talaat and Enver Pasha, a General von Reibnitz, Walther Rathenau, Paul Levi, Klara Zetkin, Felix Deutsch, Colonel Max Bauer, and Admiral Paul von Hintze. Carr, pp. 19-22. One reason for this was his personality: German diplomat Gustav Hilger recalled that Radek was charming, pleasant and full of witticisms. German was also his first language. He also knew his audience. Talking to the Catholic rightist Hilger, Radek confessed that, despite being an Austrian Jew and convinced atheist, he had baptized his daughter into the Russian Orthodox Church. When asked why, Radek said that he and his wife had in their hire a beloved Russian nanny who “could not bear the thought of caring for a girl who could not partake in the blessings of the Christian Church.” This story, among others, endeared the Old Bolshevik to Hilger. Hilger, p. 73.

¹⁹⁴ Edward Hallett Carr, *German-Soviet Relations Between the Two World Wars, 1919-1939* (Baltimore: The Johns Hopkins Press, 1951), pp. 17-20.

indication how important the German military considered their prisoner.¹⁹⁵ Radek's presence maintained a slim line of communication between the two regimes.¹⁹⁶

The two states' foreign ministries would be connected not through the work of Radek, but rather through prisoner of war exchanges. When the November Armistice arrived, there were more than a million Russian prisoners still in German hands. The Russians likewise held several hundred thousand Central Powers POWs, mostly from Austria-Hungary.¹⁹⁷ These POWs had not yet been repatriated when the two sides had abrogated the Treaty. This resulted in a tremendous human tragedy. For several weeks after the armistice, the German government, facing famine at home and without the resources to care for the hundreds of thousands of Russians in captivity, had simply begun packing them on train cars to the truce-line between the German and Bolshevik forces and releasing them. A German diplomat on his way from Moscow to Berlin recalled that

I was shaken to my heart by the pitiful sight of those tens of thousands of Russian prisoners of war coming from the opposite direction... They were transported to Orsha in sealed boxcars and then dumped into the laps of Soviet authorities completely unprepared for the rush... I can still hear today the shuffling sound of thousands of feet moving past the train on the right and left. Many of the Russians collapsed from hunger, cold or exhaustion, and remained lying beside the tracks.¹⁹⁸

¹⁹⁵ Vourkoutiotis, p. 60.

¹⁹⁶ The process of releasing him proved rather difficult. To exchange him directly would be to recognize the Soviet regime. To simply release him would be a propaganda coup for the Bolsheviks and stir outrage among the radical right. In the end, Radek was "exchanged" for German hostages with semi-independent Bolshevik-controlled Ukraine. Vourkoutiotis, p. 50

¹⁹⁷ Thousands of German and Russian POWs had been exchanged in the spring of 1918, when Germany desperately needed the manpower. But the vastly larger number of Russian POWs and the turning tide at the front caused these efforts to slow and then stop by November 1918. From November 1918 to January 1919, the confused issue of POW status led both sides to simply free most of the prisoners they had, and either point them in the direction of the border or dump them at the edges of the new state of Poland.

¹⁹⁸ Gustav Hilger, Alfred G. Meyer, *The Incompatible Allies: A Memoir-History of Soviet-German Relations, 1918-1941* (New York: Hafner Publishing Company, 1971), p. 22. "The German carriage was

But this flow of POWs soon ceased as the Allies entered Germany and began to assert control. The Allies, as well as the new Soviet and Weimar states, had political causes for caution regarding the exchanges of prisoners. Stories reached the German High Command that German POWs in Russian hands had been radicalized, serving in both the Russian Civil War and the Hungarian Revolution of Bela Kun.¹⁹⁹ In Moscow, the Bolsheviks heard rumors that the Allies intended, after the armistice, to rearm and reequip Russian POWs in Germany to form an “army of liberation” intended to destroy the Bolshevik regime.²⁰⁰

In January 1919, the Allies formed an Inter-Allied Commission for the Repatriation of Russian Prisoners.²⁰¹ In the same month, Germany set up a competing body administered by Moritz Schlesinger, a German businessman well-acquainted with Russia. Entitled the *Reichszentralstelle für Kriegs- und Zivilgefangene* [the Reich Central Office for Military and Civilian Prisoners], this agency was given responsibility by the

actually attacked by the POWs marching by: “..Nor do I blame a small group of these unfortunate people for attempting to break into our warm boxcar by force. When they failed to do so, they decided to burn the car. In the last second, as though by a miracle, we escaped the danger of being burned alive when the train suddenly started to move once again.” Hilger, Meyer, p. 23.

¹⁹⁹ Robert C. Williams, “Russian War Prisoners and Soviet-German Relations, 1918 to 1921,” *Canadian Slavonic Papers*, Vol. 9, No. 2 (Autumn, 1967), pp. 270-271.

²⁰⁰ There was some truth in this: the Interallied Commission for the Repatriation of Russian Prisoners was intent upon managing the dispatch of Russian prisoners in such a way as to influence the outcome of the Russian Civil War. Specifically, they intended to release only those whom they saw as politically reliable, and send them to join Denikin’s forces in Ukraine. According to Robert Williams, some Russian POWs were released from custody to go fight against the Bolsheviks in the Baltic states. The German government, initially concerned that the Russian POWs might end up fighting on the side of the revolutionary left, soon became concerned that the German military and other right wing groups might use them to overthrow the state from the right. Williams, pp. 273-275. To what degree this German agency would be used for political ends was unclear: the German government also considered the possibility of using the POWs in its possession against the Bolsheviks: in April 1919, German Chancellor Müller discussed the arming of Russian POWs with his cabinet. “Memo, Reichschancellor Müller,” April 4, 1919, GFM 33/4539, BNA, pp. 1-11.

²⁰¹ Williams, pp. 273-275.

Allies for feeding and housing the POWs so the Allies would not have to shoulder the costs.²⁰² It was staffed, by and large, with members of the German Foreign Ministry or business community with experience in Russia. From January to November 1919, the Allies attempted to manage the slow discharge of Russian POWs back to Russia. But in November, the IACC relinquished complete control over the Russian POWs back to the German government. Shortly thereafter, the *Reichszentralstelle* requested that the Ebert government give it permission to open direct communication with the Soviets regarding POW exchanges. This was granted. Viktor Kopp, a friend of Trotsky's, arrived informally in Germany to manage the POW repatriation process.²⁰³ His real instructions were open "normal diplomatic relations" between Germany and the Soviet Union, as well as explore the possibilities of military and economic cooperation.²⁰⁴ Negotiations between Kopp and Schlesinger (the functional head of the *Reichszentralstelle*) produced immediate results. On April 19, 1920, both men agreed to allow the establishment of POW Repatriation Offices in each country's capital.²⁰⁵ Schlesinger's ally Gustav Hilger was duly dispatched on June 7 to Moscow to establish the German Office. Meanwhile, Kopp stayed on in Berlin to form the Soviet office. On July 7, 1920, both Kopp and Hilger were extended the fundamental diplomatic prerogatives: "personal immunity...to maintain courier communications with their own governments, to use code and to

²⁰² Hilger, Meyer, p. 23.

²⁰³ Williams, p. 292.

²⁰⁴ Viktor Kopp, "Tov. V.I. Leninu [To Comrade Lenin]," August 14, 1920, 5-1-2136, l. 4, Rossiiskii Gosudarstvennii Arkhiv Sotsialno-Politicheskoi Istorii, Moscow (RGASPI), pp. 1-3.

²⁰⁵ Hilger, Meyer, pp. 24-25. The economic element was of great urgency, as the Soviet Union remained under Allied blockade.

exercise consular functions.”²⁰⁶ A “provisional representative,” Kurt Wiedenfeld, was dispatched the following year to function as head of the German mission in Moscow.

The Reichswehr also sought a separate means of communicating with the Soviet regime. In the aftermath of the armistice, German armies remained throughout Eastern Europe, still backing the array of puppet regimes established in the aftermath of Brest-Litovsk. Indeed, in March 1919, the Allies gave German forces permission in the Baltic states to launch an offensive against Bolshevik forces in Latvia. Led by General Rüdiger von der Goltz, German Freikorps units succeeded in assisting the Latvians in establishing independence.²⁰⁷ But as German forces withdrew and Bolsheviks advanced in their stead, the tense demarcation line faded from the map. A number of German officers foresaw a different sort of relationship with the Soviets. With the wholehearted approval of Karl Radek, Seeckt would dispatch his first envoy to Moscow, in April 1919.²⁰⁸ This was Ismail Enver Pasha, the former Turkish minister of war.²⁰⁹ His first mission ended dramatically in Kowno, Lithuania, as noted above. The second also failed to reach

²⁰⁶ Hilger, Meyer, p. 25.

²⁰⁷ Vourkoutiotis, pp. 37-38.

²⁰⁸ Radek recorded in his memoirs, “Enver, having fled after the rout [of Turkey] through Soviet Russia illegally to Germany, was the first to bring home to the German militarists that Soviet Russia was a new and growing world force with which they would have to count, if in fact they meant to struggle against the Entente...I tried to persuade them [Enver Pasha and Talaat Pasha, the former Turkish Prime Minister] to go to Russia, which in fact Enver Pasha did later on” [Vourkoutiotis, p. 40].

²⁰⁹ Enver Pasha, “Hans von Seeckt-Enver Pasha Korrespondenz, 1920-1921,” in General Friedrich von Rabenau, *Hans von Seeckt: Aus Seinem Leben (1918-1936) [Hans von Seeckt: From His Life]* (Hass und Koehler, Leipzig, 1940), p. 306-8. Von Seeckt had served in Turkey from 1917 as the Chief of Staff of the Turkish Armed Forces on behalf of the German Military. In that position, he had become friends with Enver Pasha, who was then Minister of War. Von Seeckt apparently did not disapprove of the Armenian Genocide as it went on, as he believed improved national unity might aid the Ottoman Empire’s war effort. Enver Pasha was the architect of that policy, initiating the mass deportations of Armenians on Turkish soil. When the Pasha was forced into exile by the defeat of Turkey in 1918, he sought refuge in Germany. His personally close relationship with Mustafa Kemal meant that he would remain an unofficial messenger for the new state of Turkey, as well as Germany.

Moscow. But in the summer of 1920, he tried again and succeeded in reaching Moscow.

²¹⁰ He arranged to meet with Leon Trotsky, then Commissar of Military Affairs, on the Reichswehr's behalf.²¹¹ He wrote back to General Seeckt on August 26, 1920, to note his success:

Today I spoke with ... Trotsky. With him there's a faction that has real power, and also includes that party that stands for an understanding with Germany. That party would be willing to acknowledge the old German borders of 1914.²¹²

Thus, by early 1920, the German Foreign Ministry had an envoy – Gustav Hilger – in Moscow, and the Russians one of their own – Viktor Kopp – in Berlin. The Reichswehr, too, had reestablished tenuous connections to the Bolsheviks. As the Bolsheviks turned the tide of the Russian Civil War, the diplomatic and strategic possibilities for the Soviet-German relationship began to grow.

THE POLISH-BOLSHEVIK WAR, 1920-1921

The Treaty of Versailles and Allied intervention in the Russian Civil War drew Germany and Soviet Russia towards each other in late 1919. But the greatest impetus to the Soviet-German relationship came in a different form: the new state of Poland. Future

²¹⁰ Felix Dzerzhinsky, "Telegrammi F.E. Dzerzhinskogo v Moskvu V.I. Leninu i v Minsk v RVS Zapadnogo Fronta I.T. Smigle o pribyvshem iz Germanii Enver Pashe [Telegram from F.E. Dzerzhinsky to Moscow and VI Lenin and to the Revolutionary Military Council on the Western Front and to I.T. Smigla about the arrival from Germany of Enver Pasha," August 11, 1920, 76-3-106, l. 1-2. RGASPI, I 1-2.

²¹¹ Enver Pasha "Letter to Hans von Seeckt," reprinted in Rabenau, p. 307

²¹² Ibid, p. 307. Enver Pasha led a strange life from 1918 to 1922. He flew to negotiate arms deals between the Soviet Union and Turkey, as well as to feel out the possibility that the Soviets would grant the Central Asian Republics independence. But he soon discovered he was unwelcome back in Turkey by the nationalists led by Mustafa Kemal. With no country to negotiate for, he offered his services to the Bolsheviks in suppressing the Basmachi revolt in Uzbekistan. Upon arrival, he defected to the rebellion, declared himself a representative of the Prophet Muhammad and Emir of Bukhara, and attempted to create a Pan-Turanian Empire in Central Asia. After ten months, and some victories, he was killed by Red Army troops.

Commissar of Foreign Affairs Vyacheslav Molotov would call Poland the “monstrous bastard of Versailles.”²¹³ The German High Command agreed. Both states had, as their primary foreign policy objective in the interwar period, the destruction of the state of Poland. For Germany, there were more than a million ethnic Germans in the new state. East Prussia was cut off from the main body of Germany by the Polish corridor. And, of course, racism against the long-subordinated Poles also played a role. For the Soviets, as Trotsky wrote, “Poland can be a bridge between Germany and us, or a barrier.”²¹⁴ Soviet leadership believed in 1920 that only with access to the industrialized economies of the West could the Bolshevik revolutionary regime survive. As long as the state of Poland existed, this mutual objective proved to be a lodestar, guiding the two states in parallel.²¹⁵

As the Russian Civil War drew towards a close, the Bolsheviks found themselves facing an invader from the west. Moving far beyond traditionally Polish areas, new Polish head of state Josef Pilsudski led the newly formed Polish Army into what is now Ukraine and Belarus in April and May, 1920.²¹⁶ But Pilsudski’s advance was poorly

²¹³ Norman Davies, *God’s Playground: A History of Poland, Volume II: 1795 to Present* (Oxford, UK: Oxford University Press, 2005), p. 291. Davies provides a litany of attitudes towards the new state of Poland. Among others: “Stalin called it ‘pardon the expression,’ a state. J.M. Keynes, the theorist of modern capitalism, called it ‘an economic impossibility whose only industry is Jew-baiting.’ Lewis Namier called it ‘pathological.’ E.H. Carr called it ‘a farce.’ David Lloyd George talked of a ‘historic failure,’ which had ‘won her freedom not by her own exertions but by the blood of others....in 1919 Lloyd George was reported as saying that he would no more give Upper Silesia to Poland ‘than he would give a clock to a monkey’....Adolf Hitler called it ‘a state which arose from the blood of countless German regiments....a ridiculous state where...sadistic beasts give vent to their perverse instincts.” In the 1920s, Poland’s only consistent defenders were in increasingly enfeebled France and the isolationist United States.

²¹⁴ Xenia Joukoff Eudin, Harold Henry Fisher, *Soviet Russia and the West, 1920-1927: A Documentary Survey* (Stanford, CA: Stanford University Press, 1957), pp. 181-182.

²¹⁵ The Molotov-Ribbentrop Pact shows exactly how central Poland was to Soviet-German cooperation. With Poland’s destruction, the common interests of the two states centered solely on the economic exchange of Soviet raw materials for German finished goods. This proved less than sufficient to overcome the myriad of geopolitical and ideological causes for conflict.

²¹⁶ Mawdsley, p. 250.

timed. Lenin and the Bolsheviks had turned the tide against their Entente and White Russian adversaries in late 1919.²¹⁷ White Russian General Alexander Kolchak had been captured and killed in February 1920, and Anton Denikin's forces no longer posed a significant threat. As a result, when the Poles boldly advanced and took Kiev on May 7, 1920, they began encountering tough opposition in the form of veteran Red Army units.²¹⁸ Between January and May, 1920, Red Army strength facing the Poles increased 500 percent; by May, it numbered 20 infantry divisions and 5 cavalry brigades.²¹⁹ As Red Army forces concentrated against Pilsudski's forces, the Polish advance slowed and then halted. The Polish Army's triumphal occupation of Kiev would last only a month, from May 7 to June 13. On July 4, senior Red Army General Mikhail Tukhachevsky launched a massive counteroffensive.²²⁰ Polish forces soon found themselves outnumbered and far from their supply depots. The front collapsed as Red Army forces advanced more than 500 miles in less than five weeks.

By August 10, 1920, the fate of Poland hung by a thread. The Red Army moved westwards at a rate of over 20 miles a day in July.²²¹ Tukhachevsky's primary objective was Warsaw, but as the front dissolved in front of them, senior Red Army commanders

²¹⁷ Mawdsley, p. 251.

²¹⁸ For more details on the campaign leading up to the battle, the Polish Army's Wojskowe Biuro Historyczne [Military History Bureau] produced an official, multi-volume history of the battle, *Bitwa Warszawska* [Battle of Warsaw] in 1935, which contains details on the summer campaign of 1920.

²¹⁹ Norman Davies, *White Eagle, Red Star; the Polish-Soviet War, 1919-20* (London: Macdonald Publishing, 1972), p. 2. M. Tukhachevsky, "The March Beyond the Vistula," in Jozef Pilsudski, *Year 1920 and its Climax Battle of Warsaw during the Polish-Soviet War, 1919-1920* (New York: Pilsudski Institute of America, 1972), p. 87.

²²⁰ It was far from a continuous front: manpower and materiel shortages, coupled with limited logistics, made a World War I style-front impossible.

²²¹ Michael S. Neiberg, David Jordan, *The Eastern Front 1914-1920: from Tannenberg to the Russo-Polish War* (London: Amber Books, 2008), p. 218.

began to contemplate the possibility of overturning the entire European order. As the advance gathered steam, Tukhachevsky issued orders that exhorted his soldiers to advance ““To the West! Over the corpse of White Poland lies the road to worldwide conflagration.””²²² Things looked so dire in the Polish capital that Josef Pilsudski resigned as head of state and headed to command the front in person in a desperate gamble to defeat the coming Soviet offensive. Viktor Kopp in Berlin told his German counterparts that he would press for the transfer of the Polish corridor to Germany in the planned peace settlement of defeated Poland.²²³ In Moscow, Lenin had begun forming the government of a new, communist, Poland.

But events intervened to change the course of history. Poor communication and the interference of a political commissar named Josef Stalin delayed the movement of Budyonny’s feared First Cavalry Army into its intended position. Pilsudski took full advantage of the gap in the center-left of Tukhachevsky’s front. Comprised of three full armies, the Polish counterattack began on August 16 and caught Soviet forces completely off guard. Instead of seizing Warsaw, the Red Army risked encirclement.²²⁴ Two entire

²²² Conan Fischer, *Europe between Democracy and Dictatorship: 1900 – 1945* (Hoboken, NJ: John Wiley and Sons Publishing, 2011) p. 124.

²²³ “Besprechung mit Herr Kopp [Meeting with Mr. Kopp],” July 19, 1920, KO 095872, Politisches Archiv des Auswärtigen Amtes, Berlin (PA-AA), p. 2.

²²⁴ In his memoirs, Pilsudski described his desperate counterattack, launching the offensive into what appeared to be a powerful Bolshevik force, the Mozyr group. To his shock, he encountered little resistance, and began a rapid enveloping movement of the Soviet left flank. However, we now know that Pilsudski was better informed than he let on in his memoirs. Intelligence reports, which he does not mention, informed him on August 15th that the army group connecting Tukhachevsky’s center, anchored by the XIVth Army, and his left flank, comprised of the Ist Cavalry Army, was little more than a mirage. The Polish-Bolshevik War would also play a major role in the revision of Soviet military doctrine and strategy. The conduct of the war looked very different from the Russian Civil War. It was a war of rapid maneuver – even faster than the campaigns of the Civil War - which highlighted the difficulties of winning a decisive engagement. Tukhachevsky had crushed the Poles in Ukraine and in Belarus, but failed to end the war. The Polish-Bolshevik War was technologically and operationally less sophisticated than the First World War on the Eastern Front, but reiterated many of its lessons. More importantly, it contradicted the lessons already

Soviet armies were driven into the newly delineated borders of East Prussia, where they were interned by the German government.²²⁵ The Poles continued to advance, but by October, with winter approaching, both sides were exhausted. A ceasefire followed, before negotiations eventually concluded the Treaty of Riga in March 1921, giving Poland far more territory than the Treaty of Versailles had initially intended.²²⁶ The survival of Poland, the “pillar of Versailles,” convinced the German military that the Treaty would remain in force.²²⁷

SEECKT AND THE ORIGINS OF GERMAN MILITARY OSTPOLITIK

When German exchanges with the Soviet Union began in 1919, the Bolshevik government was in the midst of a desperate struggle with White Russian, Entente and Polish forces.²²⁸ But by August 1920, the situation had changed. The Bolsheviks stood poised to take Warsaw and reach Germany’s borders. In this difficult moment, the

being written about the Russian Civil War. Polish peasants and workers had not backed the invading Russians. Class antagonisms had not proven decisive. Instead, even convinced communists had to acknowledge the causes of defeat seemed to echo the arguments of the military professionals.

²²⁵ These 30-40,000 men were repatriated the following year after the Treaty of Riga.

²²⁶ The critical week between August 12 and 19 became known as the “Miracle on the Vistula.” It was coined sardonically by a member of the Polish political opposition to suggest that Josef Pilsudski’s victory had been entirely by the grace of God, rather than any brilliance on Pilsudski’s part. The phrase caught on. Pilsudski defended himself vociferously in his memoirs. While citing divine intervention on Pilsudski’s behalf may be unfair, it seems from their respective combat records that Tukhachevsky was the abler commander. The decisive factor, if we take Tukhachevsky at his word, was the Polish recognition of the gap in Soviet forces in front of them and the cutting off of Soviet communications with the 4th Army. For more on the foreign policy decisions surrounding the Battle of Warsaw, see Ian Johnson, “The Fire of Revolution: A Counterfactual Analysis of the Polish-Bolshevik War,” *Journal of Slavic Military Studies*, Vol. 28, No. 1 (March 2015).

²²⁷ Jeffrey Korb, *Poland Between East and West: Soviet and German Diplomacy toward Poland, 1919-1933* (Princeton, NJ: Princeton University Press, 2015), p. 65.

²²⁸ In 1919, Red Army units were fighting American, Armenian, Austrian, Azerbaijani, British, Czech, Estonian, French, Finnish, Latvian, Lithuanian, German, Georgian, Japanese, Polish, Turkish, Ukrainian – and of course, Russian – soldiers.

leading figures of the Weimar Republic were torn. General Ludendorff, among others, hoped to form a coalition against the Bolsheviks.²²⁹ But three occurrences largely destroyed the opposition towards an alliance with Soviet Russia. First, the senior officers against such an arrangement were mostly members of Germany's racial right. Erich Ludendorff, Rüdiger von der Goltz, and the faction that would develop around Lüttwitz all saw cooperation with Soviet Russia as an ideological betrayal; specifically, they "believed that the overthrow of Bolshevism and the restoration of the monarchy in Russia was the necessary condition of a German-Russian alliance."²³⁰ But the failed military coup in March 1920 – the Kapp Putsch – drove many of these men out of the Reichswehr, guaranteeing the ascendancy of the pro-Russian clique around Seeckt.²³¹ In addition, the efforts of the French in breaking up what remained of Germany undermined those smaller number of officers inclined to seek accommodation with the western powers. Most blatant was the French-backed "declaration of independence of the Rhineland," made on June 1, 1920.²³² Finally, at the Spa Conference in July 1920, German Chancellor Constantin Fehrenbach requested that Germany be allowed to retain a standing army of 200,000 men, rather than 100,000, in order to repel any communist incursion.²³³ The Allies refused. It was now clear that Germany would not be included in an anti-Bolshevik crusade, something that had been proposed by German government

²²⁹ Vourkoutiotis, pp. 3-4.

²³⁰ Carr, p. 22.

²³¹ It also guaranteed Seeckt command of the Reichswehr. His superior, General Reinhardt, resigned over the matter.

²³² Vourkoutiotis, p. 49.

²³³ Gorlov, p. 34.

representatives a number of times.²³⁴ At that juncture, the *Ostpolitik* faction decisively gained the upper hand.

Seeckt was the leader of the pro-Russia clique within the government. He envisioned *Ostpolitik* as necessary for the restoration of German military power. In particular, he had concluded that “Soviet Russia alone was the only other nation interested in the weakening, if not the destruction, of an independent Poland.”²³⁵ He considered Poland the lynchpin of the Versailles system. Only with an ally to the east could France maintain its encirclement of Germany. With the Soviet invasion of Poland, Seeckt found his opinion confirmed.²³⁶ Promoted to *Chef des Heeresleitung* [Chief of the Army Command] in March 1920, he tailored German defense policy accordingly. Beginning in July 1920, Bolshevik forces increasingly strayed across the borders of East Prussia as they fought the Polish army. In response, Seeckt gave strict orders that all Reichswehr officers must “avoid any conflict with Russia or even the outward display of a hostile attitude towards Russia. On the other hand, any cooperation or assistance towards representatives and troops of the Entente Powers must be avoided...”²³⁷ He went on to note that members of the military or general public openly supporting White Russian or Anti-Bolshevik forces should be taken into “protective custody.”²³⁸ Seeckt

²³⁴ “Memo Regarding German Use of Reichswehr,” August 3, 1920, War Office [WO] WO 32/5784, BNA, p. 1.

²³⁵ Haigh, Morris, Peters, p. 72.

²³⁶ The Soviets did indeed offer, through the approaches of Kopp and an unknown Red Army officer, to help restore Germany’s former frontier to the East. But when victory seemed assured in early August 1920, the Soviets reneged on the offer; Kopp told Maltzan that “if a Soviet regime was instituted in Poland, [Russia] would determine Poland’s frontier with Germany based on ethnographic factors” [Himmer, p. 678].

²³⁷ Hans von Seeckt, “Fernschreiben vom Offizier an Offizier [Telegram from Officer to Officer]” July 23, 1920, GFM 33/3591 (BNA), p. 1.

²³⁸ Ibid.

outwardly obeyed orders relayed from Chancellor Fehrenbach and Minister of Defense Otto Gessler for strict neutrality in the Polish-Bolshevik conflict. But his version of German neutrality clearly favored the Bolsheviks.²³⁹ Indeed, the Polish government consistently complained to the Allies that the German military, as it withdrew from Eastern Europe in 1919 and 1920, provided material aid to Bolshevik forces, looted local towns and even attacked Polish garrisons.²⁴⁰ The Reichswehr also began passing limited intelligence on the Polish Army to the Soviets, beginning in 1920.²⁴¹

But the truest statement of Seeckt's *Ostpolitik* would come at the height of the Polish-Bolshevik War. When Seeckt believed the Red Army had defeated the Poles in the Battle of Warsaw in August 1920, he made his position vis-à-vis the Soviets very clear for the first time. He penned a memo to a handful of senior officers on August 8, beginning by stating that he had heard the rumors:

The Russian victory over Poland has aroused moods and hopes within the German military which blur our possible courses of action at this time. Notably, it has revived the idea that Germany could overthrow the Treaty of Versailles with the help of Russian Armies in Poland, waging a new war against the Entente.²⁴²

²³⁹ Interestingly, this was not true of the entire German government. Members of the German Foreign Ministry and some of the civilian leaders of East Prussia hoped for a Polish victory in the Polish-Bolshevik war. "Memo on Poland," Aug 6, 1920, GFM 33/3591, (BNA), p. 1. But it is clear that many members of the political right, especially within the military, were more concerned about a defeat for the Entente, as well as the possibility of regaining lost territories in the East, than they were about the possibility of a Bolshevik invasion of Germany. News of Tukhachevsky's offer to return lost German territories doubtless reinforced their view that the Bolsheviks were more friend than enemy.

²⁴⁰ Colonel H.H. Wade, "Cipher Telegram to Mr. Balfour," January 18, 1919, Foreign Office Records (FO) 608/266, 196 (BNA), p. 1. Colonel Wade detailed the fighting between German and Polish forces in his reports back to London.

²⁴¹ "Report, Polish Military Mission to the Supreme Allied Command," July 7, 1920, Box 3, Folder 2, Pages 10-18, Instytut Józefa Piłsudskiego w Ameryce in New York (IJP-NYC), pp. 1-8.

²⁴² Hans von Seeckt, "Memorandum," August 8, 1920, RH2-29/1, Bundesarchiv-Militärarchiv, Freiburg im Breisgau (BA-MA), pp. 1-2.

Seeckt continued by noting the general weakness of the Soviet regime. He explained the dilapidation of its war industries, noting its largest factories, like the Putilov Works, were producing only a tiny fraction of their pre-1917 output.²⁴³ He added details of the chaos of its transportation network and Russia's severe agricultural difficulties.²⁴⁴ The point, he made clear, was that Russia was in no condition to back Germany in a general European war, especially one in the face of another long-term blockade. Instead, Seeckt proposed an alternative: "We want to enter into friendly economic exchange with Russia to help Russia resume its internal development and undermine the very idea of the Soviet system by making sound alternatives available."²⁴⁵ Seeckt hoped to turn Russia into an ally through economic cooperation. Not only would such a course moderate communism in Russia, but it also might make Russia a source for raw materials in a future European war.

More subtly, von Seeckt envisioned that trade relations with Russia might provide him with the sort of leverage necessary to keep the Bolshevik regime from aiding the KPD. In the same memorandum, von Seeckt stated that he viewed the KPD as the biggest threat to Germany's survival: "We must face Bolshevism as a closed state and reject international Bolshevism's strongest terms. This requires absolute order domestically and the most rigorous struggle against any revolution."²⁴⁶ The Soviet state sponsored the KPD throughout the revolutionary violence of 1920-1923, a fact known by the German

²⁴³ Hans von Seeckt, "Memorandum," August 8, 1920, RH2-29/1, Bundesarchiv-Militärarchiv, Freiburg im Breisgau (BA-MA), pp. 1-2.

²⁴⁴ Ibid.

²⁴⁵ Hans von Seeckt, "Memorandum," August 8, 1920, 1-2.

²⁴⁶ Ibid.

government.²⁴⁷ Seeckt hoped to use a relationship with Soviet Russia to force the Bolsheviks to abandon their support for the KPD and revolution in Germany. But the Bolsheviks would do so only after the failure of a last uprising in 1923.²⁴⁸ Increasingly close ties between the two militaries would prove of importance in stabilizing relations. A German Foreign Ministry memo noted in August 1923 that the Soviets, especially the Red Army, were now cooperative on the issue of the KPD: “Russian policy must now seek to avoid complications... because the army desires [cooperation], especially since they have not yet developed the [desired] technical resources and equipment.”²⁴⁹ These resources and equipment formed a final component of Seeckt’s plan. He hoped to transfer banned German military industry to Russia, where it could serve as a basis of supply for the Reichswehr in a future war.

²⁴⁷ “Unterbringung deutscher Kommunisten in Russischen Betrieben [Accommodating German Communists in Russian Enterprises]” November 25, 1925, R/1501/20330, Bundesarchiv Lichterfelde (BA-L). One of the future Soviet commandants of the school at Kazan, Josef Unshlikht, was actually living in Germany and actively attempting to undermine the Weimar Republic in 1923.

²⁴⁸ “Die Welt Erobern [Conquering the World],” *Der Spiegel*, October 30, 1995 <http://www.spiegel.de/spiegel/print/d-9224698.html>. Some have argued that cooperation continued throughout the 1920s and 1930s. Indeed, the German Foreign Ministry was worried that the Soviet Union might meddle in the political crisis of 1932 which catapulted Hitler to the Chancellorship. Konstantin von Neurath “Memorandum, December 19, 1932, R31497/E496919, (PA-AA), p. 1.

²⁴⁹ “Bericht, Russland [Report, Russia],” August 3, 1923, R 31676/R 31677, PA-AA. Of course, the timing of that Foreign Ministry piece was quite poor, as the Soviets were in the process of helping the KPD plan an insurrection which would launch in October 1923. But after 1923, the Soviets by and large abandoned revolutionary efforts in Germany. See also: Karl-Heinz Niclauss, *Die Sowjetunion und Hitlers Machtergreifung. Eine Studie über die deutsch-russischen. Beziehungen der Jahre 1929 bis 1935* (Bonn: Röhrscheid, 1966).

THE VIEW FROM MOSCOW

Just as it did in Germany, the Polish-Bolshevik War forced the reconsideration of Soviet foreign policy.²⁵⁰ Lenin and the Soviet leadership discussed how aggressively they would move westward after the battles of August 1920. Germany was ripe for revolution. But the threat of a general war loomed: Allied troops occupied the Rhineland and monitored the plebiscites on Germany's eastern boundaries.²⁵¹ At the same time, the Soviet state was unable to feed its own people, let alone fight a major war against the victors of World War I.

During the summer of 1920, as events proceeded rapidly in Poland, Lenin was busy with the Second World Congress of the Comintern in Moscow. It became clear to those around him that he was struggling with the question of how boldly to export the Revolution. In the critical months of 1920, Lenin and the Politburo swung back and forth between the two great strains of Soviet foreign policy: "permanent revolution" and "peaceful coexistence." Lenin's first goal was to safeguard the revolution in Russia. Even in the summer of 1920, Wrangel and a White Army continued to operate in Ukraine, and some 70,000 Japanese soldiers cooperated with the remnants of Kolchak's army in Siberia.

²⁵⁰ Excerpts from the following section are edited versions of those which appeared in Ian Johnson, "The Fire of Revolution: A Counterfactual Analysis of the Polish-Bolshevik War, 1919 to 1920," *The Journal of Slavic Military Studies*, Issue 28, No. 1, pp. 156-185.

²⁵¹ Silesia and Danzig were two of the most important Entente occupation zones in the aftermath of World War I, each hosting thousands of allied soldiers. Relatively little has been written about either. For more, see **Nicolas** Beaupré, "Occuper l'Allemagne après 1918 [The Occupation of Germany after 1918]," *Revue Historique des Armées*, Issue 254, 2009, p. 9-19. Also of value is T. Hunt Tooley, *National Identity and Weimar Germany: Upper-Silesia and the Eastern Border 1918-1922* (Lincoln, University of Nebraska Press, 1997).

Lenin's opening speech to the Congress on July 19, 1920 revealed his priorities: his address centered on Germany and Western Europe.²⁵² Shortly thereafter, two French Communists asked Lenin how quickly the Red Army would move forward into Central Europe. Lenin replied, "if Poland gives itself to Communism, the universal revolution would take a decisive step.' He stops, seems to reflect, then thinking out loud, 'Yes, Soviets in Warsaw, it would mean Germany shortly falling due....it would mean bourgeois Europe cracking apart.'"²⁵³ A few days later, he made similar statement, thinking half out-loud: "Should we stop at the frontiers? Declare "Peace"? It is vain to imagine this!"²⁵⁴ He then added that if uprisings did not occur in Poland and military situation proceeded badly, he remained opposed to "risking a dangerous turn of events."²⁵⁵

While he mused on Poland, Lenin proceeded both diplomatically and militarily. In mid-July, as their troops advanced, the Bolsheviks began negotiations with the Western Allies through two representatives stationed in London.²⁵⁶ They offered to halt any continued offensive action against the Poles in exchange for "Versailles"-like impositions against the Poles: the disbandment of most of the Polish Army, limitations on arms and potential reparations for soldiers.²⁵⁷ Yet simultaneously, Lenin sent a constant stream of telegrams to the front (particularly to Stalin, then a commissar on the front

²⁵² V.I. Lenin, "First Session Speech," Second Congress of the Communist International. Minutes of the Proceedings (Moscow: Publishing House of the Communist International, 1921) p. 1.

²⁵³ Thomas Fiddick, *Russia's Retreat from Poland: From Permanent Revolution to Peaceful Coexistence* (London: Macmillan Press, 1990) p. 122.

²⁵⁴ Fiddick, p. 123.

²⁵⁵ Ibid, p. 123-124.

²⁵⁶ "Peace negotiations between Poland and Russia," July 1920, FO 688/6, 7 (BNA), p. 1.

²⁵⁷ Ibid.

lines) with orders for aggressive action; he told Stalin on July 12 to “hasten orders for a furious intensification of the offensive.”²⁵⁸ These contradictory policies revealed another consistent theme in Soviet foreign policy: fighting while negotiating.²⁵⁹ They also showcase Lenin’s own caution: he planned to export Communism into Central Europe so long as the military situation was favorable. But the defeat of the Red Army in front of Warsaw in August broke the revolutionary spell cast over the Bolshevik leadership, and they began to become increasingly conventional in foreign policy, returning to the well-worn tracks of Imperial Russian foreign policy in their dealings with their borderlands and the Great Powers.

There is some debate about precisely which members resisted the normalization of Soviet foreign policy with Germany.²⁶⁰ Generally, those associated with the

²⁵⁸ Earl F Ziemke, *The Red Army, 1918-1941: From Vanguard of World Revolution to America's Ally* (New York: Routledge, 2001) p. 124.

²⁵⁹ Negotiating while fighting, used extensively in the Russian Civil War, would become a staple of communist diplomacy the world over. Given the lack of respect for diplomatic norms and the view that capitalist regimes were fundamentally illegitimate, communist regimes often dangled the prospect of peace while their militaries continued aggressive operations in an effort to weaken enemy resolve. This strategy would be used again by Stalin against Japan, by Mao in the Chinese Civil War, by Kim Il-Sung in North Korea, and most famously, by the North Vietnamese government during the Vietnam War.

²⁶⁰ The exact partitions are confused by the destruction of Trotsky’s legacy in Soviet historiography, as well as the flood of forged Polish intelligence documents which appeared in the summer of 1920. While Trotsky’s writings suggest a more moderate course, a critical Polish intelligence document, purportedly from a member of the senior ranks of the Soviet Politburo, noted the following: “On July 6, in Moscow, at the Kremlin, a meeting of the Commissioners of War with Poland took place....Trotsky, Kamenev, Zinoviev and Soviet generals stood on one side [for war] while those leaning in the direction of peace included Lenin, Chicherin, Krassin, Radek and the present author. Trotsky demanded exploiting the effects of offensive until the very end, bringing the offensive to the west as far as possible, and bringing it to the edge of Germany; he argued that inciting rebellion in revolutionary Germany would be a trifle.” “Memorandum: Do Adjutantury Generalnej [Memo: To the Adjutant General],” July 29, 1920, Box 2, Folio 26, 296-300 (IJP-NYC) p. 1-2. The letter from which this was drawn does not disclose any classified information and urges Poland to surrender to the Soviets, as the author claims that the Soviet Union desires only peaceful relations with its neighbors. It seems that the letter was approved by senior Bolsheviks before being sent. Given the quantity of forged documents generated by the Polish government in the summer of 1920 hoping to solicit outside aid, this must be taken with some caution, but the other contents of the letter are in line with what is now known about the ongoing debate within the Soviet government.

Comintern or with the political Left, like Adolf Joffe, “complained to Moscow of the inadequacy of the current Soviet policy [in Germany] – he felt that they were not aggressive enough.”²⁶¹ On the other side, Radek, fresh from Berlin, told Lenin that it would be possible to form a “Russian-German alliance in the form of a *modus vivendi*, between Communism and Capitalism.”²⁶² The Soviet envoy in Berlin, Kopp, added to Radek’s arguments, reporting that the KPD was in a parlous state, divided against itself and incapable of winning a revolution. Writing back to the Politburo, he described the KPD “as being very weak, and possessing very little control over radical elements.”²⁶³ He said any attempted uprising was bound to fail.

This proved a decisive argument in moving the Soviets away from agitation. In June 1920, the Politburo “sought to curb the influence of the Comintern’s activities in Germany.”²⁶⁴ At the same time, they also decided to expand Soviet Russia’s conventional intelligence network in Germany, which, in 1923, would be directed to assist the KPD in overthrowing the German government.²⁶⁵ Thus the increasing conservatism in foreign policy – and the expectation that the USSR would be treated as a normal member of the community of nations – was nonetheless accompanied by continuing efforts to undermine

²⁶¹ Vourkoutiotis, p. 55. This also included the Soviet security services. Hilger would write that he knew his diplomatic offices were constantly monitored and even broken into by Cheka/OGPU agents. One time, they even left a key broken off in the lock on his desk. Hilger, Meyer, p. 162.

²⁶² Haigh, Morris, Peters, p. 67.

²⁶³ Vourkoutiotis, p. 111.

²⁶⁴ *Ibid.*

²⁶⁵ In 1920, the Soviets decided to set up an official spy network in Germany; “Germany requires a comprehensive investigation not only from diplomatic and political, but also from military and economic, points of view.... The central residents should pay the most series attention.... in the military sphere it is necessary to find out the real forces of Germany, those provided for by the Treaty of Versailles, as well as those being organized... in the guise of various kinds of societies and organizations.” “From the Draft Plan Setting up a Secret Service in Germany,” 1920, F. 33987-3-25, l. 93-95, Russian State Military Archives (RGVA), reprinted in Dyakov and Bushuyeva, pp. 34-35.

foreign governments, ostensibly through “non-state agencies.” This Janus-like policy of simultaneously pursuing revolution and accommodation would dominate the next three years of German-Soviet relations. But it allowed, in a limited way, room for the normalization of diplomatic relations and the beginnings of economic exchange.

THE INITIATION AND ORGANIZATION OF SECRET MILITARY COOPERATION

In the space of the next twelve months (January 1921-1922), the changing international landscape would encourage both the Peoples’ Commissariat for Foreign Affairs [NKID] and the Auswärtiges Amt (AA) to continue to move towards a standardization of exchange. In January 1921, the German government announced its inability to continue making payments on reparations liabilities. On March 8, 1921, the Allied Reparation Commission reassessed Germany’s liabilities, but announced they did not recognize the claim that Germany was in default or incapable of making payments.²⁶⁶ Shortly thereafter, Aristide Briand, the Prime Minister of France, announced French military mobilization and a plan to occupy the Ruhr if Germany did not comply. Germany resumed payment, but only by beginning to print money at an accelerated rate, triggering the hyperinflationary crisis which would inflict considerable damage on the German economy.²⁶⁷ In the Soviet Union, defeat in the Polish-Bolshevik War led to an increasingly sober assessment of Soviet foreign policy by Lenin and Trotsky. In addition, the Kronstadt rebellion in March 1921 had seriously shaken the Bolshevik elite. It was in

²⁶⁶ Haigh, Morris, Peters, pp. 92-93.

²⁶⁷ Ibid, pp. 92-93.

the aftermath of its brutal suppression that Lenin would inaugurate the New Economic Policy to allow the recovery of the Russian economy. This meant the possibility of larger-scale exchanges with foreign corporate interests.

With these events providing the impetus, the German POW office in Moscow met with Radek and Chicherin to formalize an exchange of representatives to deal with the POW question. On May 31, 1921 the Soviets ratified this first official agreement with Germany since the armistice.²⁶⁸ It came close to extending *de jure* German recognition of the Bolshevik regime. A few weeks later, Lenin would recommend to the Politburo that Soviet Russia simultaneously pursue economic and military cooperation with Germany.²⁶⁹

As the Soviet-German relationship moved forward after the Polish-Bolshevik War, Seeckt decided to create a formal structure for the management of its military components. To that end, in the fall of 1920, Seeckt ordered the establishment of a secret bureau, *Sondergruppe R*, under which military relations with Russia would be managed.²⁷⁰ To staff it, he drew heavily from former associates of his from the First World War. Among its founding officers was Seeckt's close associate, Fritz Tschunke, who had rescued Enver Pasha in Lithuania and served with Seeckt in Turkey. In addition,

²⁶⁸ Williams, p. 292.

²⁶⁹ Ibid.

²⁷⁰ Manfred Zeidler, *Reichswehr und Rote Armee, 1920-1933: Wege Und Stationen einer ungewöhnlichen Zusammenarbeit* [The Reichswehr and the Red Army, 1920-1933: Paths and Facilities of an Unusual Collaboration] (Munich: Oldenbourg Verlag GmbH, 1994), p. 54. There is a lot of disagreement about the actual date of the founding of this agency. Vourkoutiotis places it in early 1920 on the basis of a letter written by Fritz Tschunke in 1939; Zeidler places it in 1921 on the basis of the same letter. What can be said for certain is that the group was put together between Enver Pasha's visit to Russia in August 1920 and September 1921, when secret military negotiations between the two sides began.

Major Herbert Fischer, Seeckt's personal aide since early 1920, joined the group. Seeckt also included Major Wilhelm Schubert, the former military attaché to Russia.²⁷¹

Overseeing the activities of Sondergruppe R was Otto Hasse, who became *Chef des Truppenamt* [Chief of the Personnel Office, the secret successor to the German General Staff] in 1922.²⁷² These four officers were joined by one of the most colorful men in the German Army, Oskar von Niedermayer.²⁷³

A famous explorer and spy, Niedermayer liked to be called “the German Lawrence” in reference to Lawrence of Arabia.²⁷⁴ He had spent two years traveling across Asia while on paid leave from the military before World War I. After a brief stint on the Western Front, he was secretly dispatched to Afghanistan in December 1915. His mission was to raise the Afghans in a regional uprising against the British government. He returned to Germany in 1916 and saw combat on the Western Front. After the war, he completed his suspended studies, graduating with a D.Phil. in Central Asian geography. In 1919, he fought in the Freikorps of Ritter von Epp in Bavaria before rejoining the army. He would abruptly “resign” again in 1921 to participate in the activities of Sondergruppe R in Moscow.²⁷⁵

²⁷¹ Zeidler, p. 49.

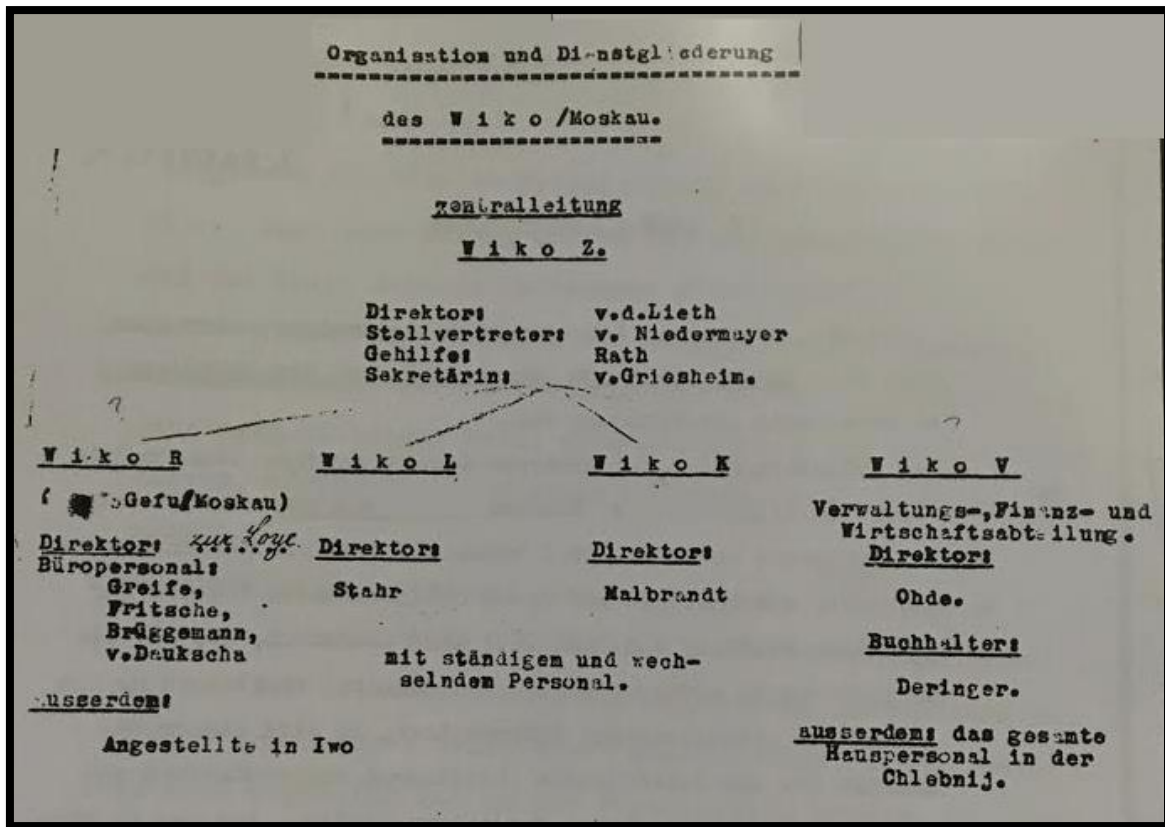
²⁷² Ibid, p. 54.

²⁷³ “Ritter Oskar von Niedermayer” in Gerd R. Ueberschär, *Hitlers militärische Elite: 68 Lebesläufe* (Zürich: Primus Verlag GmbH, 2011), pp. 78-84. The only major work on Niedermayer's career to date, besides Niedermayer's own writings, is Hans-Ulrich Seidt, *Berlin, Kabul, Moskau: Oskar Ritter von Niedermayer und Deutschlands Geopolitik* [Berlin, Kabul, Moscow: Oskar von Niedermayer and German Geopolitics] (Munich: Universitas Press, 2002).

²⁷⁴ Hilger, Meyer, p. 195.

²⁷⁵ Ueberschär, pp. 78-84.

Table 1 Moscow Center Organization Chart (1926)²⁷⁶



Niedermayer would remain in Moscow for most of the period between the summer of 1921 until 1932. Beginning in 1921, he established, under the management of Sondergruppe R, *Zentrale Moskau* [Moscow Center, or “Z”]. This was designed to manage all of the Reichswehr’s secret activities in Russia. Based out of an apartment very near the British Embassy, Niedermayer functioned at first as both an unofficial

²⁷⁶ Hermann von der Lieth Thomsen, “Organisation und Dienstgliederung des Wiko/Moskau [Organization and Operating Structure of WIKO/Moscow,]” June 4, 1926, RH2/2297, 137, BA-MA, p. 1-2.

military attaché and a supervisor of German efforts in Russia. Contrary to a number of historians – all of whom seem to be relying on Hilger’s memoirs – Niedermayer was not the director of Moscow Center after 1923.²⁷⁷ His adventurous personal behavior and tendency to overpromise apparently antagonized both Lenin and Chicherin.²⁷⁸ But Niedermayer’s presence was too valuable in Moscow to recall him, so Seeckt dispatched retired Air Force General Hermann von der Lieth-Thomsen to Moscow in November 1923 to supervise Niedermayer and “Z.” Niedermayer would stay on as deputy director from the fall of 1923.²⁷⁹ In addition to Lieth-Thomsen and Niedermayer, “Z” also included a personal assistant named Rath and a secretary, Frau von Griesheim.²⁸⁰ After 1926, Moscow Center was codenamed *Wirtschaftskontor Zentral* or *WIKO Z* [Central Economic Office] and almost always referred to as “Z” in secret German correspondence. Between 1922 and 1926, four additional WIKOs were established to manage the growing network of Soviet-German facilities. These were WIKO L, which would manage Soviet-German aviation cooperation; WIKO K, which would deal with armored warfare projects; WIKO V, which was the German “Administrative, Financial and Economics” office; and finally, WIKO R, which was to directly supervise all German military

²⁷⁷ He would take over again when Lieth-Thomsen grew ill and returned to Germany, but for the critical period from 1923 to 1928, he was second-in-command.

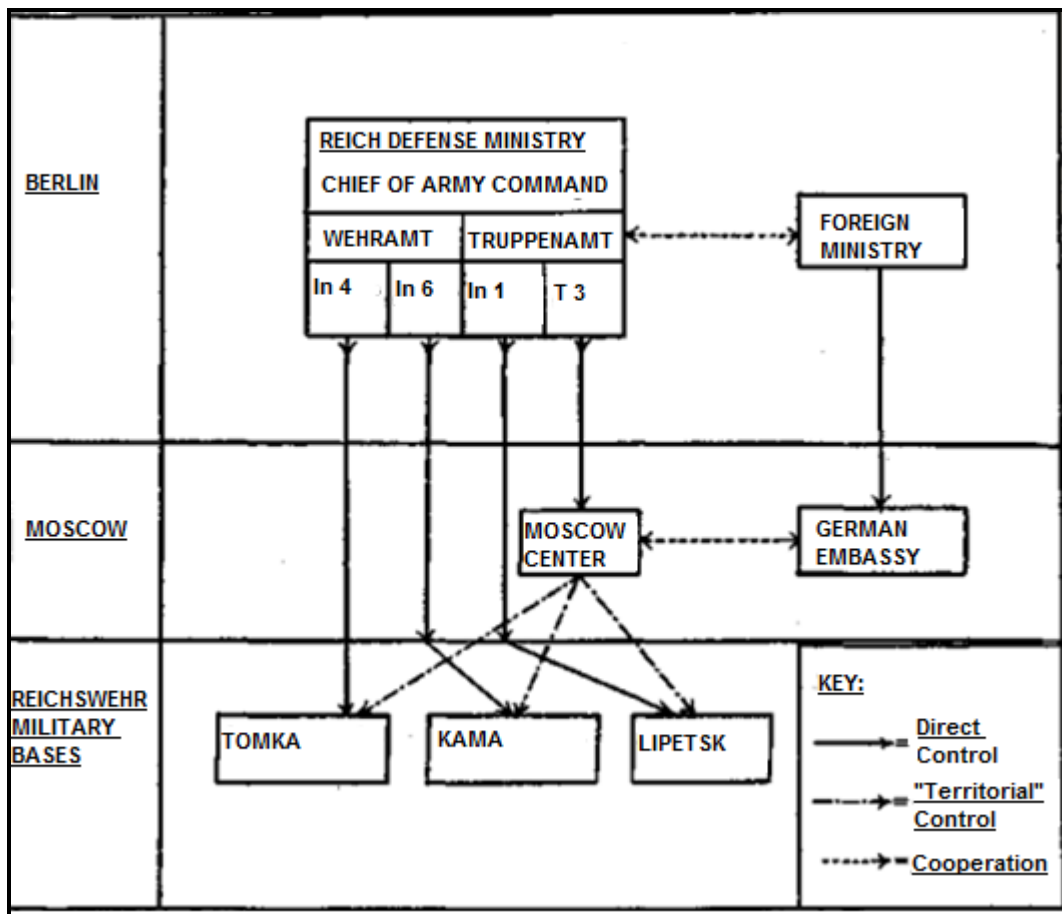
²⁷⁸ Vourkoutiotis, p. 126.

²⁷⁹ Thomsen, “Organisation und Dienstgliederung des Wiko/Moskau [Organization and Operating Structure of WIKO/Moscow],” p. 1-2. Lieth-Thomsen was among Germany’s early air warfare pioneers. He had resigned from the military in 1919, but was called back to head the Russian cooperative project; his involvement highlights that airpower was the focus of early exchanges. Indeed, between Fili and Lipetsk, the Luftwaffe of World War II was more or less created on Russian soil. Lieth-Thomsen spent a number of years in Russia before returning to Germany because of health issues. He reentered active service in 1935. Lieth-Thomsen had the good fortune to die peacefully at the age of 75 in 1942, shortly after being promoted to lieutenant general.

²⁸⁰ Thomsen, “Organisation und Dienstgliederung des Wiko/Moskau [Organization and Operating Structure of Wiko/Moscow],” pp. 1-2.

industrial projects in Russia.²⁸¹ It would also, through 1927, manage the Soviet-German chemical weapons program, as until that date, most of the scientists and researchers working on chemical weapons projects were hired via a private corporation, Stolzenberg AG.²⁸²

Table 2 Reichswehr Organizational Table for Russian Enterprises²⁸³



²⁸¹ Lieth-Thomsen, "Organisation und Dienstgliederung des Wiko/Moskau [Organization and Operating Structure of WIKO/Moscow,]" June 4, 1926.

²⁸² The story of that business will be provided in more detail in chapter three.

²⁸³ Speidel, p. 45.

*THE TREATY OF RAPALLO*²⁸⁴

Formal diplomatic relations between Germany and the Soviet Union would resume shortly after the establishment of Seeckt's secret agency in Moscow. In early April 1922, representatives from thirty-four countries began to arrive in Genoa, Italy, for a major economic summit. There were two major subjects to be discussed. The first was the possibility of shifting the major world economies back towards a gold standard, abandoned by most of the Great Powers under the financial pressures of the war. The other was to seek the reintegration of Russia, at least partially, into the global economy. Both Germany and Soviet Russian delegations were invited to attend the conference, the first time either state had been invited as an equal member of the international community to a summit of this sort. On April 10, the negotiations began, with the British and French pressing for the payments of Tsarist-era war debts and remuneration for property seized by the Soviet state. The Soviets would counter with offers for partial repayment of property losses in exchange for diplomatic recognition and vast credits with which to rebuild the Soviet economy. The head of the Soviet delegation, Georgy Chicherin, knew that the proposal was unlikely to be accepted.²⁸⁵ Instead, his major role at the summit was to avoid "the unification of the capitalist states into a single front."²⁸⁶ He also sought to gain legal recognition of the Soviet state, if possible.

²⁸⁴ For the most detailed analysis of the Genoa Summit (which included Rapallo), see Carol Fink, *The Genoa Conference: European Diplomacy, 1921-1922* (Chapel Hill, NC: University of North Carolina Press, 1993).

²⁸⁵ Fink, pp. 161-162.

²⁸⁶ Vourkoutiotis, p. 125. He did the former very cleverly by "bringing up the issue of disarmament," on which the British and French were split, as well as entering "into private negotiations with the British delegation for a settlement of debts and claims," but not the French. The latter would take more diplomatic finesse.

On their way to Genoa, the Soviet delegation had stopped in Berlin. Comprised of Chicherin, Radek, Joffe, Litvinov and Rakovsky, its members were familiar with both Germany and its senior diplomatic officials. While in Berlin, they pressed for an agreement to settle outstanding disputes of a diplomatic and economic nature between the German and Soviet governments. This included war claims levelled by each state against each other. The most important concerned the Treaty of Versailles' Article 116, which read "The Allied and Associated Powers formally reserve the rights of Russia to obtain from Germany restitution and reparation based on the principles of the present Treaty." It had been designed by the Allies to keep Russia and Germany opposed to each other through the issue of war reparations, and was an essential impediment to reestablishing formal diplomatic ties. During the Berlin visit, "negotiations took place in the German Foreign Office, and a draft text was agreed on all but two points of detail."²⁸⁷ The primary difficulty was German Foreign Minister Walther Rathenau's reluctance to make a deal with the Soviets, hoping instead for a better arrangement (particularly regarding reparations) with France and Great Britain at the planned Genoa Conference.

But it was not to be. The French proved entirely intransigent on the issue of war debt and reparations, and as a result, the German delegation would seek succor elsewhere. The diplomatic mission that travelled to Genoa included Germany's top statesmen, Chancellor Wirth and Foreign Minister Rathenau. Among its other members were Count Maltzan and as the Reichswehr's representative Colonel Otto Hasse, to whom Sondergruppe R reported. During the first five days of the conference, this group

²⁸⁷ Carr, p. 63.

achieved none of its objectives regarding reparations.²⁸⁸ The question of returning to the text of the Russo-German Treaty soon arose in curious fashion. At 1 am on Sunday, April 16, Adolf Joffe called the German delegation and suggested that both delegations slip out of Genoa to the nearby town of Rapallo to complete their treaty negotiations. At that early hour, “the principal members of the delegation assembled in their pyjamas in Rathenau’s bedroom, and debated the question to go or not to go to Rapallo.”²⁸⁹ Maltzan and Wirth were adamantly in favor and convinced the wavering Rathenau. After a brief, failed attempt to inform the British delegation of their intentions the next morning, the Germans departed for Rapallo. At 5 pm, Rathenau and Chicherin affixed their signatures to a final draft of the Treaty.

The Treaty of Rapallo contained six articles. There was nothing particularly remarkable in any of them. Yet collectively, the agreement would rock the European post-war order. The two states agreed to “waive their claims for compensation for expenditure incurred on account of the war” or for lost property, the immediate resumption of “diplomatic and consular relations,” and reestablish commercial ties on the basis of “most favored nation” status.²⁹⁰ Germany was the first capitalist state to formally normalize relations with the Soviet Union; both states thus escaped the isolation imposed by the international order in the aftermath of World War I.

²⁸⁸ Fink, pp. 162-163.

²⁸⁹ Carr, p. 64.

²⁹⁰ “[Rapallovertrag zwischen] Die Deutsche Regierung, vertreten durch Reichsminister Dr. Walter Rathenau und die Regierung der Russischen Sozialistischen Föderativen Sowjet-Republik, vertreten durch Volkskommissar Tschitscherine [Rapallo Agreement between the German Government, represented by Reich Minister Dr. Walter Rathenau and the Government of the Russian Socialist Federative Soviet Republic, represented by People's Commissar Tschitscherin],” April 16, 1922, p. 1.

Rapallo has generally been considered to mark the beginnings of Soviet-German military cooperation. One of the central historiographic debates on Soviet-German relations is the question of the “Secret Addendum” to Rapallo.²⁹¹ Six days after the conclusion of the Treaty of Rapallo, the London Times, soon followed by nearly every other major newspaper in Europe, began to print documents purporting to prove Germany and the Soviet Union had agreed to a secret military alliance against Poland.²⁹² Complicating the discussion is the fact that, as noted earlier, “incriminating documents were ‘regularly and systematically destroyed’” to hide the nature of the Soviet-German military relationship.²⁹³ It is clear that the London Times Treaty, which they reprinted in full and used to be cited as authentic by historians, is a forgery. Its language, the military provisions and the supposed signatories all make that clear.²⁹⁴ Hans von Seeckt also noted in a letter to Hasse in May 1922 that “no political-military agreements exist; however the possibility of their existence is believed. Is it in our interest to destroy this

²⁹¹ Strictly speaking, the German military had no reason to seek an official agreement with the Soviets in April. Seeckt had already rejected an offer for a military alliance against Poland in November and December 1921. The Germans had begun separate negotiations over military industrial cooperation more than a year before, some of which was nearly finalized. Indeed, Hasse’s presence at Rapallo was to continue negotiations with Radek and Chicherin regarding a deal with Junkers AG which had nearly been finalized during their earlier stay in Berlin. And while the economic provisions of Rapallo made such exchange easier, they were not written specifically for the military. Given the tremendous German reluctance to share anything with the civilian government at this juncture – Wirth alone of the civilian delegates had a vague general outline of German military activities in Russia – it seems unlikely they would seek to connect diplomatic and military negotiations. Simply put, they were not necessary. By 1922, Soviet-German military negotiations had already been ongoing for almost two years. They proceeded in a separate vein, without the knowledge or inclusion of the civilian government.

²⁹² Vourkoutiotis, p. 151.

²⁹³ Gordon H. Mueller, “Rapallo Reexamined: A New Look at Germany’s Secret Military Collaboration with Russia in 1922,” *Military Affairs*, Vol. 40, No. 3, p. 109.

²⁹⁴ The Russian signatories seem to be generic Russian names: neither name was on the Russian delegation at Rapallo, nor were such names among the senior ranks of the Red Army or NKID at the time. Further, much of the cooperation listed centers on naval relations; Admiral Behncke was not amenable to working with the Soviets, as explored in chapter six.

weak Nimbus?”²⁹⁵ He argued it was not, as the fear of Soviet-German rapprochement was a valuable card in dealing with the West.

While it is clear no military agreement was reached at Rapallo, the correspondence of Chancellor Wirth, Seeckt and Hasse all prove that one, or possibly two, supplemental treaties were agreed to with Soviet representatives during the summer of 1922. What did they contain? In an article written in 1976, Gordon Mueller argued that one of these treaties must have been a military agreement of some sort, with specific provisions regarding an alliance against Poland.²⁹⁶ He was the first to fully investigate the later writings of Chancellor Wirth, which did indeed hint that there was a military element to these later negotiations. Both Gorlov and Zeidler agree with this interpretation: the April version of Rapallo offered a psychological boost to military cooperation; it made the mutual military-industrial projects which would develop after 1922 far easier to manage.²⁹⁷ The later negotiations held in Berlin in July were the first towards a military convention, a sort of “statement of intentions.”²⁹⁸ The first piece of evidence concerns the negotiators present at the July Conference. On the Soviet side was

²⁹⁵ Vourkoutiotis, p. 151.

²⁹⁶ Gordon H. Mueller, “Rapallo Reexamined: A New Look at Germany’s Secret Military Collaboration with Russia in 1922,” *Military Affairs*, Vol. 40, No. 3 (Oct. 1976), pp. 109-117. What may be most interesting about Mueller’s article is the fact that it shows the German government, as early as 1921, was not pursuing rapprochement with the West in good faith. Wirth, who was informed to a reasonable degree about the ongoing military negotiations with Russia, implied later that not only did the negotiations have his full support, but that he played a role in driving them forward. It is clear that Stresemann, famous as Germany’s best statesman in the interwar era, was similarly supportive of secret cooperation with the Soviet Union. Weimar’s leading politicians –tarred and feathered by the Nazis as traitors and lapdogs of the British and French – appear instead to have been the architects of a long-term strategy designed, if not to start another war, reequip Germany for future conflict and possibly resolve its border disputes to the East by force. Wirth, who found himself in a dangerous position under the Nazis, defended himself on exactly those grounds in 1940.

²⁹⁷ Zeidler, pp. 68-70.

²⁹⁸ Gorlov, p. 65.

Arkady Rosengoltz, who simultaneously held appointments with the Commissariat for Trade and with the RVS. Beginning in 1922, he was tasked with managing Soviet-German military cooperation. On the German side, Seeckt's right hand and head of Sondergruppe R, Otto Hasse, led the negotiations.²⁹⁹ The next hint of the content of this agreement is the timeline of events after July 1922: two weeks later, Seeckt dispatched his personal aide, Major Herbert Fischer, to Moscow, where a secondary agreement was reached.³⁰⁰ Official military cooperation, involving the exchange of officers and the dispatch of a larger German contingent to Moscow, began in November 1922.³⁰¹ It seems that the July and August meetings laid the framework – written or unwritten – for future cooperation. The Soviet-German military pact can be said to have been born amid the “Spirit of Rapallo.”

CONCLUSION

The origins of both the Reichswehr and Red Army bore many of the same marks: the scars of defeat, disintegration and disunity, rebirth amid the horrors of civil war, and years of political consolidation. The early crises of the November Revolution in Germany left an indelible imprint on the young Reichswehr. The army was transformed in an overtly political way through the dissolution of the army and its rebirth via the medium of the *Freikorps*. Like the Red Army, the new German officer corps was at odds with the government which they served, loyal instead to a different concept of the nation. The

²⁹⁹ Gorlov, pp. 65-66.

³⁰⁰ Ibid, p. 65.

³⁰¹ Ibid, pp. 65-66.

limitations on size made the Reichswehr easier to unite in political terms than the Red Army.³⁰²

Soviet leadership saw themselves as under siege. They had emerged from the Civil War with a nation in ruins. A quarter of the country's farmland was no longer under cultivation. The country's largest cities had emptied under the pressures of war. More than a million bureaucrats and technical experts had fled the murderous new regime.³⁰³ 7.5 percent of the Russian Empire's prewar population had died violently between 1914 and 1921. Famine was rife. Industry had collapsed. The army itself was ideologically suspect after the Civil War. Further, the Soviet Union's ideological orientation made it incapable of forming the alliances that had been the best guarantee of Russian security over the preceding several centuries of European history.

The German security situation was little better. The unstable Weimar government drifted from crisis to crisis. The KPD constantly threatened revolutionary violence, with numerous uprisings spreading disorder and death between November 1918 and October 1923. Large paramilitary organizations run by different incompatible political factions roamed Germany's streets. The army had launched a coup in 1920 and openly discussed two others in 1919 and 1923. The terms of Versailles made long-term alliances with any of the victorious powers impossible. Further, Germany's contested borderlands, particularly with Poland, created antagonisms on all sides. Like the Soviet Union,

³⁰² Yet in the end, the shattering of that consensus – based on the principles of the old army brought down Weimar government in. Armed with the instruments of oppression, the Soviet state avoided a similar fate through first creating the commissar system, and then, developing a new, “proletarian” officer corps commissars. Stalin apparently still had his doubts, which the Great Purge allayed.

³⁰³ Ziemke, p. 135.

Germany was not capable of the alliances perceived by its leaders as fundamental to long-term stability and security.

It would be a combination of economic and technological needs which first drew the two states together in the immediate aftermath of World War I. But there was a broader strategic connection, a tenuous hope vested in each other. Within the militaries of the respective states, there was a vision shared that their mutual cooperation, however limited in scale, offered the end of isolation. The Germans cast the Soviet Union as a potential ally in their war games against Poland and France, where they offered the only real hope to Germany of military or diplomatic victory. For the Soviets, the Germans were a technological lifeline to the West, and perhaps, someday, a partner in the revolution. Together, over the following eleven years, they would arm each other for the next war.

CHAPTER TWO – CAPITALISTS AND COMMISSARS: THE ORIGINS OF
SOVIET-GERMAN CORPORATE COOPERATION

INTRODUCTION

On December 3, 1926, residents of Manchester, England, awoke to a startling, seven-line headline in the *Manchester Guardian*: “Cargoes of Munitions from Russia to Germany! Secret Plan between Reichswehr Officers and Soviet[s]. STARTLING DISCLOSURES. Military Intrigues to be stopped by German Government.”¹ This was not the first time that Germany had been accused of undermining Versailles through secret rearmament, but the *Manchester Guardian* revelations were exceptional for the amount of evidence they produced to support their claim. The Guardian’s foreign correspondent alleged that

An aeroplane factory has been built by Junkers’ Works in Russia for the purpose of manufacturing military aeroplanes for German as well as Russian use. Arrangements for erecting chemical works in Russia to manufacture poison-gas for both countries were also made by German and Russian military experts. These activities began at least five years ago, but have been going on ever since. To make the necessary arrangements, officers of the Reichswehr have travelled to and from Russia with false papers, visa’ed by the Russian authorities. General von Seeckt, until recently Commander-in-Chief of the Reichswehr, was on the best of terms with the Russians, particularly with officers of high rank in the Soviet army.²

Every word was true. Beginning in 1920, the German Army had embarked on an audacious plan to relocate critical war industries to Russia, which would supply the

¹ “Cargoes of Munitions from Russia to Germany,” December 3, 1926, *Manchester Guardian*, R 31493 K096972, PA-AA, p. 1.

² *Ibid*, p. 1.

German Army in the event of war.³ Many of Germany's largest industrial firms were involved in the program, which had one goal: undermine the Treaty of Versailles and render Germany capable of launching a new conflict.

Soon after the December 3 *Manchester Guardian* article, German headlines followed: "Russia and the Reichswehr. New Revelations from the Manchester Guardian: the Agreement with Junkers."⁴ Another read: "Reichswehr officers with false Passports in Soviet Russia. Moscow against Stresemann, the German Nationalists – and for Seeckt!"⁵ Only *Rote Fahne [Red Banner]*, the German Communist Party's paper, decried the story: "The Social Democrats throw 'lie grenades' against the Soviet Union."⁶ This non-denial by the KPD's paper seemed to confirm in the minds of many this seemingly impossible partnership between the arch-conservative German officer corps and the revolutionary leaders of the Soviet Union.⁷

The question of secret rearmament would soon bring down the German government. The Reichstag had been made aware of the allegations before the news story broke. Indeed, the Guardian's German correspondent based his report upon on a document provided to every member of the Reichstag and passed to him by a socialist elected official. Its author was a disgruntled German industrialist, Hugo Junkers, whose

³ The article stated that an arrangement had even been reached whereby the German Army guaranteed they would not use such weapons against their own country's working classes.

⁴ "Russland und Reichswehr," *Vorwärts*, December 7, 1926, R31493K- K096979, PA-AA, p. 1.

⁵ "Sowietgranaten für Reichswehrgeschütz," December 5, 1926, *Vorwärts*, R31493K-K096979, pp. 1-2.

⁶ "Sozialdemokratische Lügengranaten gegen Sowjetrussland," December 7, 1926, *Rote Fahne* R 31493 K-K096987, PA-AA/, p. 1.

⁷ Indeed, the Guardian's correspondent noted that the silence of the KPD in the Reichstag and in their printed materials – a product of their "abject servility to Moscow." "Cargoes of Munitions from Russia to Germany," December 3, 1926.

business had been ruined in Russia.⁸ Amidst the firestorm of recriminations that followed, the Social Democrats demanded the resignation of Chancellor Wilhelm Marx, which he duly proffered on December 17, 1926.⁹

The news shocked the rest of the continent, too: many in the west had begun to believe that the Weimar Republic had abandoned the militarist past of Prussia and the German Empire. But now, the newspapers proved that Germany was rearming. Chancellor Marx forced General Hans von Seeckt to resign in October 1926 for an incident involving a German Grand Prince attending military maneuvers.¹⁰ Had he remained in office a month longer, the unfolding Junkers scandal would have undoubtedly cost him his position anyways.

The overall crisis seemed to derail all of the Reichswehr's grand plans of rebuilding the German military on Soviet soil. Seeckt had envisioned a vast cooperative program whereby German industry would relocate en masse to Russia, there to build the factories that would supply Germany's future war efforts. From 1922 until 1926, under the umbrella of Sondergruppe R, German businesses reached agreements with the Soviet Revolutionary Military Council to refurbish, rebuild or establish new factories in the Soviet Union. Lenin, who had supervised this aspect of Soviet-German cooperation much more closely than the others before his health failed, was a particularly keen advocate of

⁸ Haigh, Morris, Peters, p. 171.

⁹ Hilger, Meyer, p. 203. He would almost immediately return to office thanks to the inability of the other parties in the Reichstag to form a suitable coalition without Marx's Center Party.

¹⁰ Seeckt had ostensibly resigned over allowing a member of Hohenzollern Royal Family attend military maneuvers without permission from the Minister of Defense. However, the odd timing of the resignation and the Minister of Defense's acceptance of Von Seeckt's resignation over this relatively trivial matter suggested that the unfolding Junkers scandal was the real cause of his removal from office. "Von Seeckt Resignation Accepted," *The Brisbane Courier*, October 11, 1926.

the partnership. But the scandal which exploded in December 1926 threatened to wreck the plans of both the Reichswehr and the Red Army.

SOVIET-GERMAN ECONOMIC RELATIONS BEFORE RAPALLO, 1918-1922

As soon as Trotsky signed the Treaty of Brest-Litovsk, the Soviet government began to pursue economic assistance from German businesses. Among the bewildering array of special committees, departments and directorates initially established by the Bolsheviks in 1918, three – the People’s Commissariat of Trade and Industry (NKTiP), the People’s Commissariat of Foreign Trade (NKVT), and the People’s Commissariat of Ways of Communication (NKPS) – began to explore the possibility of trade with Germany to gain desperately needed equipment and supplies.¹¹ In particular, the new revolutionary government hoped to alleviate severe coal shortages that gripped St. Petersburg. In the summer of 1918, Leon Trotsky persuaded Leonid Krasin, a Russian engineer who had worked for a number of years in Germany, to end his self-imposed exile in Sweden and assist in the negotiations at Brest-Litovsk.¹² After the negotiations,

¹¹ Anthony Heywood, *Modernizing Lenin’s Russia: Economic Reconstruction, Foreign Trade and the Railways* (Cambridge: Cambridge University Press, 1999), p. 28, pp. 63-67.

¹² A little background on Krasin helps to illustrate his unique position between Germany and the Bolsheviks. Krasin was born in Siberia in 1870, the son of the local police chief in Tyumen’. His family had enough wealth and connection to send him to an engineering program in St. Petersburg, where he proved a good student. While in the turbulent capital, he became close friends with a group of dedicated Marxists, one of whom was Lenin’s future wife, Nadezhda Krupskaya. Following university, Krasin went to prison several times, was exiled once, worked on the Transsiberian Railroad, briefly served in the military, and proved a brilliant engineer in redesigning oil wells in the Caucasus. While working as an engineer, he set up one of the most successful illegal Marxist presses in the country. He also masterminded a number of daring bank robberies and built bombs to assassinate Prime Minister Pyotr Stolypin, which led to his prominence within the Bolshevik wing of Social Democratic Labor Party. By 1912, Krasin was the primary banker and fundraiser for the Bolshevik Party. However, a secret falling out with Lenin led him away from politics for a time; he gave up revolution and went to work as an engineer in Germany. “Avtobiograficheskie Dannie, Leonid Krasin [Autobiographical Information, Leonid Krasin],” February 22, 1927, 137-1-34, l. 6, RGASPI, pp. 1-2. There is a good secondary literature on Krasin and his role in

Krasin became a central conduit between the various Bolshevik bureaus and the German business community.¹³ By March 1919, the Central Committee had appointed Krasin the head of NKTiP as well as NKPS; in this dual role, he supervised much of Russia's foreign trade with Germany.¹⁴ But this slow movement towards normalization brought little in the way of economic relief for either state, and would soon collapse as the war approached its end. It was through Krasin that Bolshevik Russia negotiated its first commercial treaty with Germany.¹⁵

While the Soviets needed German manufactured goods, technical expertise and a market for raw materials, German industry sought to regain its once-dominant place in the Russian market. The Treaty of Versailles had forced Germany to accept the victorious powers as "most favored nations" in trading relations, handicapping German businesses in their effort to compete in France, Great Britain and America.¹⁶ Further, Allied occupation forces, particularly the French, had confiscated patent and technical information from dozens of "military industry plants," using the broadest definition the

early Soviet- German relations. See, for instance, Michael Glenny, "Leonid Krasin: The Years before 1917, An Outline," *Soviet Studies*, Vol. 22, No. 2 (Oct., 1970), pp. 192-221, or Timothy O'Connor's *The Engineer of Revolution: L.B. Krasin and the Bolsheviks, 1870-1926* (New York: Westview Press, 1992).

¹³ "Protokol № 36, Zasedaniya Politicheskogo Byuro TSK ot 13 avgusta 1920 g. [Minutes from meeting No. 36 of the Political Bureau of the Central Committee on August 13, 1920]," August 13, 1920, 17-3-102, L. 1. RGASPI, l. 2 "Avtobiograficheskie Dannie, Leonid Krasin [Autobiographical Information, Leonid Krasin]," p. 2.

¹⁴S.S. Khromov, *Innostrannie Kontsessii v SSSR: Istoricheskii Ocherk. Dokumenti, Chast I* (Moscow: Rossiiskaya Akademiya Nauk Institut Rossiiskoi Istoriii, 2006), p. 14. Krasin handled nearly all of the early concessionary negotiations.

¹⁵ Martin Lutz, "L.B. Krasin und Siemens: Deutsch-sowjetische Wirtschaftsbeziehungen im institutionenökonomischen Paradigma," *Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte*, 95. Bd., H. 4 (2008), pp. 391-409; 391-392. His personal relationships with Siemens, where he had been employed, proved to be a vital ingredient in early economic relations between the two states.

¹⁶ Manfred F. Boemeke, Gerald D. Feldman, *The Treaty of Versailles: A Reassessment After 75 Years* (Cambridge, UK: Cambridge University Press, 1998), pp. 384-385.

word.¹⁷ As a result, traditionally world-leading German industries like dyes faced far greater international competition than they had before the war. As the Soviet Union organized its concession policy to draw in foreign investment, German businesses sought to create their own framework for investment in Russia. They were aided by aggressive (particularly American) capital investment in Germany after the war: net capital inflows totaled 44.7 billion gold marks (1931 value) from 1919 to 1931, more than Germany sent to the Allies in reparations.¹⁸

Before the First World War, German industry and banking had been heavily invested in Russia. In 1913, Germany was Russia's largest trading partner.¹⁹ Private German corporations had active investments worth 400 million rubles of capital in Russia by 1914.²⁰ The previous year, Russia exported 356 million rubles worth of materiel to Germany, and imported more than 510 million; Great Britain, Russia's second biggest trading partner, accounted for only 136 million in imports and 210 million in exports.²¹ Russia was a critical market for German goods before the war, second only to Austria-Hungary in the value of its imports from Germany. German trade during the Weimar

¹⁷ Diarmuid Jeffreys, *Hell's Cartel: IG Farben and the Making of Hitler's War Machine* (New York: Metropolitan Books, 2008), pp. 98-103.

¹⁸ Stephen A. Schuker, *American "Reparations" to Germany, 1919-33: Implications for the Third-World Debt Crisis* (Princeton University: Princeton Studies in International Finance Publication Series, 1988), pp. 111-119.

¹⁹ Germany was the Russian Empire's largest trading partner as measured by direct import and export of goods. France and Great Britain had more capital invested in Russia than Germany in 1913-1914, but less direct trade. German capital investment figured third.

²⁰ John P. McKay, *Pioneers for Profit: Foreign Entrepreneurship and Russian Industrialization, 1885-1913* (Chicago: The University of Chicago Press, 1970), 33. McKay notes that German businesses were particularly heavily invested in engineering, manufacturing and electrical equipment, areas of particular Bolshevik interest. This doubtless contributed to Russian interest in seeking renewed ties with German corporations.

²¹ B.R. Mitchell, *International Historical Statistics: Europe, 1750-2000* (New York: Palgrave Macmillan, 2003), p. 645.

period reoriented away from Russia in the early 1920s. The damage of the Russian Civil War and the policies of the Bolsheviks so ruined the Russian economy that Soviet foreign trade would not approach the level of 1913 until after World War II. For this reason, and also because of the impositions of Versailles, German businesses turned instead towards the United Kingdom, the United States, the Netherlands and France. However, commerce with Russia did begin to grow again when the Russian economy recovered somewhat during the NEP period (1921-1928). The Soviet regime was enthusiastically committed to industrialization, and its extensive raw materials beckoned. Some German firms were thus lured towards investment in the Soviet Union.

As Adam Tooze has argued, the Weimar state was much more interventionist economically than its Wilhelmine predecessors.²² The economic chaos of the war made it clear that Germany needed stronger central economic institutions.²³ The process of forming coherent national economic policy became evident especially after the inflation crisis ended in November 1923 with the introduction of the *Rentenmark*. However, it was the *Reichswirtschaftsministerium* (Reich Ministry of the Economy, or RWM), formed in 1917 and empowered in 1919 by the new Republic that signaled the real beginnings of centralization of economic policy. The ministry worked alongside the Reichswehr and German companies in encouraging German economic activity inside Russia. This meant that German business had unprecedented government assistance in pursuing foreign trade. The most important of the Reichswirtschaftsministerium activities was a series of

²² J. Adam Tooze, "Weimar's Statistical Economics: Ernst Wagemann, the Reich's Statistical Office, and the Institute for Business-Cycle Research, 1925-1933," *The Economic History Review*, New Series, Vol. 52, No. 3 (Aug., 1999), p. 525.

²³ *Ibid.*

large credit offerings provided to the Soviet Union in exchange for future deliveries of grain and raw materials.²⁴ These credits were advanced on the understanding they could only be used to buy German industrial goods. The first, in 1923, provided half the value up front for 328,000 tons of grain. The next, in 1925, provided 100 million Reichsmarks in credit. The success of both of these ventures led to a much larger offering of 300 million Reichsmarks in 1926. In 1928, the 300 million Reichsmarks credit was renewed and turned into a revolving credit, dependent upon Soviet payment of 8.5 percent interest per annum.

In June 1919, some four months after Radek's arrest, railway engineer Yuri Lomonosov arrived in Sweden. He had formerly been a diplomatic representative of the pre-Bolshevik provisional government.²⁵ Sent to the United States to negotiate the purchase of railway cars in 1917, shortly after his arrival he found his official position terminated by the October Revolution.²⁶ He spent almost two years abroad before returning to Russia, using the intervening time to make contacts in the foreign rail industry and diplomatic circles; these included diplomats in the German Foreign Ministry.²⁷ Through unofficial contacts, a Bolshevik sympathizer solicited his advice on potential rail purchases when he arrived in Stockholm. Like Krasin, Lomonosov was rapidly drawn into official circles.

²⁴ Hilger, Meyer, pp. 184-186, p. 239. Hilger had intimate knowledge of these activities as he managed German business liaisons with the Russian government while working at the Moscow Embassy.

²⁵ For more on Lomonosov, see Anthony Heywood's excellent biography, *Engineer of Revolutionary Russia: Iurii V. Lomonosov (1876-1952) and the Railways*, (London: Ashgate Publishing, 2011).

²⁶ Heywood, p. 71.

²⁷ *Ibid*, p. 70.

In August 1919, Lomonosov secretly traveled to Germany and began negotiations for the sale of locomotives by German industry. The first meeting, surreptitiously held with a junior member of the Foreign Ministry in a club for gentlemen called “The Berliner,” demonstrated German interest in renewing trade ties with Russia. By the end of August, Lomonosov had arranged a meeting with the Director for the Department for Trade Policy, Karl von Stockhammern.²⁸ Afterwards, Lomonosov sent a memorandum back to Krasin detailing his gains: Stockhammern had indicated the German government, in the post-Versailles landscape, was eager to establish close economic ties with the Soviet state; however, the presence of Allied Forces occupying the Rhineland limited Germany’s freedom of action. Stockhammern granted Lomonosov permission to discreetly place orders for railway equipment with German firms, and informed him that by February 1920, Germany might have greater flexibility to pursue an expansion of trade relations.²⁹

While the Soviets directly approached individual German companies, the major firms with interest in working with Russia sought to organize themselves. With the support of *Reichswehrministerium* [The Reich Defense Ministry], German industrialists and political leaders gathered in Berlin in September 1919 to discuss the possibility of forming a joint venture to pursue economic cooperation with the Soviet Government.³⁰ Krupp AG was among the first to show interest in this “German Society for the East.”³¹ A lecture at this event by Russo-German engineer Wilhelm Rothert on September 11,

²⁸ Heywood, p. 71.

²⁹ Ibid, p. 72.

³⁰ Wilhelm Rothert, “Letter to Krupp AG in Essen,” September 14, 1920, WA/41/4, 611/435, KA, p. 1.

³¹ Ibid.

1919, laid out the conditions whereby German industry could again profitably work in Russia.³² He began by saying that the most logical terms for the return of German industry to Russia would involve the exchange of finished goods for gold or Russian goods, not for the unstable ruble. Rothert also noted that since the Bolsheviks had eliminated all trading partners within Russia besides the state, German business needed to form a large holding company through which all their trade with the East could be standardized and protected.³³ This idea would take form in a number of *Verbände*, or large industry consortiums which would negotiate huge sales to the Soviet government. In the end, German business would follow this suggestion, forming huge trading companies to deal with the Soviet regime. For instance, the “Verband of German Locomotive Building Companies” would arrange the sale of 700 German locomotives and (with an English company) the sale of 1000 oil tanker cars in 1922 alone; those two contracts were worth more than one hundred million gold rubles, or 37 percent of *all* Russian imports in 1922.³⁴

But in 1920, those sorts of deals were impossible to organize. The logistics and international situation made large-scale trade only a prospect for the future. Dispatched again by Krasin, Lomonosov arrived in Germany in October 1920 with authority to purchase rail components and locomotives. But there was a problem: German banks refused to handle transactions in Russian gold, because they feared penalties for violating the Entente’s commercial blockade against Soviet Russia, which included specific

³² Rothert, “Letter to Krupp AG in Essen,” September 14, 1920, pp. 1-3.

³³ *Ibid.*

³⁴ Heyward, pp. 216-217.

measures on the transfer of gold.³⁵ A complicated exchange ensued whereby Swedish banks would pay Swedish Krona for Russian gold at a discounted rate, and then transfer the money to German banks before handling the transportation of the locomotives back to Russia.³⁶ With considerable assistance from the German government, Lomonosov exchanged 20 tons of Russian gold for Swedish currency, with which he signed several purchase agreements: one, on October 17, 1920, to buy spare parts from German and Swedish manufacturing firms, and a second, much larger contract, on October 21 to purchase 100 locomotives.³⁷ The Krupp Corporation, guided into its advantageous position by the German Foreign Ministry, proved the big winner. Krupp earned contracts for the production of 7,000 tons of locomotive tires and the lion's share of the locomotives.³⁸ The success of the deal, and the energy with which the German government had aided Lomonosov in overcoming the barriers to exchange, encouraged future dealings, particularly between the Russians and the Krupp Corporation.

A number of major contracts followed; Krupp, the Locomotive *Verband*, Henschel, Dortmund Union, Mannesmann, and Rheinmetall AG received contracts worth more than 233 million Swedish Crowns between April 1920 and the signing of the Treaty of Rapallo.³⁹ Encouraged by these successes, in November 1921 executives at A.E.G,

³⁵ This was the only provision still being enforced by the Entente powers from the earlier commercial blockade on Soviet Russia. Norbert H. Gaworek, "From Blockade to Trade: Allied Economic Warfare Against Soviet Russia, June 1919 to January 1920," *Jahrbücher für Geschichte Osteuropas, Neue Folge*, Volume 23, Issue 1 (1975), pp. 39-69, p. 67.

³⁶ Heyward, p. 132.

³⁷ *Ibid.*

³⁸ At Lenin's insistence, German industry was requested to spread out the orders of locomotives among 17 different factories, ostensibly to increase good feelings among workers for the Soviet regime. Heyward, p. 134. Technical note: locomotive tires are replaceable steel rings that are mounted on train car wheels, thus save the expense of having to replace an entire wheel.

³⁹ Heyward, 211.

HAPAG AG, Zeppelin and a number of other aircraft and dirigible manufacturers met to discuss the possibility of forming their own Verband to market – and possibly produce – their products in Russia. In 1921, it was difficult to distinguish civilian and military aviation. Thus, this was more dangerous ground than the railroad purchases, as German industry was banned from manufacturing warplanes.⁴⁰ But the companies pressed on. They agreed to terms among themselves in early November 1921, specifically noting that their organization, named “Aero-Union,” was to be made up of those “companies that have an interest in the development of German aviation.”⁴¹ By the end of 1921, Siemens, Schuckert and Daimler (through one of Daimler’s subsidiaries) would also join.⁴² Thus, by the end of 1921 a large number of Germany’s top businesses were ready to seek accommodations with the Soviet government in both military and civilian industrial projects. But there remained problems about property rights, trade protections, the role of the German government, financing and the outstanding war claims held by Soviet Russia and Germany against each other. The Treaty of Rapallo helped to provide that much needed clarity, paving the way for a future expansion of German-Soviet trade. The provisions added in August 1922 would initiate another type of economic partnership.

THE SOVIET CONCESSIONS SYSTEM

While the German industrialists organized Verbände to maximize negotiating power and minimize risk with the new Bolshevik regime, similar organizational measures

⁴⁰ “Aero-Union AG,” Box 167, 24 November, 1921. Archiv Daimler Benz, Stuttgart (ADB), pp. 1-5.

⁴¹ Ibid.

⁴² “Archivist’s note,” Box 28/29, June 3, 1970, ADB, p. 1.

were underway in Moscow. To encourage investment in both military and civilian sectors of the Soviet economy, Lenin formulated a new institution for foreign investment which would play a major role in Soviet-German economic relations. In the aftermath of the Russian Revolution and the Civil War, the new Soviet state had lost much of Russia's industrial plant, capital and expertise. As early as May 14, 1918, Lenin and representatives from Vesenkha (VSNKh, or the Supreme Soviet of the National Economy) discussed the possibility of granting "concessions" to foreign firms. They envisioned offering leases without property rights to foreign firms for assistance in developing Soviet industry and resource exploitation.⁴³ On 25 March, 1920, Lenin affixed his signature to "Theses of the Presidium of Vesenkha on Concessions," which argued that offering concessions to foreign companies was a form of state capitalism necessary, under close supervision, "for the restoration of transportation, mining, manufacturing and industry and the satisfaction of many immediate needs."⁴⁴ Lenin would later write that "the concession system of state capitalism is a tribute to capitalism itself. But [in doing so] we gain time, and to gain time to win means everything."⁴⁵ The most exciting prospect, argued Lenin, involved offering raw material concessions to German firms in order to acquire machine tools and industrial plant.⁴⁶ The legal basis for

⁴³ "Thezisi Prezidiuma VSNKh o Konsessiakh," 25 March, 1920, 5-1-2694, L. 2-3, RGASPI. Reprinted in Khromov, pp. 117-121.

⁴⁴ Ibid. This document specifically states interest in American capital. But Germany would soon come to dominate the concessionary system.

⁴⁵ Khromov, p. 11.

⁴⁶ M.V. Klinova, *Gosudarstvo i Chastnyy Kapital v Poiskakh Pragmatichnogo Vzaimodeystviya. [The State and Private Capital Searching for Pragmatic Cooperation]* (Moscow: Imemo Ran, 2009), pp. 41-42.

such projects was formed on November 16, 1920, with the organization of a concessionary commission headed by Lenin himself.⁴⁷

The concession was “an agreement between the Soviet state and a foreign enterprise by which the state leased to the enterprise land, industrial or other plant, fixed assets, shared in the profits and determined its business relations...” while leaving the management of the plant to the concessionaire.⁴⁸ The contracted firm also agreed to import the most advanced available technology to maximize production at the plant. There were two other contractual systems used with firms from capitalist states that the Soviet state usually listed as “concessionary.” These were the *mixed company* and *technical aid contracts*.⁴⁹ The former was a joint stock company whose shares were divided between the Soviet state and private companies. The Soviet state usually maintained a majority of the shares, and participated by sending representatives to the managing board. This system was used primary in trade and transportation. Technical aid contracts were one-time agreements with individuals or firms to supply expertise; when made with foreign companies these were generally handled as concessions. Technical aid contracts came in the form of patents, license agreements, or the “leasing” of technical experts like engineers.

The Council of People’s Commissars (SNK) signed the first concession agreement on July 21, 1921 for the construction and repair of telegraph lines.⁵⁰ The

⁴⁷ Khromov, p. 11.

⁴⁸ A. Köves, “Chapters from the History of East-West Economic Relations,” *Acta Oeconomica*, Vol. 17, No. 2 (1976), pp 159-176, p. 159-160.

⁴⁹ Köves, p. 160.

⁵⁰ Khromov, p. 236.

second, a month later, was a much larger agreement offering a near monopoly on Russian-German overland trade to *Derutra*, a German-Russian Trading firm formed in conjunction with the *Hamburg-Amerikanische Packetfahrt-Aktien-Gesellschaft* (HAPAG) shipping company.⁵¹ The largest German-Soviet mixed company was formed the next year. Named *Russgertorg* (the Russian-German Trading Company), its shares were divided between Otto Wolff AG and the Soviet state. The Soviets “determined the nature of the imports” and coordinated the delivery of exports, which the Germans provided 1.25 million British Pounds Sterling of credit and handled other day-to-day management issues.⁵² Within twelve months of its creation, *Russgertorg* was handling 20 percent of all Soviet trade.⁵³ *Russgertorg*’s stunning financial success helped encourage a wave of capital investment in Soviet industry and resource exploitation.⁵⁴

Non-technical aid concessionary agreements were the largest source of foreign economic assistance from 1921 to 1928. Of all the concessionary agreements sought in the Soviet Union by foreign businesses in 1922, nearly 39 percent were of German origin.⁵⁵ Until the first Five Year Plan shifted concessionary agreements away from leases and foreign management towards technical aid contracts, German businesses

⁵¹ Khromov, p. 236.

⁵² Antony C. Sutton, *Western Technology and Soviet Economic Development, 1917-1930* (Stanford, CA: Hoover Institution on War, Revolution and Peace Press, 1968), pp. 272-273. Sutton’s work has been regarded, rightly so, as increasingly controversial. While this early monograph is generally considered reliable, I have here relied on his work only when it clearly cites German Foreign Ministry archival records or published Soviet document collections.

⁵³ Sutton, p. 273. In fact, it was so successful that by 1925, the Soviet state viewed it as a threat to the economic independence of the Soviet Union and began shifting its responsibilities to state organs.

⁵⁴ Haigh, Morris, Peters, pp. 172-173. Shortly after *Russgertorg*’s foundation (October 1923), former chancellor Wirth became involved with a massive timber concession in Russia that managed more than two million acres of timberland. There was something of an air of impropriety about that particular arrangement and the way in which it was negotiated.

⁵⁵ Khromov, p. 17.

dominated foreign trade, resource extraction and industrial concession contracts with the Soviet Union. Areas of particular German penetration included coal mining, refinery production, metalworking, rolling mill construction, manganese mining, asbestos mining, lumber milling, agricultural and seed-farming concessions, paper mill construction, aircraft manufacturing, railroad repair and construction and above all, chemical industry.⁵⁶

Military concessions were even more heavily tilted towards German firms than non-military contracts. Between 1921 and 1933, the Red Army negotiated 526 concessionary or technical aid agreements.⁵⁷ Of those, 255, or 48.5 percent, were with German firms.⁵⁸ The next largest figure is for French firms, with 14.6 percent of all contracts. That orientation towards Germany was even more pronounced before 1928. German companies were lured in by the promise of long-term leases, partial Russian repayment of pre-war investments and loans and by the financial backing of the German state. All in all, German business invested tens of millions of rubles worth of capital annually in the Soviet economy between 1921 and 1928.⁵⁹ The concession system insulated the Soviets politically: should something politically controversial (i.e., offensive chemical weapons, or German military manufacturing) be found under production at a concessionary site, it could simply be blamed upon the concession-holder. In addition,

⁵⁶ Sutton, pp. 272-273.

⁵⁷ Not all of these were finalized: the RGVA contained lists of 526 contracts filed between 1921 and 1933, but not all of them were signed by both sides.

⁵⁸ "Archivist's Note," 1933, 31863-1, RGVA.

⁵⁹ Concessionary investment in 1925 totaled 32.6 million gold rubles; in 1926, that figure was 48.8. (E. Kantinik-Ulina, "Kharakteristika Raboti Sushchestvyushchikh Kontsessii," 26 November 1926, 8350-1-512, l. 312-317, GARF; reprinted in Khromov, pp. 284-288.

the system allowed the Soviets to isolate capitalist activity from the general public while directing it towards their own ends. Unfortunately for those involved, the system generally failed to turn a profit in the harsh economic environment of the 1920s Soviet Union, and as a result, fewer and few concession agreements were signed as the decade wore on.

THE ORIGINS OF THE SECRET REARMAMENT PROGRAM, 1919-1922

As noted in the first chapter, there was a legal economic component to Seeckt's vision of cooperation with the Soviet Union: he believed that open trade would moderate bolshevism and help Germany. But there was another secret element to his proposed economic ties. Seeckt worried about the decline of the German armaments industry. He was particularly concerned about the drastic circumscription of technological expertise and research in German military industry. In the fall of 1920, the Reichswehr was in the final stages of its Versailles-mandated reductions, and war industries felt the pain sharply. To offset those losses, and to find an outlet for the development of banned technologies, Seeckt decided to provide funding to German military manufacturers in critical areas of future development.⁶⁰ An alliance with Soviet Russia would provide a place for those activities, as well as a market for German goods.

⁶⁰ "Geheim - Abkommen, Vereinbarungen über Zusammenarbeiten von Reichswehrministerium und der Firma Fried. Krupp Aktiengesellschaft, Essen [Secret-Accord, Agreement on Cooperation between the Ministry of Defense and the Fried. Krupp Firm],“ January 25, 1922, WA/40 B 1350, Kruppisches Archiv, Essen (KA). It is referred to in Krupp correspondence as the "Secret Treaty." This treaty laid the groundwork for extensive cooperation between the Reichswehr and the Krupp Corporation on the development of new weapons system. It is the clearest example of the Reichswehr actively pursuing contracts to maintain major German arms manufacturers' ability to arm the country in the event of war.

The first military-industrial ties between Germany and the Soviet Union began less than two months after the signing of the Treaty of Versailles. In August 1919, the Allied powers demanded Germany participate in a total economic blockade of the Bolsheviks.⁶¹ This provision was not only ignored by German business; its circumvention was quietly encouraged by the Reichswehr. As noted earlier, when the Krupp Corporation sought to sell locomotives to the Soviet Government, the Reichswehr assisted them in transferring money through Sweden and shipping their finished products through the Baltic States.⁶² This was part of a larger arrangement during the summer of 1920, as the Reichswehr assisted the Soviets in acquiring a total of twenty seven million marks worth of military equipment.⁶³ Germany had large quantities of weaponry that would otherwise be destroyed by the Entente, while Russia still faced active fronts against Finland and in Central Asia. After discussions with Kopp, Lenin recommended to the Politburo that they pursue both economic and military cooperation with Germany. He also approved of using a “concessionary system” to hire German firms to conduct work

Rheinmetall, Daimler-Benz, Junkers, MAN and others also received contracts from or directed from the Reichswehr to maintain their military production capabilities.

⁶¹ This economic element was encouraged by German industrialists with whom Seeckt was acquainted, as well as by Radek. Seeckt had communicated with him via subordinates while he was in Moabit prison, and met with him face to face in January 1922, where they discussed the possibilities of military-industrial cooperation. Vourkoutiotis, p. 52; Zeidler, p. 59.

⁶² “Geschäftliche Beziehungen der Firma Krupp mit der Sowjet-Regierung in Russland in den Nachkriegsjahren [Krupp’s Business Relations with the Soviet Government in Russia in the Post-War Years],” WA/40 B 1350, Kruppisches Archiv, Essen (KA), p. 1. The Soviets seem to have ordered these locomotives as war materiel. But they arrived too late to play any role in the course of the Russian Civil War or the Polish-Bolshevik War.

⁶³ “Top Secret: To Comrade Lejava,” August 20, 1920, F. 33987-3-52, l. 430, RGVA, reprinted in Dyakov and Bushuyeva, p. 32. It seems possible that the rail purchases from Krupp were included in this monetary total, though it cannot be said for certain.

on military-industry in the Soviet Union, as per Seeckt's plan. This would have the added benefit, he noted, of making their work "deniable" should they be discovered.⁶⁴

A number of Soviet delegates were sent to reach agreements with German firms. Leonid Krasin, Commissar for Foreign Trade, was dispatched on a mission to Berlin to procure weapons in November 1920.⁶⁵ Not long after, Kopp directed a Soviet trade representative, S.G. Brygkov, to Niedermayer, who in turn referred him to a series of "arms dealers of... dubious reliability."⁶⁶ After this disappointment, Commissar of Foreign Affairs Chicherin directed Kopp to focus his efforts on trade, not military matters. Nonetheless, Kopp returned to Russia in early 1921, relaying German terms for a possible commercial protocol involving military industry.⁶⁷ He also reported that Sondergruppe R "is willing to cooperate with us in restoring our war industry, specifically in the following three areas: aircraft construction, submarine construction and ammunition manufacturing."⁶⁸ He further added that Sondergruppe R had already approached three major German arms manufacturers, all of whom (under the terms of strictest secrecy) would be willing to provide "technical knowledge and the necessary equipment."⁶⁹ Soviet leadership agreed. Otto Hasse dispatched Oskar von Niedermayer to Moscow in the summer of 1921 to see to these arrangements.

⁶⁴ Vourkoutiotis, pp. 120-121. It is unclear exactly with which foreign power Lenin was concerned at this juncture. Certainly he hoped to repair relations with Great Britain and the United States in order to attract at least some foreign investment, but at this juncture that was not a clear possibility. It seems likely that his central concern was avoid the discrediting international communism by the public revelation of its dealings with its capitalist enemies.

⁶⁵ "Protokol № 36, Zasedaniya Politicheskogo Biuro TSK ot 13 Avgusta 1920 G. [Minutes of a Meeting of the Politburo of the Central Committee on 13 August 1920," August 13, 1920, 17-3-102, 1, RGASPI, p. 2.

⁶⁶ Vourkoutiotis, p. 100.

⁶⁷ Zeidler, p. 54.

⁶⁸ Ibid, pp. 54-55.

⁶⁹ Ibid, p. 55.

His first task was to visit Russian military industrial facilities in the company of Kopp, assistant commissar Karakhan and German diplomat Gustav Hilger, who remained in charge of the German POW office in Moscow.⁷⁰ There were considerable hopes on both sides for the massive military-industrial cooperative program proposed by Seeckt and encouraged by Trotsky. But the tour of the Petrograd factories and shipyards in the early summer of 1921 proved that such a possibility was unlikely. As Hilger recalled in his memoirs,

The impression von Niedermayer and I received from the inspections was devastating. Most of the factories and shipyards were not in operation because raw materials were non-existent and because a large part of the workers had taken refuge in the villages in order to escape starvation in the city. Roofs everywhere were damaged, so that the machinery was exposed to the destructive effects of rain and snow; and for the most part the machines were in an unspeakable condition. It was clear to us that any German participation in the reconstruction of Petrograd's industry was, under these circumstances, out of the question.⁷¹

Niedermayer wrote back to Berlin regarding the disappointment of German hopes. But Seeckt and the staff of Sondergruppe R remained undaunted: in October 1921, the first meetings began between Otto Hasse of Sondergruppe R with Krasin and Kopp to discuss the general terms of military-industrial agreements.

One of the central requirements of the proposed plan was the cooperation of Germany's largest firms. Most were in support of secret rearmament, and eager for economic opportunities in Russia. The leader among them was the German steel giant Krupp, which had also been the largest military production firm in Germany during the

⁷⁰ Hilger, Meyer, p. 195. In 1921, the Reichswehr apparently deemed Hilger worthy of trust, but not his superiors in the German Foreign Ministry.

⁷¹ Hilger, Meyer, p. 197.

First World War.⁷² In January 1922 Gustav Krupp, the head of the Krupp family and business, offered a particularly valuable proof of his support for Seeckt's plans. He signed a secret agreement with the Reichswehr to participate in a vast, long-term program for the rearmament of Germany.⁷³ The document stated that "in the common interest, Krupp must use its own experience for the development of up- to-17 cm caliber guns, ammunition and vehicles, as well to make available to the Ministry of Defense the experiences of Krupp on these subjects."⁷⁴ The items detailed in the Secret Treaty – tanks, naval guns, and other military equipment – were explicitly banned by the Treaty of Versailles. In exchange for Krupp's cooperation and the considerable liability it assumed, the Reichswehr guaranteed precedence to Krupp patents and licenses in areas of future military development, specifically those curtailed by the Treaty of Versailles.⁷⁵ Krupp also gained priority when it came to Reichswehr purchases in certain areas of military equipment.⁷⁶ Krupp also actively worked towards a deal with Russia. Via Viktor Kopp,

⁷² One of the largest companies in the world prior to 1914, Krupp had been particularly hard hit by the terms of Versailles. Its largest plant in Essen lost more than half of its heavy machinery to IAMCC inspectors; these were removed and given to France as reparations. A series of strikes, hyperinflation, and revolutionary violence in the Ruhr had cost the Krupp Corporation considerably. Coupled to this was the militant nationalism of the family company's leader, Alfred Krupp von Bohlen und Halbach: he would become a major Nazi Party donor and personally joined the SS in 1931.

⁷³ Ibid.

⁷⁴ "Geheim - Abkommen, Vereinbarungen über Zusammenarbeiten von Reichswehrministerium und der Firma Fried. Krupp Aktiengesellschaft, Essen [Secret-Accord, Agreement on Cooperation between the Ministry of Defense and the Fried. Krupp Firm]," January 25, 1922.

⁷⁵ Ibid.

⁷⁶ Krupp would have extensive dealings with the Soviet regime, being given some of the earliest industrial and agricultural concessions. So extensive was their cooperation that, as will be discussed later, some Krupp officials in the Soviet Union actually served as Red Army instructors and wore Soviet uniforms. In addition, on April 17, 1929 (with the permission of the Reichswehr), Krupp signed an extensive military industrial agreement with the Soviets: "The Krupp Firm proposes to pass over to the Russian side without exclusion the experience on all special designs (field-gun systems, shells, detonating fuses, fuses) gained by it before 1918, as well as all the experience it has got without exclusion on all designs devised after 1918. The latter designs have been worked out in close cooperation with the German government, and the present talks are being held with the German government's knowledge and sanction. ("From the Talk of

Gustav Krupp proposed to Soviet leadership a vast program of industrial concessions on a fifty-year-lease in the Soviet Union for the

‘production of agricultural machines and appliances, production of machined instruments, household-merchandise and mass-produced articles for rural economies, the repair of locomotives, construction of locomotives and rail-wagons, construction of merchant-ships...’ as well as artillery, shells, gun-barrels, gun mounts, munitions wagons and even submarines.⁷⁷

This proposal was a central part of Seeckt’s master plan for the refurbishment of Russian factories to serve a future German war effort. Although nothing immediately came from this Krupp proposal, throughout 1921 and 1922, meetings continued between Soviet trade delegates and the captains of German industry.

With Germany’s largest military manufacturer committed, the Reichswehr began to seek other corporate allies for Russian projects. Seeckt and Hasse were particularly eager to find a partner for the Soviet aviation industry. Senior German military officials repeatedly visited Junkers AG, one of Germany’s top aviation firms, from July to November 1921. The next month, Director Sachsenberg of AeroLloyd, a Junkers subsidiary and Germany’s state airline, traveled to Moscow.⁷⁸ Demonstrating the importance of the military-industrial strategy to both Seeckt and the Russian government, Sachsenberg received a personal meeting with Trotsky to discuss the possibility of

Representatives of the “Krupp” Firm and Soviet Machine-Building Industry,” April 17, 1929 in *The Red Army and the Wehrmacht: How the Soviets Militarized Germany, 1922-1933 and Paved the Way for Fascism, from the Secret Archives of the Former Soviet Union*, primary source collection edited and translated by Yuri Dyakov and Tatyana Bushuyeva (New York: Prometheus Books, 1995), p. 75.)

⁷⁷ Vourkoutiotis, pp. 122-123.

⁷⁸ Vourkoutiotis, pp. 122-123. AeroLloyd was the forerunner to Lufthansa, which was created in January 1926, when the German government encouraged its two partially stated own airlines to merge. Lufthansa would become involved in the secret training of future Luftwaffe pilots.

establishing production facilities in Russia. Yet again, neither side agreed to a concrete proposal during these meetings.

In early 1922, the Soviet delegation on its way to Genoa stopped in Berlin. During their stay, they met with Hugo Junkers, founder and head of Junkers AG, to press him to sign a contract for a concessionary agreement with the Soviet Government. The Reichswehr also pressured Junkers, hoping to have some formal arrangement in hand before the summit in Genoa. With some reluctance, Junkers agreed to a preliminary contract on March 15, 1922, contingent upon significant financial guarantees provided by Hasse.

THE APOGEE OF COOPERATION IN WAR INDUSTRIES, 1922 TO 1927

The Soviet concessions system provided a relatively solid foundation for foreign capital investment in the Soviet Union from 1919 to 1928.⁷⁹ From May 6, 1921, the German Foreign Ministry was allowed direct access to the Main Concessions Bureau, making it much easier for the German Embassy in Moscow (formally reestablished in 1921) to initiate contract negotiations between the Soviet state and private German firms.⁸⁰ But for both states' leadership, there was considerable interest in military industrial cooperation that had to be handled through different channels. To that end, in

⁷⁹ This is demonstrated in part by how much the Soviet Union was exporting to Germany, much of it sent to cover the costs of its purchases from German industry. In 1924, the German Foreign Ministry estimated that as much as 40 percent of all Russian exports were being sent to Germany. "Niederschrift über die informatorische Besprechung über die gegenwärtige Lage der deutsch-russischen Beziehungen im Auswärtigen Amt [Minutes of an Informational Meeting in the Foreign Ministry about the Current State of German-Russian Relations]" R 31492K/KO96760, June 25, 1924, PA-AA, p. 1.

⁸⁰ Haigh, Morris, Peters, p. 167.

September 1921, Krasin and Radek met with General Schleicher and Colonel Hasse in Berlin to discuss the formation of military-industrial concessions in areas of mutual interest. These, both sides agreed, were in three major areas – chemical warfare, aviation and ammunition production.⁸¹

On August 9, 1923, Sondergruppe R organized Moscow Center's subsidiary agency, the *Gesellschaft zur Förderung gewerblicher Unternehmungen* [or *GEFU*] to supervise its military industrial projects in the Soviet Union. This shell company was organized to supervise the transfer of military expertise and production to the Soviet Union. To ensure secrecy and provide the Reichswehr deniability, GEFU's board members were officers who had "resigned" from the Reichswehr, a model that would be followed for all future cooperative endeavors. Seeckt's trusted right-hand Tschunke, would be the first to head GEFU.

There was another issue: hiding the efforts of GEFU from the civilian leadership of the Weimar Republic. With the signing of Rapallo, an official ambassador was sent to Russia: Count Ulrich von Brockdorff-Rantzau, one of Germany's most experienced diplomats. His presence was awkward for the Reichswehr: Rantzau was adamantly opposed to illicit military activity in Russia.⁸² Further, he was a personal enemy of Seeckt, the two men having sparred during their work in Paris on the Treaty of Versailles.

⁸¹ Hilger, Meyer, p. 161.

⁸² Ibid, pp. 167, 169. Brockdorff-Rantzau had written early in his posting that he "regard[ed] any military agreement with the Russians as extremely dangerous." Vourkoutiotis, p. 159. But Brockdorff-Rantzau's position softened somewhat during his time in Moscow. By 1926, his major remaining complaint was that he was not being informed of German military activities in Russia. In theory, Seeckt had agreed to place the Moscow Embassy in charge of all military agreements in July 1923, but this was not the case in practice.

Seeckt had impugned Rantzau's honor for failing to fight Versailles' military limitations more effectively. As Rantzau would remain ambassador in Russia until 1928, his relationship with the Reichswehr presented major problems until Seeckt's resignation created space for compromise. So bad was the relationship between the Reichswehr and the Auswärtiges Amt that in 1923, Moscow Center was instructed to send "its entire correspondence to Berlin through Russian couriers and not through German diplomatic channels."⁸³

On the Soviet side, Arkady Rosengoltz, now a member of the RVS, became the liaison with the Germans for military-industrial projects beginning in late 1922. He would stay on to serve as the primary contact for GEFU throughout its existence.⁸⁴ During his time in office, he traveled to Germany twice, in January 1923 and January 1925.⁸⁵ This highlights the fact that most of the negotiations were conducted in Moscow. Both sides had reasons for this: the German military sought to hide its negotiations from its own government. The Soviets retained considerable control by hosting negotiations in Moscow. They could, if they so desired, blackmail the German military by threatening to reveal the negotiations to Germany's civilian leadership or to the general public.

While Rosengoltz handled the details of corporate negotiations, the vice chairman of the RVS Josef Unschlikht, handled all other communications and contracts from 1923 to June 1930. During Mikhail Frunze's reorganization of the Red Army in 1925, daily management of the secret Soviet-German projects was placed into the hands of Red

⁸³ Carsten, p. 233.

⁸⁴ Gorlov, p. 93.

⁸⁵ Ibid.

Army military intelligence, headed by Ianis Berzin.⁸⁶ From 1925 to 1930, Berzin and Unschlikht thus worked hand in hand. In 1930, Unschlikht was removed the RVS, Berzin took over sole responsibility of the management of contact with the Germans.⁸⁷

With the formation of administrative structures on both sides, the conclusion of joint industrial projects could press ahead. In the fall of 1923, the Reichswehr provided GEFU with 75 million marks – in gold – as start-up capital.⁸⁸ Between 1922 and 1923, Tschunke reached three major contracts with German firms for military-industrial projects. The first was previously noted concessionary agreement with Hugo Junkers: the Reichswehr-Junkers contract was agreed to on March 15, 1922, and a formal arrangement reached with the Soviet government in October of that year. Next, Krupp AG reached a series of agreements with the Soviets to manage the production of ammunition and artillery at four different factories spread across the Soviet Union. The final major contract, signed on May 15, 1923 was reached with the firm Stolzenberg AG for the production of chemical agents near Samara, Russia.⁸⁹

THE JUNKERS ARRANGEMENT

Seeckt invested particular effort in shifting combat aircraft production to Russia. He had considered the creation of AeroUnion as a first step towards the transfer of aircraft manufacturing to Russia. However, as the Reichswehr noted, Aerounion

⁸⁶ Gorlov, pp. 93-94

⁸⁷ Ibid.

⁸⁸ Zeidler, p. 80. This was done with the consent of then-chancellor Cuno.

⁸⁹ This contract is covered in detail in chapter three.

eventually “rejected the manufacture of aircraft in Russia.”⁹⁰ They concluded that the costs of transportation, manufacture and raw materials would make Russian-built aircraft financially uncompetitive on the world market.⁹¹ In addition, the political risks appeared to them to be too great.⁹² Undaunted, Seeckt continued to pursue a deal with one of Germany’s most famous aeronautical engineers, Hugo Junkers. As a result, Junkers AG would become involved in a web of conspiracy spun by Seeckt between 1920 and 1926.

Hugo Junkers was a brilliant engineer who had reluctantly manufactured aircraft for the German state during World War I. As an ardent pacifist and a German nationalist, he found himself torn when it came to supporting the German war effort. After the war, he tried to distance himself from military manufacturing as quickly as possible. However, Seeckt had other plans for the firm and began corresponding with Junkers personally in the early 1920s.

In early March 1922, Junkers met with members of the newly formed “Z.” From the outset, Junkers expressed his worries about the costs and risks of the joint venture. To make the concession possible, Hasse and “Z” agreed to subsidize him with a grant of 140 million paper marks; 100 million was to serve as the capital for Junkers’ Russian venture, while an additional 40 million was to cover any costs or complications arising from the unique difficulties of working in Russia in 1922.⁹³ These included the problems of transport, shortages of skilled labor, inconsistent deliveries of raw materials, food

⁹⁰ “Zweiter Schriftsatz des Reichsministeriums zur Klärung seiner Beziehungen zu Prof. Dr. Junkers,” February 15, 1926, RH/2, 1130, BA-MA, pp. 4, 6.

⁹¹ Ibid.

⁹² Ibid, 6.

⁹³ “Zweiter Schriftsatz des Reichsministeriums zur Klärung seiner Beziehungen zu Prof. Dr. Junkers,” p. 7.

shortages and the still unstable political regime. Junkers and Hasse signed an agreement for preliminary funding and support during negotiations with the Russians on March 15, 1922; it would serve as the basis for Junker's relationship with the Reichswehr. The Reichswehr's preliminary financial assistance quickly proved to be less valuable than it initially appeared, however, because of the growing German inflationary crisis. The Reichswehrministerium noted that the first payment made to Junkers, on March 27, was worth \$115,168.39. But by the time the last payment was made less than six weeks later, the exchange rate had grown precipitously worse, and was worth only \$44,725.45.

Junkers later wrote that during these early meetings, he received verbal guarantees by the Reichswehr that they would give Junkers priority on aircraft purchasing contracts.⁹⁴ With these in hand, he reluctantly agreed to enter negotiations with Soviet trade representatives. The Soviets were interested in turning over the "Second Russo-Balt Automobile Factory" in the Moscow suburb of Fili to Junkers AG on a thirty-year lease. During negotiations in May, a Junkers representative wrote to Leon Trotsky that for the venture to be worthwhile to his corporation, "in execution of the overall program [in Russia], the Junkers Corporation would need to bring into the company an approximate value of DM 1 billion."⁹⁵ The Russians apparently scoffed at providing any substantial portion of that figure themselves. Facing a significant financial gap in the establishment of the Fili plant, Junkers wrote to Seeckt's Sondergruppe. He began by noting that "In the first negotiations between Junkers and the SG [Sondergruppe] over the conditions for a

⁹⁴ "Junkers-Von Seeckt Correspondence," 1922-1924, RH 8, 3681, BA-MA.

⁹⁵ "Vereinbarung zwischen der russischen Regierung und den Junkerswerken," p. 1.

possible agreement, the SG has to ensure, in view of the truly vast and uncertain conditions, that the SG procure the required capital in full...”⁹⁶ This meant at least 600 million paper marks; this was the stated sum necessary for the completion of the “Greater” Fili plan, which would involve the manufacture of aircraft and engines, rather than just assembly of component parts manufactured in Germany. Facing this staggering sum, Junkers added in his letter that “Junkers AG must be secure against any risk created by internal and external political conditions.”⁹⁷ Such a guarantee was clearly beyond the abilities of the Reichswehr in 1922.

In a letter sent on July 7 to the Reichswehrministerium, Junkers apparently made it clear he could not accept the terms currently being offered for the Fili facility. He received a mollifying reply from the Sondergruppe:

I waited for several days in the hope that we would have an opportunity to discuss your letter of July 7 in person. However, since that possibility is currently postponed, let me answer your letter with a few words. We should resolve our misunderstanding...you have unilaterally imposed [on the entire concept of Fili] unfavorable assumptions and unsustainable business terms.⁹⁸

The letter continued by assuring Junkers that a workable arrangement could be made between himself and Rosengoltz, the Russian in charge of managing foreign concessions. The author continued to assure Junkers: “You must not overlook that I have managed to get the Russians to relent and make a number of concessions already. The Russians desire to come to a conclusion and will eventually accept reasonable conditions.”⁹⁹

⁹⁶ Hugo Junkers, “Letter to Hans von Seeckt,” May 19, 1922, RH/2, 1130, BA-MA, p. 1.

⁹⁷ Ibid.

⁹⁸ “Letter to Herr Professor Junkers,” July 12, 1922, RH/2, 1130, BA-MA. There is no signature on the document, but it is likely from General Hasse.

⁹⁹ “Letter to Herr Professor Junkers,” July 12, 1922, p. 1.

While letters flew between Junkers and the Special Group, Seeckt applied pressure in another way. The Reichswehr did not have the financial resources to guarantee Junkers anything in writing. However, Generals “Hasse and Wurtzbacher, at a hospitably prepared meal together...[with Junkers] talked about the common interests of both parties.” Over the course of the meal, there was some drinking. The “two gentlemen” made a number of toasts which convinced Junkers that they had agreed to guarantee him against possible financial losses.¹⁰⁰ When the Junkers scandal broke in 1926, Junkers took these preliminary conversations as a contract, assuming, perhaps naturally, that given the clandestine nature of the work, not all of the negotiations would be drawn up on paper. The Reichswehr countered that the only “truly binding contract was that which was drawn up in writing and dated March 15, 1922.”¹⁰¹ Further, Generals Hasse and Wurzbacher later denied Junkers’ assertions regarding their conversation.

But that lay in the future. By the end of the summer of 1922, Junkers considered himself financially protected by these verbal guarantees from Reichswehr representatives. He wrote back to Rosengoltz, the Soviet representative. Rosengoltz replied that Junkers needed to make a swift decision: negotiations had already drawn on for eight months by the end of August. He added that “I would also suggest that a rapid conclusion of the contract is also in the interest of the Junkers company because it is a danger, if you do not immediately conclude an agreement, that a large part of the [aircraft] orders could go on to other companies.”¹⁰² Finally, on October 23, 1922, Junkers’ representatives wrote back

¹⁰⁰ “Letter to Herr Professor Junkers,” July 12, 1922, p. 1.

¹⁰¹ Zweiter Schriftsatz des Reichsministeriums zur Klärung seiner Beziehungen zu Prof. Dr. Junkers,” February 2, 1926, RH/2, 1130, BA-MA, p. 1.

¹⁰² Rosengoltz, “Letter to Junkers AG,” RH/2 2305, BA-MA, 8.30.1922,” p. 1.

to Rosengoltz in Moscow: “We have decided to abandon our previous position and to welcome a concession for Russo and Russo-Balt Fili and Russo-Balt Petersburg.”¹⁰³

Junkers AG was now committed.

The Reichswehr’s Special Group appeared as a signatory on the final treaty text, guaranteeing Junkers’ investment in the facility, though exactly what this guarantee entailed became a matter of dispute. In addition, the agreement noted that the Soviets expected at least 650 million paper marks in capital to be invested by the company before production would begin.¹⁰⁴ Trotsky was intimately involved in the final negotiations; his name appears on the document, showing the value the Soviets placed in assisting the German firm in establishing industrial facilities on their soil.¹⁰⁵ The Soviets expected Junkers to begin manufacture in early 1924 with a goal of producing 100 aircraft a month at peak capacity.¹⁰⁶

Difficulties became apparent immediately after the Junkers Corporation sent representatives to Moscow to examine conditions at the Fili Plant at the behest of the Soviet Government. The high cost of purchasing Duraluminum, a material necessary for aircraft production, was compounded by the difficulties of transporting it through the crippled Soviet rail net in the aftermath of the Russian Civil War. Labor and transport costs meant that Junkers simply could not afford to run the facility on its own without large orders from the German and Russian militaries. Junkers requested the Reichswehr

¹⁰³ “Letter to Herrn Rosengoltz,” October 23, 1922, RH/2 2305, BA-MA.

¹⁰⁴ “Vereinbarung zwischen der russischen Regierung und den Junkerswerken,” February 6, 1922, RH/2, 1130, BA-MA, pp. 1-5.

¹⁰⁵ “Vereinbarung zwischen der russischen Regierung und den Junkerswerken,” pp. 1-5.

¹⁰⁶ *Ibid.*

and the Soviet Air Force make down payments on their first order of aircraft immediately.¹⁰⁷ He asked General Hasse and “Z” to make it clear to the Soviets that without the purchase of at least 100 aircraft immediately, and possible orders for an additional 500, they would not proceed with construction at Fili.

“Z” managed to make these conditions work. On November 26, 1922, The Soviet Government and Junkers Corporation signed a second agreement which officially initiated the Junkers Plant. “Konzessions-Vertrag Nr. 1” was the first industrial concession granted to a firm to manufacture military equipment on Soviet soil.¹⁰⁸ Specifically, this second agreement required Junkers to manufacture 300 aircraft and 450 aircraft engines on Russian soil by the second year of the agreement.¹⁰⁹ On December 4, 1922, Junkers AG reached a separate agreement with Rosengoltz and the Soviet Air Force, meeting his precondition of aircraft purchases by the Russians. The Soviet Air Force would pay 2,243,805 Gold Rubles in exchange for 100 aircraft of four different models, to be delivered by the end of 1924.¹¹⁰ In addition, the Soviets also granted Junkers a monopoly upon air travel on the Sweden-Persia air route and would pay Junkers to conduct a number of aerial surveys of Soviet territory.¹¹¹

¹⁰⁷ “Vereinbarung zwischen der russischen Regierung und den Junkerswerken,” p. 4.

¹⁰⁸ “Das Junkers-Unternehmen in Fili (Russland) in seiner Entwicklung und seinem Verhältnis zum Reichswehrministerium bis zum Herbst [19]25,” January 13, 1926, RH/2, 1130, BA-MA, p. 1.

¹⁰⁹ Ibid, p. 2.

¹¹⁰ Ibid, 10.

¹¹¹ “Vereinbarung zwischen der russischen Regierung und den Junkerswerken,” February 6, 1922.

THE FACTORY AT FILI

The large factory building in which the Junkers plant was to be housed had been built by the “Second Russo-Balt Automobile Company” in 1917.¹¹² The facility failed to produce any automobiles before being nationalized in the aftermath of the October Revolution. Automobile production began there in 1922, but under the extremely difficult circumstances of post-Civil War Russia, only five automobiles rolled off the lines.¹¹³ The facility at Fili reopened under Junkers’ control on January 23, 1923, when a German engineering team from Junkers arrived to begin updating the factory’s equipment. Since it lacked necessary heavy machinery, the factory could not initially produce finished aircraft engines; instead, it began assembly of aircraft components shipped to Russia from Germany. Throughout 1923 and into 1924, Fili was increasingly staffed by Russian personnel operating under German supervision, mostly assembling aircraft parts.¹¹⁴

Connected to the city center by a direct rail line, the factory was made up of six buildings during the time of German production.¹¹⁵ A main factory building, laid out in open floor style, sat along the road from Moscow to the Fili town center. Behind it stood the assembly hall, where component parts were put together. Next door, an armory building held munitions and the machine guns to be mounted on each aircraft. Finally, several hundred yards away from the factory grounds stood three large hangers that

¹¹² “History,” Khrunichev State Research and Production Space Center, August, 2012, Accessed October 17, 2013, <http://www.khrunichev.ru/main.php?id=36> .

¹¹³ Ibid.

¹¹⁴ “Mitglied des Obersten Konzession, Moskau,” October 23, 1922 RH/2, 230, BA-MA.

¹¹⁵ “Bericht den Besuch des Flugzeugwerkges in Fili,” February 17, 1931, RH/12/1, 56, BA-MA.

housed assembled aircraft. A separate rail line ran directly to the hangars for easy transport of the finished product.¹¹⁶

One of the central debates at Fili was the question of which aircraft to manufacture. In 1920, 23-year-old engineer Ernst Zindel joined Junker AG in Dessau. Professor Junkers paired the young man with one of his long-time associates, the forty-year-old Otto Mader.¹¹⁷ This team would be responsible for all four new designs to be produced in Russia. Their designs were to be produced only at Fili. This was necessary given the fact that all four were explicitly for military use; their construction required secrecy, which only Fili could provide.¹¹⁸ The first blueprint completed was the J-A20 monoplane. Made of duraluminum, the J-20 observer aircraft could be fitted with buoys or skis for water, river and snowpack landings.¹¹⁹ It entered production on a small scale at Dessau and in Leningrad under German supervision before assembly began at Fili.

Zindel's J-22 I and IIs were single seat, monoplane fighters armed with a 7.62 mm machine gun.¹²⁰ Zindel based the design on the T-21, an earlier model, to save time in order to hurry the aircraft into production; the results were not impressive. Further, the awkward wing positioning on J-22 prototypes restricted the pilot's vision to a narrow slit ahead and to the sides of the aircraft, a serious disadvantage in a fighter aircraft.¹²¹ Only two prototypes were ever successfully produced before the design was rejected for mass production.

¹¹⁶ Ibid.

¹¹⁷ Antony Kay, *Junkers Aircraft & engines 1913-1945* (London: Putnam Aeronautical Books, 2004), p. 42.

¹¹⁸ Ibid, pp. 45-46.

¹¹⁹ Ibid, p. 46.

¹²⁰ Ibid, p. 44-45.

¹²¹ Ibid, p. 45.

The bulk of the Soviet order, a total of fifty aircraft, were J-21s.¹²² Zindel designed these reconnaissance aircraft again based on earlier, experimental designs. Initially fitted with a underpowered engine, the engineering team soon upgraded early prototypes to a new BMW IV engine. Designed to be a two seater fighter or observer aircraft, they were armed with two 7.62 mm machine guns for the pilot and a gunner or observer.¹²³ The Junkers plant in Dessau, Germany, clandestinely finished testing and building two J-21s prototypes in early 1923. These were dismantled and shipped to Fili, where they were reassembled and used as models for the production line.

Colonel Lieth-Thomsen and Major Wilberg of Sondergruppe R went to Moscow in October 1923.¹²⁴ Among other things, they toured the Junkers plant at Fili. The original concession agreement, signed a year earlier, required Junkers to manufacture the engines at Fili, but during the intervening year, almost no machinery had been imported from Germany to begin that manufacturing process. As a result, Thomsen noted to his superiors that Fili was still not capable of production.¹²⁵ They also noted after having toured the facility that “it was understandable that between the Chief of the [Red] Air Force (Rosengoltz) and Junkers there was no trust whatsoever.”¹²⁶

¹²² “Das Junkers-Unternehmen in Fili (Russland) in seiner Entwicklung und seinem Verhältnis zum Reichswehrministerium bis zum Herbst ‘25 [The Junkers Operation at Fili (Russia) in its development and its relationship with the Ministry of War through the fall of 1925],” January 13, 1926, RH/2, 1130, BA-MA, p. 1.

¹²³ Kay, p. 45-46.

¹²⁴ “Das Junkers-Unternehmen in Fili (Russland) in seiner Entwicklung und seinem Verhältnis zum Reichswehrministerium bis zum Herbst ‘25 [The Junkers Operation at Fili (Russia) in its development and its relationship with the Ministry of War through the fall of 1925],” p. 1. Lieth-Thomsen would take up permanent residence in Moscow the following month as the head of “Z.”

¹²⁵ Ibid, p. 12.

¹²⁶ Ibid.

The Fili Plant ran into further difficulties with the aircraft blueprints themselves. While the assembly of J-21s began without issue in early 1923, it soon became apparent that the J-22 prototype was unready for mass production. Junkers cancelled the Soviet order of the J-22s and offered thirty additional J-21s. The Soviets reluctantly agreed. They received the first 73 aircraft on time in late 1924.¹²⁷ The Soviet Air Force complained to the Reichswehr about the delay in the remaining aircraft, but given the difficult conditions of manufacture and transport, Junkers' completion of the majority of the first order was quite remarkable.

There were other problems, however. The J-21 was underpowered. The Treaty of Versailles placed restrictions upon engine power which Junkers was reluctant to exceed. There was more than a bit of irony in this: the aircraft were obviously being put to military use in the Russian air forces and were being used to covertly train German pilots inside Russia by 1926 in violation of the Treaty of Versailles. But Junkers had hopes that someday he would be able to market a civilian version of the aircraft legally to commercial aviators in Germany and elsewhere, and so had the power of the engine reduced accordingly.

As one of the first post-war monoplane designs, the Soviets wanted to use the J-21 to replace their Tsarist, World War I era reconnaissance aircraft. Unfortunately for Junkers and the Russian Air Force, the J-21 proved to be only a slight improvement on World War I designs.¹²⁸ Junkers had stated in the order of December 1922 that the J-20

¹²⁷ "Das Junkers-Unternehmen in Fili (Russland) in seiner Entwicklung und seinem Verhältnis zum Reichswehrministerium bis zum Herbst '25," *Janaury* 13, 1926.

¹²⁸ "J-21," *Ugolok Neba*, Aviation Encyclopedia (Russian) <http://www.airwar.ru/enc/other1/ju21.html>.

and J-21 would have a maximum speed of 190 kph (116 mph); this was already slower than most Entente fighters at the end of the war.¹²⁹ But when actually delivered, Soviet tests indicated that the plane could barely break 160 kph (100 mph).¹³⁰ Their engineers also reported the aircraft was 200 kilograms heavier than Junkers had claimed and took twice as long to climb to altitude as Junkers had promised.¹³¹ Rosengoltz angrily complained to Hasse about this state of affairs, leading to the Reichswehr dispatching Thomsen and Wilberg several times over the course of 1924 to investigate the continuing difficulties at Fili.

Concern over the continuing failure of the Junkers Corporation to manufacture any component parts in Russia led to a special meeting on February 24, 1924.¹³² Held in the Reichswehr's ordinance office, the Reichswehr invited representatives of both Junkers and BMW. Since Junkers had been attempting to manufacture BMW engines under license for their J-20s and J-21s, it was decided that the two firms should merge their Russian operations and together construct an engine production facility on the grounds of Fili to supplement the assembly work already being done.¹³³

Seeckt and General Hasse clearly considered this second facility to be of paramount importance. Given escalating Russian complaints about the quality and quantity of German production in Russia, it was necessary to show the Reichswehr's dedication to military-industrial cooperation. To that end, Lieth-Thomsen returned to

¹²⁹ "Das Junkers-Unternehmen in Fili (Russland) in seiner Entwicklung und seinem Verhältnis zum Reichswehrministerium bis zum Herbst '25," January 13, 1926, p. 11.

¹³⁰ Ibid, p. 11.

¹³¹ Ibid.

¹³² Ibid, p. 19.

¹³³ Ibid.

Moscow in the company of the General Director of BMW himself, Franz Joseph Popp.¹³⁴

The Reichswehr invited Junkers AG to attend or send representatives, but according to Reichswehr records, Dr. Junkers refused, perhaps because of the failure of the Reichswehr to place any orders with his firm by that date.

The meeting between BMW and the head of the Red Air Force, Arkady Rosengoltz, was a failure, according to Reichswehr reports. Rosengoltz demanded the previous contract for aircraft be fulfilled before talk of a new facility could begin.¹³⁵ When the Reichswehr again spoke to Junkers, he responded to Russian charges by claiming Russian intransigence and failure to make payments on time.¹³⁶ At this point in 1924, Dr. Junkers requested 20 million gold marks to fund the expansion of its facilities at Fili and begin production on BMW motors there.¹³⁷

A month later, Dr. Junkers himself met with Generals Wurtzbacher and Hasse. Also in attendance was Junkers Director Sachsenberg.¹³⁸ The men conceded Junkers' main issue: that expansion was necessary to make Fili productive. The Reichswehr representatives then said that 20 million marks was simply beyond the Reichswehr's budget at that time.¹³⁹ However, General Hasse agreed to extend to Junkers an additional 8 million marks; the remaining 12 million was to be acquired via credit.¹⁴⁰ While this might have been satisfactory to Junkers, he was very upset about news that the

¹³⁴ "Das Junkers-Unternehmen in Fili (Russland) in seiner Entwicklung und seinem Verhältnis zum Reichswehrministerium bis zum Herbst '25," p. 19.

¹³⁵ Ibid, 20.

¹³⁶ Ibid.

¹³⁷ Ibid, p. 21.

¹³⁸ Ibid, p. 24.

¹³⁹ Ibid, p. 23.

¹⁴⁰ Ibid, p. 25.

Reichswehr was pursuing aviation contracts with foreign firms, rather than with him.

According to the Reichswehr, General Hasse became defensive during this meeting:

Hasse “emphasized his loyal behavior towards Junkers throughout the period of cooperation [between the Reichswehr and Junkers]. Hasse had never agreed to anything more than was within his power to do. He said that he had only placed a large order of aircraft with another company after Lieutenant Colonel Dr. Schubert confirmed that Junkers could not export their aircraft for sale [in Germany].¹⁴¹

When it became apparent that the sale was going ahead, Junkers believed he had been betrayed. Contrary to Hasse’s concerns, his new aircraft designs in Russia were specifically intended for export, though they would have to be altered to hide their military functionality. Further, Junkers believed that the Reichswehr had made clear verbal guarantees to purchase his aircraft back in 1922.

Despite Junkers’ anger, the Reichswehr pressed ahead with its purchase. They bought fifty Fokker D-XIIIs from the Dutch Fokker firm in the summer of 1924. To fool the Entente, they routed their purchases through Argentina. These Fokker D-XIIIs were designed specifically for the clandestine German flight school then under construction at Lipetsk inside the Soviet Union.¹⁴² The aircraft were shipped directly to Lipetsk upon completion.¹⁴³ The Fokker D-XIIIs were significantly superior to the aircraft Junkers was producing in the early 1920s.¹⁴⁴ For a brief period, they stood atop the pinnacle of aviation technology: in pre-production testing in 1924, D-XIIIs set four world airspeed

¹⁴¹ “Das Junkers-Unternehmen in Fili (Russland) in seiner Entwicklung und seinem Verhältnis zum Reichswehrministerium bis zum Herbst ’25,” p. 25.

¹⁴² For more on Lipetsk, see chapter five.

¹⁴³ Robert Craig Johnson, “Planting the Dragon’s Teeth: The German Air Combat School at Lipetsk (USSR) 1925-1930,” *Chandelle* Issue 3 (3) (December 1998), pp. 1-3.

¹⁴⁴ Enzo Angelucci, *The Rand McNally Encyclopedia of Military Aircraft, 1914-1980* (New York: The Military Press, 1983), pp. 126-127.

records.¹⁴⁵ The D-XIII would become the main testing plane for the German Air Force until 1933, replacing the inferior Junkers aircraft.¹⁴⁶

The first angry correspondence between Junkers and Seeckt began in March 1924. Junkers complained that “we had expected to get in the course of the spring of 1924 100 [new] aircraft [orders] at a cost of 2.7 million with a 1.35 million down payment.”¹⁴⁷ He went on to state that between the Reichswehr and the Soviet Air Force, he had expected new orders totaling an initial down payment of 4,625,000 Reichsmarks,¹⁴⁸ none of which had been forthcoming. The new contracts “as we were told are not currently under debate.”¹⁴⁹ The lack of orders made it impossible to produce aircraft at the agreed-to cost. He asked the Special Group representative in Berlin what recourse he had: “in what form we will take action against this infringement of the Russian government...” The Sondergruppe expressed some disapproval at his frustration; the reply from Seeckt was cold: “for military and political reasons I am not in a position to respond to your proposal.”¹⁵⁰

Seeckt had been bluffing with his promises of financial assistance. Further, the Reichswehr had avoided making any commitments in writing as regarded future purchases. While the small initial payments of 1922 went ahead, the 8 million Reichsmarks promised in 1924 was never delivered, nor were any new contracts forthcoming. Junkers found himself further and further in debt and unsure how to proceed

¹⁴⁵ Johnson, pp. 2-3.

¹⁴⁶ Ibid.

¹⁴⁷ “Junkers-Von Seeckt Correspondence,” March 25, 1924, RH 8, 3681, BA-MA, p. 1.

¹⁴⁸ Ibid.

¹⁴⁹ Ibid.

¹⁵⁰ Ibid.

in the collection of money owed by the Reichswehr. He was blocked from normal legal arbitration by the covert and secret nature of the Fili project. Instead, in 1925, he began hinting that he might be forced to make a public revelation of Seeckt's illegal military activity going on in Russia. Seeckt demurred, politely mixing offers of financial assistance with thinly veiled threats in his correspondence with Junkers for the next two years.¹⁵¹

After Junkers first threatened him with legal action in their last letter exchange of 1924, Seeckt replied harshly: "I have no doubt that every other German aircraft company would have taken the step [to work in Russia] under such conditions..."¹⁵² This was factually untrue, as AeroUnion had already turned the project down. Seeckt continued by accusing Junkers of being motivated by mere greed: "Which German aircraft manufacturer would not take this opportunity to free us from the constrictions of Versailles and continue working in this field... This letter indicates to me that you were guided not only by our national political interest, but that you also had a subsequent profitability of your company in mind."¹⁵³ Seeckt accused Junkers at length of mismanaging his company and failing to recognize the lack of a global market for his products. Junkers continued to claim that verbal agreements had been made two years prior, but the Reichswehr falsely denied any such conversation had taken place.

With Reichswehr purchase of Dutch aircraft, Junkers had lost a major contract upon which he had depended for the financial solvency of the Fili project. In addition, the

¹⁵¹ "Junkers-Von Seeckt Correspondence," 1926, RH 8, 3681, 1924-1926, BA-MA, pp. 1-4.

¹⁵² Ibid.

¹⁵³ "Junkers-Von Seeckt Correspondence," November 26, 1924, RH 8, 3681, BA-MA, p. 1.

Soviets were largely unhappy with the product that had been delivered, and refused to order more after the completion of their first order. Further, in 1925, the Reichswehr failed to deliver the 8 million Gold Reichsmarks promised. Despite frustrations, in June 1925, the RVS attempted to renegotiate the terms of the contract with Junkers which might have enabled Fili to remain solvent; the contract provided for the purchase of 120 aircraft and 150 motors, and a twelve-year extension of Junkers' contract with 20 percent profits per year "calculated into" the overall cost per aircraft.¹⁵⁴ The Politburo would later censure Rosengoltz for having offered such generous terms, noting that the Red Air Force "has been unconditionally accepting J[unkers] aircraft, despite the fact that they have not met the basic conditions of the air force. This mistake was caused by the desire of the RVS to keep the Junkers concession at all costs."¹⁵⁵ But Junkers turned down the agreement, offering a counterproposal that even the RVS considered unreasonable. Commissar for Defense Kliment Voroshilov then recommended that the contract be terminated.

Then on December 3, 1926, news of Junkers' activities was printed in the Manchester Guardian. Junkers himself was responsible for the leaked news.¹⁵⁶ The explosive nature of the revelations, and in particular their focus on the activities of Junkers Corporation, highlights that the crisis was one of Seeckt's own making. Between 1924 and 1926, the relationship between the Special Group and the Junkers Corporation

¹⁵⁴ Voroshilov, "Predmet: Iunkers [Subject: Junkers]," April 12, 1925, 4-2-90, l. 1, RGVA, p. 2

¹⁵⁵ "Postanovleniye Sekretariata TSK Po Delu o Kontsessii 'IUNKERSA' i Zagranichnykh Zagotovkakh UVVS s Utochneniyami, Vnesennymi, Soglasno Postanovleniyu PB TSK VKP b ot 4.3.26 g. pr. № 13 p. 13\», 4 Marta 1926, 17.3.550, L. 19, RGASPI, l. 1-7.

¹⁵⁶ Haigh, Morris, Peters, p. 171.

became increasingly acrimonious. The Russians continuously complained about the failure of the Junkers plant to produce aircraft up to contract standard, while the Junkers Corporation complained about the immense difficulties of manufacture and the failure of the German and Soviet governments to buy their production in quantities that would make Fili profitable.

In many respects, it is a surprise that such a revelation had not occurred earlier. German businessmen, shipping agents from a variety of countries, military staff members with strong Social Democratic ties and countless others could have made the revelation public. The breaking of the scandal in 1926 and the assurances of the German government that it would discontinue all such activities of the Reichswehr actually disarmed the rumor mill. After 1926, while rumors of German activities persisted, they were by and large dismissed by European newspapers that looked favorably on Foreign Minister Gustav Stresemann.

Junkers' Fili project has generally been considered a total failure by historians, but that attitude derives entirely from the German experience at Fili. It is true that the plant produced only a small portion of its planned aircraft, and relatively low quality ones at that. In total, during its two and a half years of operation, the Fili plant produced 150 aircraft of J-20 and J-21 design.¹⁵⁷ But that was something of an accomplishment, given the resource and manpower shortages facing Junkers, as well as the repeated failures of the Reichswehr to provide promised financial support. And to put Fili's production

¹⁵⁷ Bill Gunston, *The Osprey Encyclopedia of Russian Aircraft 1875–1995*, (London: Osprey, 1995).

figures into perspective, the entire Russian air force consisted of 173 aircraft in 1924.¹⁵⁸ Fili was an essential source of aircraft during its years of operation.

After halting production in 1926, Fili was officially turned over to the Soviet Union on March 1927. Per the concessionary agreement, the RVS paid Junkers three million gold rubles for all equipment on site.¹⁵⁹ But Fili continued to produce military equipment after March 1927. Some German representatives stayed in Russia at the plant after Junkers' withdrawal, and the factory eventually became quite successful under joint German and Soviet management. The head of the Soviet Air Force (who was also the head of the Soviet Union's aircraft industry) estimated that Fili was the fourth-most productive aviation facility in the Soviet Union at the end of 1925.¹⁶⁰ After upgrades and expansion after Junkers' departure, Fili began producing high quality BMW engines under license agreements with that German firm in 1927.¹⁶¹ As of 1931, the factory was still open to German visitors; at the time, it was producing Tupolev reconnaissance and bomber aircraft.¹⁶² The plant would go on to become the primary production center for Andrei Tupolev's aircraft designs. These, too, had their design origins at Fili: the first generation of Tupolev aircraft were derivatives of Junkers' duraluminum monoplane designs, some of which had been stolen from the plant by Soviet employees.¹⁶³ The first

¹⁵⁸ "Spravka o Vosdushnogo Flota Rossii," July 26, 1925, 4-2-14, l. 1, RGVA, p. 1.

¹⁵⁹ Ibid, p. 3; Aleksander Nekrich, *Pariahs, Partners, Predators: German Soviet Relations, 1922-1941* edited and translated by Gregory Freeze (New York: Columbia University Press, 1997), p. 30.

¹⁶⁰ "Programma Zavodov Aviatresta na 1927-1928," March 5, 1925, 4-2-457/461, l. 1, RGVA, p. 1.

¹⁶¹ "Bericht den Besuch des Flugzeugwerkes in Fili," February 17, 1931, RH/12/1, 56, BA-MA.

¹⁶² Ibid. After World War II, the facility switched production to astronautic technologies; it is now known as the Khrunichev State Research and Production Space Center.

¹⁶³ Paul Duffy and Andrei Kandalov, *Tupolev: The Man and His Aircraft* (Hong Kong: SAE Printing, 1996), p. 12.

fruit of Tupolev's design work, the TB-1, was the Soviet Union's first monoplane bomber. It was mass produced only at Fili beginning in 1928, as it was the only plant that could accommodate the complicated production work. Like earlier German designs produced at Fili, it was powered with a BMW VI engine.¹⁶⁴ So derivative was it of Junkers' designs that Hugo Junkers sued the Soviet Union in international court at The Hague for patent infringement.¹⁶⁵ For four years, Fili was the source of all of the Soviet Union's heavy bombers, which numbered 218 by 1932.¹⁶⁶ In other words, Fili provided the intellectual and physical capital necessary for the future expansion of the Soviet air force. Thus, while German expectations for the plant were in fact disappointed, Soviet aims, after considerable investment, were largely met.

The failure of the Fili Plant in 1926 represented a turning point in military cooperation between Germany and the Soviet Union. After 1926, Seeckt's vision of rebuilding German war industry in Russia was increasingly replaced by direct cooperation between the Red Army and the Reichswehr. The Reichswehr abandoned the difficult process of trying to find corporate partners willing to risk profit for the Reichswehr's long-term strategic interests. Further, the difficulties of controlling such partners and the impossibility of maintaining secrecy disinclined the Germans from using private ventures in the same way after 1926. Instead, the German Army began to send

¹⁶⁴ In 1929, the Soviets began to switch to much cheaper, domestically produced versions of the BMW engine under license agreement.

¹⁶⁵ Duffy, Kandalov, p. 12. Junkers lost, as Tupolev could claim a different production method and a slight increase in strength of his monoplane wing. Interestingly, Tupolev had gone on a study tour of German aviation plants during the time he was working on his design for the TB-1.

¹⁶⁶ Duffy, Kandalov, p. 37.

increasingly large numbers of its own officers and men to secret facilities established through direct negotiations with the Red Army.

THE SHIFT TOWARDS TECHNICAL AGREEMENTS, 1927-1933

In part because of the Junkers scandal, the Soviet Union moved away from its concessionary policies with the German government. The First Five Year plan effectively terminated the remaining concessionary agreements in the country, though a few lingered until 1929 or 1930.¹⁶⁷ Limited returns handicapped the interest of western firms in providing capital. And the political environment of the Soviet state was hardly receptive to their presence. As concessions declined, the hiring of foreign technical specialists and the initiation of technical assistance contracts increased. In 1926 “the total value of technological assistance agreements amounted to 2.16 million rubles, while in 1927-1928 it increased to 6 million rubles, and at the end of 1930...there were 124 technological aid contracts in force... amounting to 83 million rubles.”¹⁶⁸ This shift represented a movement away from German companies and towards American ones, although German business would remain the second largest source of capital and expertise in the technical aid contract era.

The technical assistance provided by German firms to Soviet war industry was enormous in scale, and played an essential role in the militarization of Soviet industry. Generally, these technical assistance contracts centered on the construction or

¹⁶⁷ Koves, p. 163.

¹⁶⁸ Ibid, p. 163.

refurbishment of industrial plant. This involved the arrival of skilled technicians, the importation of machine tools and the reorganization of plant management with the assistance of foreign specialists. In the 1920s, this process was dominated by German firms.¹⁶⁹ Of the eighteen tank production facilities active in the Soviet Union in 1941, two were modernized by German engineers and two – the Stalingrad Tractor Factory and the Gorki Automobile Factory – were built by American firms, but used imported German industrial plant. Three more factories were modernized under contract by American firms with German and American machine tools. Three others were built by Soviet construction crews, but equipped with German and American machine tools and factory components.¹⁷⁰ The bulk of the Soviet automotive and tank industry depended on German equipment or engineers.

German engineering played a similar role in Soviet aviation. In 1925, the Russians signed an agreement for aircraft engines with AeroUnion.¹⁷¹ At the time, Daimler AG was a leader in the field of aircraft engine design. In particular, the Russians were interested in acquiring the new BMW VI, which Daimler-Benz was manufacturing under a special contract with BMW.¹⁷² The BMW VI engine may not have been exclusively designed for military aircraft, but it was clearly designed with combat conditions in mind. A powerful V-12, water-cooled engine, it was used in numerous combat aircraft, including the world's first cantilever, monowing four engine bomber (the

¹⁶⁹ Increasingly, from 1930 onwards, American businesses came to play the leading role.

¹⁷⁰ Zaloga, Grandsen, pp. 43-44.

¹⁷¹ The Russians had already come to an agreement with Junkers regarding aircraft.

¹⁷² "Archivist's Note," June 3, 1970, ADB, p. 1.

T-3), one of aircraft engineer Andrei Tupolev's famous projects.¹⁷³ The BMW VI was also used in a wide range of combat aircraft built between 1925 and 1935 for the Reichswehr and the Soviet Air Force, including the Heinkel 45, 51, 60, 70, the Focke-Wulfe 42, the Dornier 10 and 17 and the Junkers 25.¹⁷⁴¹⁷⁵ Daimler developed plans to build its own 250 HP aircraft engine, alongside the BMW VI, in Russia in 1926, but production difficulties led to a new arrangement: BMW and Daimler instead signed license agreements with the Russian state whereby the engines would be built in Russian factories under German and Russian supervision beginning in 1926.¹⁷⁶ As a result, an entire generation of combat aircraft in Russia and Germany shared a BMW-designed power plant.

German industrial agreements also played a major role in Soviet naval design. In 1923, M.A.N., the company that had invented the diesel engine, signed its first contract with the Russian government. This arrangement, arranged by Lomonosov, also involved the sale of locomotives.¹⁷⁷ After this initial arrangement, however, M.A.N. expanded the scope of its Russian contracts considerably. M.A.N. had been the largest producer of the enormous diesel engines used to power German U-boats during World War I. However, U-boats fell into the restricted category of war materiel under the Treaty of Versailles and

¹⁷³ "Archivist's Note," June 3, 1970, ADB, p. 1. This was the successor to the TB-1 aircraft mentioned earlier.

¹⁷⁴ Enzo Angelucci, *McNally Encyclopedia Of Military Aircraft* (New York: Crescent Publishing, 1988).

¹⁷⁵ The Directorate of the USSR Air Forces was formed in March 1924; before that, Soviet military aviation fell under the Red Army Directorates.

¹⁷⁶ "Beziehungen der Daimler-Benz AG zu der UdSSR, 1917-1941," Box 79-82, compiled June 3, 1970, ADB, 1-2.

¹⁷⁷ "Anfertigung von Ersatzteilen für Dieselmotoren in Russland," and "Zusammenstellung der Lieferungen von ortsbeweglichen M.A.N.-Dieselmotoren im Vertretungsgebiet Russland (Ud.S.S.R.)," June 1933, Archiv M.A.N (AMAN), p. 1.

M.A.N. found itself without a market after the war. A solution presented itself in the Soviet Union. On March 3, 1925, M.A.N. signed a license agreement with the Gomzy Machine Factory in Moscow to begin producing diesel engines under contract.¹⁷⁸ The contract explicitly stated that the license agreement covered the use of three types of M.A.N. engines: “for fixed (i.e., factory) installation, for use in civilian ships and locomotives, as well as in submarines.”¹⁷⁹ M.A.N. would sell more than fifteen million gold marks worth of materiel to the Soviet Union between 1923 and 1930, including the engines to run the tractor (and later tank) factory Red October in Stalingrad.¹⁸⁰ In 1933, with Hitler in power, it expanded its sales and began openly selling submarine equipment to the Soviet Navy.¹⁸¹ Four classes of Soviet submarines – the Dekabrist, Pravda, Leninets and Stalinets – would be equipped with M.A.N. engines.¹⁸² As submarines constituted the bulk of Soviet naval power when World War II began, this represented a very significant technological exchange.¹⁸³

¹⁷⁸ “Anfertigung von Ersatzteilen für Dieselmotoren in Russland,” and “Zusammenstellung der Lieferungen von ortsbeweglichen M.A.N.-Dieselmotoren im Vertretungsgebiet Russland (Ud.S.S.R.),” p. 1.

¹⁷⁹ “Zentrale Verwaltung der Staatlichen Vereinigten Maschinenfabriken in Moskau (Gomzy),” in *Augsburger M.A.N.- Dieselmotoren: Lizenzvergaben in den Jahren 1918 bis 1978*, compiled by Dr.-Ing. D. Von Lassberg, 1978, Archiv M.A.N. AG., Augsburg (A-MAN).

¹⁸⁰, “Anfertigung von Ersatzteilen für Dieselmotoren in Russland,” and “Zusammenstellung der Lieferungen von ortsbeweglichen M.A.N.-Dieselmotoren im Vertretungsgebiet Russland (Ud.S.S.R.),“ June. 1933, A-MAN.

¹⁸¹ Ibid.

¹⁸² Tobias R. Philbin III, *The Lure of Neptune: German-Soviet Naval Collaboration and Ambitions, 1919-1941* (Columbia, SC: University of South Carolina Press, 1994), 21-22.

¹⁸³ Between AeroUnion and M.A.N., the Soviet Union received an influx of technology and technical assistance. The result was that in the 1920s, Soviet and German military technology converged, increasingly sharing design attributes and performance levels. In addition, German corporate activity proved vital to the expansion of Soviet military industry in the 1920s and 1930s. Without German investments, German engineers and German capital, the order of magnitude increase in Soviet military production that occurred between 1922 and 1939 would have been impossible. Much of that activity after 1926 became specifically linked with Soviet-German military facilities, a subject that will be explored in more detail elsewhere in this dissertation. On the role of German chemical industry in secret cooperation, see chapter three. For German industrial work with armored vehicles and tanks, see chapter four. For the

There were countless other military industrial projects performed by German firms. On June 17, 1929, the Soviet Main Concession Bureau agreed to terms with Krupp for the provision of technical assistance and machine tools to some of the Soviet Union's largest factories, including Barrikad, Krasnoe Sormovo and Elektrostal.¹⁸⁴ Specifically, their assistance was to improve steel casting and artillery production.¹⁸⁵ Rheinmetall reached a similar agreement to establish production of "artillery systems in the plant of a Soviet weapons conglomerate."¹⁸⁶ In 1930, RVS representative Khalepsky conducted negotiations with Rheinmetall, Krupp, Mafai, Daimler-Benz and Linke-Hoffman for technical or license agreements regarding tanks, artillery, armored cars, aircraft, rifles, as well as the temporary hiring of German engineers and the training of Soviet engineers in German plants.¹⁸⁷ The RVS also concluded contracts with M.A.N., Humboldt, Demag, Krup, Ehrhardt and Zemer for machinery exclusively for military industry.¹⁸⁸ Another Soviet agent in Germany reached agreements with Heinkel and BMW in the same year.¹⁸⁹ The total costs of importing prototypes and physical plant for military industry –

role of German aviation industry in Russia after Junkers' withdrawal, see chapter five. And for the role of German shipbuilding and ship-design firms in Russia, see chapter six. Without German investments, German engineers and German capital, the order of magnitude increase in Soviet military production that occurred between 1922 and 1939 would have been impossible.

¹⁸⁴ Nekrich, p. 24.

¹⁸⁵ Ibid.

¹⁸⁶ Ibid.

¹⁸⁷ I. Khalepsky, "Pismo, Tov. Voroshilovy [Letter to Comrade Voroshilov]," January 8, 1930, 33987-3c-350, l. 17, RGVA, pp. 103.

¹⁸⁸ "Postanovlenie No. 1148: Presidium VSNKh SSSR ot 3 Iulya, 1930 G [Resolution of the Supreme Economic Council of the Soviet Union from July 3, 1930]," 374-28-3384, p. 10, Gosudarstvennii Arkhiv Rossiiskoi Federatsii [State Archive of the Russian Federation, or GARF], p. 1.

¹⁸⁹ "Zatrati na Tekhpomoshch' v 1930-1931 g. [The Costs of Technical Assistance in 1930-1931]" September 9, 1930, 4/1/1462, RGVA, p. 1.

separate from technical agreements for work to be carried out inside the Soviet Union – totaled more than 18 million gold rubles in 1930 alone.¹⁹⁰

*CONCLUSION: THE ROLE OF GERMAN BUSINESS IN THE MILITARIZATION OF
SOVIET INDUSTRY*

How important was the Soviet-German corporate phase of military cooperation? Seeckt's vision of a vast network of factories funneling munitions to Germany never came true. Indeed, the only delivery of arms made from a German-run plant in the Soviet Union back to Germany before 1926 was the shipment of some 300,000 mortar shells.¹⁹¹ It is fair to say that the Germans gained relatively little from cooperation. Some firms turned a profit, but most did so under technical aid agreements signed after 1926. Many of those agreements were linked with joint Soviet-German military facilities; their role in chemical weaponry, armored vehicles, aviation and naval construction will be assessed in detail in future chapters.

However, a few general conclusions should be made here about the role that joint Soviet-German military-industrial projects had upon Soviet industrialization. It was considerable, and can be quantified in a number of ways. By 1931, annual trade between the two states topped one billion marks.¹⁹² In 1932, at the peak of the economic partnership, German goods accounted for 46 percent of the Soviet Union's total imports.¹⁹³ Much of this material, as noted earlier, was destined for war industries as part

¹⁹⁰ "Importnii Plan NKVMora Na 1930/1931," September 9, 1930, 4/1/1462, RGVA, pp. 1-3.

¹⁹¹ Haigh, Morris, Peters, p. 170.

¹⁹² Mitchell, p. 612.

¹⁹³ Haigh, Morris, Peters, p. 138.

of Stalin's First Five Year plan. More concretely, the role of German engineers in Soviet tank, aircraft and chemical production was staggering. In 1930, German engineers and chemists were managing half of the Soviet Union's chemical weapons production.¹⁹⁴ In aviation, armored warfare and submarines, German industrial assistance proved vital in the creation of Soviet productive capacity. Further, technical assistance contracts with Germany led the Soviets to imitate German military designs, particularly in aircraft and ship design.¹⁹⁵ The success of the Soviet Union in developing its war industries with German assistance had a dark side, however: dependence.

Perhaps the truest measure of Soviet dependence on German engineering and industry was demonstrated in 1939, *before* the signing of the Molotov-Ribbentrop Pact. In January of that year, Voroshilov sent Mikoyan, then managing foreign trade, a list of the Red Army's requested annual purchases to be made from German military industry.¹⁹⁶ The final proposal stretched to 17 pages. The Soviet Air Force alone requested from German industry four complete fighter and bomber prototypes, seven engine designs, thirteen different machine gun and bomb designs, nine types of laboratory equipment, and ten kinds of optical and electrical equipment. The total list included 112 items. Many of the items listed were not just component parts, but entire

¹⁹⁴ This statistic is drawn from Joachim Krause and Charles K. Mallory's *Chemical Weapons in Soviet Military Doctrine: Military and Historical Experience, 1915-1991* (Boulder, CO: Westview Press, 1992). See in particular Appendix B. And, Keith Dexter and Ivan Rodionov, *The Factories, Research and Design Establishments of the*

Soviet Defence Industry: A Guide, The University of Warwick, Department of Economics Digital Publications, 2015, <http://www2.warwick.ac.uk/fac/soc/economics/staff/mharrison/vpk/data/>

¹⁹⁵ The details of this technical "borrowing" in chemical warfare, armored warfare, aviation and naval technology are each explored in more detail in the chapters that follow.

¹⁹⁶ "Zamestitelyu Predsedatelya Soveta Narodnykh Komissarov SSSR, Tov. Mikoyanu, [To Deputy Chairman of the Council of People's Commissars, Comrade Mikoyan]" January 28, 1939, 33987-3s-1237 (1), l. 43, RGVA, p.1.

weapons systems, including five different bores of artillery, armored vehicles and aircraft. The fact that the Red Army would even present such a list to German trade representatives during the 1939 war scare shows how essential German designs and expertise remained for Soviet military industry. That dependency developed in the 1920s, as Soviet military industry matured.

In the context of the broader Soviet-German relationship, military industrial cooperation between Germany and the Soviet Union precipitated a major shift in the nature of their relationship. After December 1926, the Manchester Guardian scandal forced a reassessment of cooperation. In early 1927, the Soviet Union issued an ultimatum to General Heye (Seeckt's replacement) that the Reichswehr inform the German government of its relationship with the Red Army, and thus establish a "legal basis" for cooperation.¹⁹⁷ On May 18, 1927, Stresemann, Gessler, General Heye and the head of the Troop Office, Colonel von Blomberg, met in Berlin. There, Stresemann was for the first time included on the military's plans in Russia.¹⁹⁸ But to the surprise of many in the Reichswehr, Foreign Minister Stresemann, the major figure in the government in 1927, acquiesced to their plans.

The sudden improvement of relations between the German Foreign Ministry and the Reichswehr that followed led to a significant expansion of cooperation. With important civilian leaders now included on the Reichswehr's plans, suspicion towards the

¹⁹⁷ Carsten, p. 274. Specifically, the German military sought to press ahead with the construction of a joint tank facility; the Soviet Union would not agree unless the German Foreign Office was included.

¹⁹⁸ Stresemann was unhappy that the military wanted to send active officers to Russia – if the men being trained in Russia had no prior military service, technically it would not violate the Treaty of Versailles. The Reichswehr ignored him and dispatched 43 active duty officers to Lipetsk. (Carsten, pp. 277-284.

military declined and the military's budget increased significantly, from 459 million Reichsmarks in 1924 to 728 million in 1928.¹⁹⁹ And with the highly competent Stresemann informed, the Foreign Office proved far better at hiding the Reichswehr's illegal activities in Russia. Discarding Seeckt's plans for vast military-industrial projects, the new Reichswehr leadership, in conjunction with an eager Red Army, began to focus their efforts on the construction of a series of joint facilities. These bases, factories and laboratories were designed to provide both militaries with a new generation of officers and technologies. In this they succeeded, producing many of the warriors and weapons of the Second World War.

¹⁹⁹ Carsten, p. 275.

CHAPTER THREE – EXPERIMENTING WITH MASS DESTRUCTION

THE BIRTH OF GAS WARFARE

On April 22, 1915, near the Belgian town of Ypres, soldiers of a French colonial division were just getting used to life in the trenches. As the sun began to sink towards the horizon, soldiers witnessed a strange sight on the horizon: a large greenish fog drifting slowly towards them. Carried by a pleasant spring breeze, it took only sixty seconds for the first wave of chlorine to cross no-mans-land:

Utterly unprepared for what was to come, the [French] divisions gazed for a short while spellbound at the strange phenomenon they saw coming slowly toward them. Like some liquid the heavy-coloured vapour poured relentlessly into the trenches, filled them, and passed on. For a few seconds nothing happened; the sweet-smelling stuff merely tickled their nostrils; they failed to realize the danger. Then, with inconceivable rapidity, the gas worked, and blind panic spread. Hundreds, after a dreadful fight for air, became unconscious and died where they lay - a death of hideous torture, with the frothing bubbles gurgling in their throats and the foul liquid welling up in their lungs.²⁰⁰

Ypres was not the first use of chemical weapons [CW] in the war, but by far the deadliest. Germany and France had both attempted to weaponize tear gas in the opening months of the war, with little effect. A German effort to use a tearing agent (xyxyl bromide) as part of a bombardment failed on the Eastern Front due to extreme cold. Tear gas, an irritant, could be used with relative moral ease. Given that it was employed with some frequency against civilians during riots, its transition to the battlefield was not shocking. But the chlorine used by the Germans in April 1915 was a different matter.

²⁰⁰*The Great Events of the Great War: A Comprehensive and Readable Source Record of the World's Great War, Vol. III*, Edited by Charles F. Horn (New York: JJ Little and Ives Publishing, 1920), p. 146.

Contrary to popular perception, death by chlorine is not caused by a lack of air: “chlorine does not suffocate: it poisons, stripping the lining of the bronchial tubes and lungs. The inflammation produces a massive amount of fluid that blocks the windpipe, froths from the mouth and fills the lungs.”²⁰¹ In essence, victims drowned in their own fluids. Sometimes it killed quickly, especially if a victim had a high heart rate and was inhaling deeply – for instance, those who tried to run from the gas clouds. For those who hunkered down and buried their heads in mud or water, death could be less swift. If it settled in the lungs in a less than immediately lethal dose, chlorine took days of slow strangulation to finish off its victims. The French suffered fifteen thousand casualties from the first German chlorine attack.²⁰² Another five thousand British soldiers would die two days later from a second deployment. In the British units hit by the gas, 60 percent of those affected were so badly injured that they had to be sent home. Of those, “half were still fully disabled at the end of the war.”²⁰³

This was just the first taste of chemical warfare. The genius behind chlorine gas (codenamed *Grünkreuz*, or Green Cross) was Professor Fritz Haber, a future Nobel Prize winner in chemistry. Haber, one of Germany’s most famous chemists and head of the Kaiser Wilhelm Institute for Physical Chemistry and Electrochemistry (KWI-PCE), became head of the Chemistry Section of the German Ministry of War nearly as soon as the war began.²⁰⁴ In that position, he personally developed chlorine, visiting the

²⁰¹ Robert Harris and Jeremy Paxman, *A Higher Form of Killing: The Secret History of Chemical and Biological Warfare* (New York: Random House Trade Books, 2002), p. 2

²⁰² *Ibid.*, p. 4.

²⁰³ *Ibid.*

²⁰⁴ Dietrich Stolzenberg, *Fritz Haber: Chemist, Nobel Laureate, German, Jew* (Philadelphia, PA: Chemical Heritage Press, 2004), pp. 109, 129.

battlefield at Ypres to supervise its deployment and to watch its effects. Despite the immense suffering inflicted, chlorine failed to provide Germany with the strategic success for which Haber had worked. Instead of questioning the use of chemical weapons, Haber concluded that chlorine was not an ideal weapon. First, it was clearly visible, providing warning to any troops it might be used against. Second, it was water soluble, meaning that wet or urine-soaked rags could protect against its full effect.

A chemical weapons arms race now began. As gas masks and other defensive technologies improved, each side sought new agents to circumvent them. Germany had the advantage, as its chemical industry was the best in the world: in 1913, the German chemical-dye industry controlled nearly 90 percent of the global market.²⁰⁵ The Germans' early weaponization work under Haber had given them the early lead. Competing with Haber in France was a team headed by Nobel laureate Francois Victor Grignard.²⁰⁶ The British, for their part, built an enormous facility at Porton Down to test and develop chemical agents under the direction of Colonel Stuart Rawlins, an artillery officer.²⁰⁷ The Germans remained five to six months ahead of the Allies in research and production during the early years of the war: they used chlorine first in April 1915; the Allies responded with their first chlorine attack in late September of that year. Both sides arrived at the conclusion in 1915 that a new agent called "phosgene" was the logical

²⁰⁵ Joachim Krause and Charles K. Mallory, *Chemical Weapons in Soviet Military Doctrine: Military and Historical Experience, 1915-1991* (Boulder, CO: Westview Press, 1992), p. 37.

²⁰⁶ "Victor Grignard," in *A Dictionary of Science* (Oxford, UK: Oxford University Press, 2002), p. 370.

²⁰⁷ For the full history of Porton Down, see its official history: G.B. Carter, *Chemical and Biological Defence at Porton Down, 1916-2000* (Norwich: The Stationery Office, 2000).

successor to chlorine. The Germans deployed phosgene in December 1915; the Allies in June 1916.

In the early morning hours of December 19, 1915 near Ypres, alarm bells sounded along the British trenches. Timed with a particularly strong wind, a largely invisible cloud of chlorine-phosgene mix had swirled over British trenches, taking most of the frontline soldiers entirely unawares. A thousand soldiers died within minutes, but many of the survivors seemed relatively unaffected by the gas attack they had just experienced. Little did they know that phosgene, the agent to which they had just been exposed, was far deadlier than chlorine and killed in even more horrific ways. Phosgene was

eighteen times as powerful as chlorine, practically colourless and odorless and much more difficult to detect. Effective in concentrations of just one part in 50,000 it had a deadly delayed action. A victim who has inhaled a lethal dose at first feels nothing more than a mild irritation of the eyes and throat which quickly passes off; for up to two days afterwards a man might actually feel mildly euphoric. Throughout this period his lungs are filling with fluid. Collapse comes quickly...the 'drowning period' begins. Official reports describe an abundant flow of thin watery fluid, often streaked with blood, which simply flows from the mouth as the dying patient loses the power to expel it. After death, the foam from this fluid may dry to a white efflorescence around the mouth. Victims were known to cough up four pints of this yellowish liquid every hour; it could take up to forty-eight hours to die.²⁰⁸

Phosgene (and its subsequent variants) was the deadliest of the chemical agents used during World War I, with the highest mortality rates among the gasses employed during the war.²⁰⁹

²⁰⁸ Harris, Paxman, p. 18.

²⁰⁹ Dieter Martinetz, *Der Gaskrieg, 1914-1918: Entwicklung, Herstellung und Einsatz Chemischer Kampfstoffe [The Gas War, 1914-1918: The Development, Production and Use of Chemical Weapons]* (Bonn: Bernard und Graefe Verlag, 1996), pp. 127-131.

The next round of development in chemical warfare was the most infamous. On 12 July, 1917, near Ypres (yet again), a horrific new agent made its appearance. Hoping to break the war open in a single decisive moment, the Germans had stored huge quantities of their new chemical weapon, codenamed *Gelbkreuz* (Yellow Cross). A fierce bombardment during the night had proven a rather strange experience for British troops of the 15th and 55th Divisions.²¹⁰ They had suspected they were getting gassed based on the lack of high explosive shells, but the canisters fired at them instead contained a brownish liquid that pooled on the ground and in the trenches. It caused little pain on initial contact, and the soldiers at the front felt a great sense of relief upon realizing the substance was not phosgene. That would soon change.

In the early hours of the morning they began to wake up with ‘intolerable pain’ in the eyes...then they began to vomit uncontrollably. As the night wore on, the pain in the eyes became so intense that many had to be given morphia. The following day the sun rose on an army that looked as if it had been stricken by some biblical plague.²¹¹

This toxic substance seeped through clothing and ate away at the skin, creating huge blisters and painful swelling as layers of skin sloughed off. But the real damage was done to the lungs, as men’s windpipes slowly constricted and they suffocated over days. It had the added attribute of remaining toxic for extremely long periods: so powerful was it that British doctors suffered ill effects from the agent after dissecting a deceased man who had been gassed ten days earlier.²¹²

²¹⁰ Harris, Paxman, p. 24.

²¹¹ Ibid.

²¹² Ibid, p. 26.

The new chemical weapon went under a variety of names. In France and Russia, it was Yperite, for the place it had first been used. In Great Britain, it went by mustard gas. Unlike phosgene, mustard gas wounded and disabled far more than it killed. Only 1.5 percent of those gassed died, though more than 125,000 would be wounded and many of those permanently disabled.²¹³ But the horrific physical scarring, the blindness and permanent respiratory damage inflicted by the new agent left it with the most feared reputation of the chemical agents used during the war. It took the British almost a year to synthesize their own version, in time for the 100 Days' Offensive in the summer of 1918.²¹⁴

Chlorine, phosgene, mustard gas and lachrymatory agents (tear gas) accounted for most of the chemical agents used during the war. By 1918, they were being used in enormous quantities: between one fifth and one third of all shells used in the last year of the war were gas shells.²¹⁵ At least one sixth of all casualties during the same period were gas casualties. For various reasons, the major combatant powers downplayed the effect of gas weapons and did not list gas casualties separately in public statistics. They viewed the potential panic at home, fears of revealing their own chemical stockpiles and the ethical issues that dogged the use of gas as problematic. Despite the lack of good statistics, it is estimated that at least 1.3 million men became gas casualties during the war.²¹⁶ Russian soldiers suffered the most of any army – at least 475,000 soldiers in the Tsarist army became gas casualties. The lack of a strong chemical industry meant Russia only

²¹³ Harris, Paxman, p. 26.

²¹⁴ Martinetz, p. 88.

²¹⁵ Ibid, p. 26.

²¹⁶ Harris, Paxman, p. 32; Martinetz, p. 129.

deployed small quantities of gas themselves. And the failure to provide even rudimentary countermeasures to Russian soldiers meant that the death rate from gas exposure was far higher in the Tsar's armies than on the Western Front: 11.8 percent versus 4.2 percent in the Allied Armies.²¹⁷

THE GERMAN CHEMICAL WEAPONS PROGRAM, 1919-1923

Germany entered World War I with the world's most advanced chemical industry. It also possessed the Kaiser Wilhelm Institute for Physical Chemistry and Electrochemistry in Berlin-Dahlem (*KWI-PCE*), where director Fritz Haber had assembled a brilliant team of chemists.²¹⁸ Haber was first appointed to the chemistry department of the "Board of Wartime Raw Materials" in 1914 to help solve the nitrate crisis in the German munitions industry. He simultaneously and independently pursued CW research through his institute, receiving the rank of Captain for his efforts in 1915. In his role as head of the Chemistry Department, Haber built an organization of nine sub-departments with hundreds of staff, recommended military officers for transfer to "Pioneer Regiments 35 and 36" (the first gas warfare regiments) and brought together many of the world's leading chemists to assist in his work. Researchers included three future Nobel Prize winners, Hans Geiger (inventor of the Geiger Counter and discoverer of the nucleus of the atom), and Burkhardt Helferich, a famed organic chemist and future

²¹⁷ Györgyi Vásárhelyi, László Földi, "History of Russia's Chemical Weapons," *The Journal of Academic and Applied Research in Military Science*, Vol. 6, No. 1 (2007), pp. 135–146.

²¹⁸ Stolzenberg, p. 114. Haber recruited far and wide for his institute and for the other Kaiser Wilhelm Institutes in Berlin. Among those he helped bring to Berlin was the 34-year old Albert Einstein, who would head the Kaiser Wilhelm Institute for Physics.

president of the *Gesellschaft Deutscher Chemiker* (the German Chemistry Society).²¹⁹ In 1916, the German CW program's Berlin facilities employed 150 scientists and 1300 military officers, soldiers and civilian personnel, as well as – indirectly – thousands of civilian workers.²²⁰ The network Haber built also included close ties to German industry. In particular, Haber worked with the Auer Corporation to manufacture gas masks and deterrents, and BASF and Bayer in the production of chemical agents. The latter two firms, having lost much of their international dye market, were more than eager to assist.²²¹

While Germany's chemical weapons program may have prolonged the war (and certainly increased the suffering of combatants), it did not produce the decisive outcome for which Haber had hoped. But even with defeat approaching, Haber contemplated the possibilities of gas warfare in the future. In October 1918, Haber managed to convince the German Ministry of War to transfer six million marks to his institute to continue work on military technology.²²² Specifically, this money was intended to maintain German expertise in chemical warfare after German defeat. These funds were concealed from the victorious allies and supported Haber's work until 1920.²²³

The need for concealment proved well-founded. With the end of the war, the victorious Entente sought to destroy the German chemical weapons program. On June 28,

²¹⁹ Stolzenberg, pp. 133-137.

²²⁰ Ibid, pp. 139-140. The size of the German program near Berlin was roughly the same in size and scope as the British program centered at Porton Down, which employed 1749 civilian and military personnel by war's end. (G.B. Carter, *Chemical and Biological Defence at Porton Down, 1916-2000* (Norwich, UK: The Stationery Office, 2000), p. 21.

²²¹ Stolzenberg, pp. 140-141.

²²² Ibid, pp. 148-9.

²²³ Ibid, p. 149.

1919, the Treaty of Versailles was signed in Paris. Its Article 171 banned the use of gas weapons, their manufacture, purchase or storage by the German government.²²⁴ Article 172 required the German government to “disclose to the Governments of the Principal Allied and Associated Powers the nature and mode of manufacture of all explosives, toxic substances or other like chemical preparations used by them in the war or prepared by them for the purpose of being so used.”²²⁵

In addition, the Allies declared Haber and a number of his senior team members to be war criminals and sought their arrest and extradition.²²⁶ Haber fled to Switzerland with his second wife and managed to avoid arrest. Some of his team members fled as far abroad as Japan and South America, where they continued their work. But efforts to apprehend the authors of gas warfare in World War I were undermined from the outset: Haber received Nobel Prize in 1919, which forced the Allies to rescind his status as war criminal.²²⁷ He returned to Germany later that year to play a central role in defeating Allied attempts to dismantle the German chemical weapons program.

As soon as the Treaty of Versailles had been signed, the Inter-Allied Military Control Commission (IAMCC) began its work in dismantling the German chemical industry, with a particular eye towards its gas warfare program. But thanks to a combination of deflection and German Ministry of Defense efforts, it was not until 1922 that the IAMCC began its full inquiry. And its start was not auspicious. British

²²⁴ Treaty of Versailles, “Article 171.”

²²⁵ Treaty of Versailles, “Article 172.”

²²⁶ Stolzenberg, p. 150.

²²⁷ The 1918 prize was awarded in 1919 for his work on nitrogen fixation, a process of extracting nitrogen from air essential to fertilizer – and explosives – production. Without nitrogen fixation, the later “Green Revolution” would have been impossible. Haber received the prize in Stockholm on June 3, 1920.

commissioner Sir Harold Hartley approached Haber that year to demand he hand over all materials related to the German CW program. After a curt greeting, Haber started their conversation by saying “Why didn’t you come sooner? I wanted to discuss all our documents with you, but there was a very unfortunate fire and they were all destroyed.”²²⁸ The Germans successfully concealed the extent to which their CW program had survived intact after the war.

At the end of 1918, Haber’s network of scientists and corporate partners had gone underground and continued much of their work. Besides Haber, the key figure in this transition was Hugo Stolzenberg. In 1916, Stolzenberg, a young army officer recuperating from severe wounds suffered at the front, had been approached by Haber. Stolzenberg’s background as a research assistant at the Chemical Institute at the University of Breslau recommended him to Haber; his management skills would lead to rapid promotion within Germany’s CW program.²²⁹ Stolzenberg worked first in Haber’s laboratory, then managed a gas shell filling plant near Berlin, then transitioned to managing a vital portion of Germany’s mustard gas program at Breloh.²³⁰

After the war, Stolzenberg left the military and started a private chemical business, the *Chemische Fabrik Stoltzenberg* in Hamburg. This firm had the advantage of being largely out of the reach of the IAMCC; at the time, Entente forces occupied the Rhineland where most of Germany’s chemical industry was based. This fact, coupled with Haber’s ties to German industry and the post-war military, meant major contracts for

²²⁸ Harold Hartley, “Speech at the Royal Society Club Dinner,” 14 November 1968, Notes and Records of the Royal Society of London, 24:1 (June 1969),” Cited by Stolzenberg, p. 162.

²²⁹ Stolzenberg, p. 145.

²³⁰ Ibid, p. 145.

Stolzenberg. In 1920, Haber directed a large Reichswehr “decontamination” contract to the Stolzenberg’s firm. Ironically, the task was to decommission the very Breloh mustard gas plant he had helped to build and manage during the war.²³¹ Under the nose of Allied inspectors, Stolzenberg smuggled crucial chemical warfare agents from Breloh to his own firm’s depots, rather than destroying them as he had ostensibly been hired to do.²³²

This secret CW reserve would prove its value in short order. In 1921, the Spanish government quietly approached Fritz Haber for assistance in procuring chemical weapons. Haber relayed the information to Stolzenberg and to the Reichswehr. In November 1921, Stolzenberg traveled to Spain. In January 1922 he signed a contractual agreement for the provision of chemical war materiel and the construction of a production facility in Spain.²³³ Most of the weapons shipped to Spain in 1922 and 1923 were from Germany’s wartime reserves, supposedly destroyed by Stolzenberg’s firm. As this supply reached exhaustion, Stolzenberg managed the construction of a mustard gas production facility entitled La Mariñosa, at Melilla, in Spanish North Africa.²³⁴ His influence in Spain reached the highest levels of government; he would personally brief Spain’s military dictator, Primo de Rivera, and Spain’s king, Alfonso XIII, on the use of CW against the rebels of the Riffian Republic.²³⁵

²³¹ Stolzenberg, p. 163.

²³² Ibid.

²³³ Ibid, p. 164.

²³⁴ For a more on the German chemical weapon projects in Spain, see the following section. For more on Stolzenberg’s work in Morocco, see Rudibert Kunz and Rolf-Dieter Müller, *Giftgas Gegen Abd El Krim: Deutschland, Spanien und der Gaskrieg in Spanisch-marokko, 1922-1927* [Poison Gas Against Abd El Krim: Germany, Spain and the Gas War in Spanish Morocco, 1922-1927] (Mannheim: Rombach, 1990).

²³⁵ Gorlov, p. 164.

Stolzenberg was particularly encouraged by the Reichswehr to build chemical air bombs for the Spanish military, an area of critical interest for the German military. His findings were reported back to the Reichswehr's *Inspektion für Waffen und Gerät* (Inspectorate for Weapons and Equipment, or *IWG*), which paid close attention to his work in Spain. An IWG report from July 24, 1924 noted that

In the absence of bomb production within Germany, the state of things has progressed less here. With the assistance of the *IWG*, Stolzenberg's Firm has been producing gas bombs for the campaign in [the Spanish] Marche equipped with a light set of explosives for the better distribution of gas effect. With regards of the effectiveness of these tests, the company seems not to be satisfied.²³⁶

Stolzenberg had concluded, however, that the lack of satisfactory results was mostly a product of Spanish tactical errors in the deployment of the weapons.²³⁷ His continued reports from Spain encouraged IWG in their pursuit of chemical aviation.

The smooth cooperation between Haber, Stolzenberg and the Reichswehr exemplified in Spain would evolve into an important part of Soviet-German cooperation. Beginning in January 1923, the Soviet military sought to place large armaments orders with German firms. In several areas, including chemical weapons, the work of the IAMCC made large scale munitions production nearly impossible. Otto Hasse, at that time heading the Reichswehr's Ordinance Office (TA-1), approached Haber to discuss whether or not it was realistic to establish chemical weapons production facilities in Russia.²³⁸ Haber brought up Stolzenberg's work in Spain and put Hasse in touch with him.

²³⁶ "Fl. Nachricht Nr. 3 [Fl. Report Nr. 3]," 24 July, 1924, RH/2/2216/319-327, Bundesarchiv-Militärarchiv, Freiburg-Im-Breisgau [BA-MA], pp. 1-5.

²³⁷ *Ibid.*

²³⁸ Stolzenberg, p. 166.

Haber also took the additional step of reaching out to the Soviets. In March 1923, Haber – in his role as head of the *Deutsche Chemische Gesellschaft* [The German Chemical Society] – invited Vladimir Ipatieff, the Russian scientist then functionally heading the Soviet chemical weapons program, to deliver a lecture in Berlin.²³⁹ In a private conversation, the two men discussed the possibility of building up the chemical weapons industry in Russia. Ipatieff, upon his return to Russia, played a role in gaining the approval of the Red Army for a visit by Stolzenberg. He arrived in April 1923.²⁴⁰ By the end of his six-week trip, Stolzenberg and the Red Army had arrived at the basic terms of a contract to construct a joint chemical weapons plant in the environs of Samara Oblast, some 1000 kilometers east-southeast of Moscow. This preliminary agreement, officially signed on May 15, 1923, laid out plans for a German-managed, Russian-staffed chemical weapons plant deep inside the Soviet Union.²⁴¹ It was the beginning of an intimate relationship between the German and Soviet chemical weapons programs.

STOLZENBERG AND BERSOL

Five thousand kilometers from Berlin, in the town of Volsk in Samara Oblast, major work was underway on the facilities that would become the heart of the Soviet chemical weapons program. In 1920, two large *arteli* (unions) of construction workers began assembling dormitories, several chemical plants and a number of auxiliary

²³⁹ The name of the German Chemical Society changed slightly in 1949, hence the different word order. Stolzenberg, p. 166.

²⁴⁰ Stolzenberg, p. 166.

²⁴¹ Ibid. The Red Army and the Reichswehr would have equal access to the military materiel to be produced at the plant. “V Samarskiy GubKomGosOr [To the Head Government Organ Committee of Samara]” 16-6-1921, P-24-5-331, L. 1, TsGASO, I. 1.a

buildings in settlement of Ivashchenko, a town 40 kilometers from Samara.²⁴² The “Bertoletovoy Soli” Facility, or *Bersol* (the Russian term for potassium chlorate) was designed to produce a compound with a broad array of industrial applications, including the production of plastic explosives and percussion caps. It was to this facility that Stolzenberg and a colleague made a trip in the spring of 1923. The site enjoyed the benefits of good rail access, plentiful water, and workers already on site.

As noted in chapter two, as part of General Seeckt’s Eastern vision, on August 9, 1923, the German Ministry of War created *Gesellschaft zur Forderung Gewerblicher Unternehmungen* (the Society for the Promotion of Industrial Products, or *GEFU*).²⁴³ Capitalized with 75 million gold Reichsmarks, *GEFU*’s primary function was to invest in Soviet military industry and assist German companies in establishing production facilities inside the Soviet Union. Along with the Junkers aviation plant at Fili, *Bersol* was one of its first major projects. On September 18, Stolzenberg submitted a budget request to *GEFU* for the sum of 5.6 million gold rubles to update the facility and get it operational.²⁴⁴

On September 27, 1923, representatives from both sides assembled in Moscow. These included engineer Adadurov, representing *Metachim* (the Soviet state agency for metal and chemical production); V.I. Ipatieff for the Soviet military (as yet without an official chemical weapons division); Officers Eckhardt and Tschunke, representing *GEFU*, (and the Reichswehr); and Hugo Stolzenberg, joined by a staff member from his

²⁴² “Poisku k Zavodu *Bersol* [Finding for the *Bersol* Plant],” March 25, 1926, 357-43-112, l. 1-2, Tsentralny Gosudarstvenny Arkhiv Samarskoi Oblasti [TsGASO], pp. 1-2.

²⁴³ Gorlov, p. 104.

²⁴⁴ Zeidler, p. 8.

Hamburg office. They formalized an agreement to produce a variety of industrial chemicals, including “sulfuric acid, caustic soda, bleach, liquid chlorine and superphosphate.”²⁴⁵ But the primary goal of *Bersol* would be the production of “mustard gas and phosgene.”²⁴⁶ As Sergei Gorlov wrote, “the production of chemical shells was the main objective, and the production of peaceful chemical products only occurred in passing, mainly for the purpose of [hiding the] conspiracy.”²⁴⁷ The contract stated that mass production would begin no later than May 15, 1924, or about six months after their agreement.²⁴⁸ The planned scale of this enterprise was breathtaking: the 1923 contract stated that *Bersol* would produce half a million gas shells a year.²⁴⁹ The contract also called for the production of seven chemical agents in large quantities, beginning with initial annual production of around 525 tons.²⁵⁰ Five of these chemicals had industrial or agricultural use; the other two – mustard gas and phosgene – had use only as chemical weapons. *GEFU* and *Metachim* created a joint legal framework by established a holding company, also entitled “*Bersol*.” Its board was to be composed of two Soviet and two German representatives.²⁵¹ The two sides contributed considerable capital to bankroll the project: the Soviets provided 5.88 million gold rubles and the Germans 4.46 million.²⁵²

Stolzenberg enthusiastically embraced the project, investing 3.5 million gold rubles personally from his own business back in Germany. By 1924, he had more than

²⁴⁵ Gorlov, p. 104.

²⁴⁶ *Ibid.*, p. 104.

²⁴⁷ *Ibid.*

²⁴⁸ *Ibid.*

²⁴⁹ *Ibid.*, p. 105.

²⁵⁰ *Ibid.*, p. 104-5.

²⁵¹ Zeidler, p. 82.

²⁵² Gorlov, p. 104.

1,400 employees and two plants undergoing updating near Samara.²⁵³ Unfortunately, he ran into many of the same problems that Soviet industry elsewhere encountered: a lack of skilled labor, supply problems, and a shortage of heavy machinery.²⁵⁴ The latter, all of which had to be imported from Germany, delayed the plant's operations by nine months.²⁵⁵ Stolzenberg claimed that more than 75 percent of the material at the primary *Bersol* plant near Ivashchenko required replacement or updating.²⁵⁶ Stolzenberg also hired 30 to 40 skilled German workers to come in as managers, paying them a premium for their discretion and the hazard of working with chemical agents.²⁵⁷ One noted that when he was engaged by Stolzenberg's firm, he was told that he would receive a good salary if he remained silent, but that if the workers "sent something home in writing, we might not be taken back out of Russia alive... [And if we were] they would process us for

²⁵³ Gorlov, p. 104.

²⁵⁴ The Russian workers on site were very closely monitored by the Inspector of Labor for Trotsk Raion. In addition to frequent inspections, Stolzenberg had to report such minutiae as the causes for any minute of overtime over 8 hours a day. For instance, he had to report to the Inspector when a fan and motor, essential for keeping the facility safe, broke and had to be repaired on an emergency basis, requiring four hours of overtime. "Firma Stolzenberg, Pismo, Inspektoru Truda [Stolzenberg Firm, letter to the Inspector of Labor]," May 4, 1925, 818-3-96, l. 101, TsGASO, l. 1.

²⁵⁵ Gorlov, p. 106.

²⁵⁶ *Ibid.*, p. 104-5. It is interesting to note that several German corporations, Siemens and Rudolf Meier, became privy to this secret project through this updating process; through that work, they would become more intimate participants in secret rearmament. "Die Giftgasfabrik in Trotsk [The Chemical Weapons Factory in Trotsk]," *Vorwärts*, January 11, 1927, PA-AA, R 31493K, K 097076, p. 1. This interview is drawn from the Social Democratic Newspaper in Germany, *Vorwärts*, and normally might be considered unreliable. However, the extensive knowledge of the interviewer, which neatly aligns with materials in the German and Russian military archives, lends it credence. In addition, I found this article itself in the German Foreign Ministry Archives with notes suggesting that the interview was of concern to the German Government because of its factual accuracy. The interviewee notes that he is only revealing information because he had not been paid and the company that had hired him – GEFU – no longer existed.

²⁵⁷ "Die Giftgasfabrik in Trotsk [The Chemical Weapons Factory in Trotsk]", p. 1. By 1925, there were approximately 50 workers working just on superphosphates, so the total of Russian and German workers was significantly higher than 40. "Zavkom Khimikov [The Factory Committee of Chemists]," 17.3.1925. 818-3-96, l. 69, TsGASO, l. 1.

treason back in Germany.”²⁵⁸

Due to the extensive updating required, the factory’s opening soon fell behind schedule. By 1925, the plant was only producing superphosphates (a fertilizing agent) and small quantities of phosgene.²⁵⁹ Frustrated by the slow progress at the facility, Soviet representatives, led by the chemist Dr. V.N. Ipatieff, visited the plant, and noted that it appeared unsafe and totally unfit for mass production of chemical agents.²⁶⁰

Then further disaster struck. In May 1926, the Volga flooded its banks. As one German worker recounted, “The whole factory stood under water for weeks. There was a great danger that the two tons of phosgene that had already been produced might break out from their containers.”²⁶¹ As frustration mounted, the Soviets requested that the Reichswehr take over some of the responsibility of management and production at *Bersol*. Tschunke and his superiors demurred. Before the flood, Ivashchenko had finally begun to produce the requisite chemical agents, but not in the huge quantities desired by the Soviet Revolutionary Military Council (RVS); their patience was exhausted. A few weeks after the flood, *Metachim* began deporting all of the German workers from the

²⁵⁸ “Die Giftgasfabrik in Trotsk [The Chemical Weapons Factory in Trotsk],” p. 1. Perhaps not surprisingly, this information leaked, initially through a Social Democrat in the Reichstag, and then in a growing stream of newspaper articles. The “Trotsk Poison Gas Scandal,” which broke just weeks after the Junkers scandal, resulted in the “political pause” discussed elsewhere.

²⁵⁹ “Politburo - Iz Protokola No. 78 [From Politburo Protocol Number 78],” 13 January, 1927, 17-162-4, l. 45, RGASPI, p. 1.

²⁶⁰ V.N. Ipatieff, “Original Manuscript of ‘My Life as a Chemist,’” 1946, Ipatieff Collection, Boxes 1 and 2, Hoover Institution at Stanford University, pp. 608-639, Senior German officers, using code names, also visited the facilities. The worker interviewed by Vorwärts noted Lieth-Thomsen and Tschunke as having spent time at Ivaschenko.

²⁶¹ “Die Giftgasfabrik in Trotsk [The Chemical Weapons Factory in Trotsk],” p. 1.

facility.²⁶² The Soviets accused Stolzenberg of being a “swindler” because the “unsatisfactory results” and demanded Reichswehr intervention.²⁶³

The Germans eventually offered to cancel the *Bersol* contract with Stolzenberg once it became clear that Soviet hopes for the facility were unlikely to be fulfilled without the investment of much more time and money. The Politburo met to discuss the question on January 17, 1927, and agreed to end its arrangements at Ivashchenko.²⁶⁴ *GEFU* terminated their contract with Stolzenberg and sold the site and equipment to *Metachim* for a nominal cost.²⁶⁵

Stolzenberg, who had invested tremendous amounts of money in the *Bersol* venture, found himself suddenly ruined. He filed for arbitration in Germany, a dangerous measure given the secretive nature of his work, but the Reichswehr managed to conceal the legal process.²⁶⁶ Not surprisingly, Stolzenberg lost his case and had to go through

²⁶² “Die Giftgasfabrik in Trotsk [The Chemical Weapons Factory in Trotsk],” p. 1.

²⁶³ *Ibid.*

²⁶⁴ Gorlov, 114.

²⁶⁵ Henning Schweer, *Die Geschichte der Chemischen Fabrik Stoltzenberg bis zum Ende des Zweiten Weltkrieges* (Stuttgart, DE: Diepholz Verlag für Geschichte der Naturwissenschaften und der Technik, 2009), p. 65.

²⁶⁶ Stolzenberg was forced to declare bankruptcy. It seems that Stolzenberg’s creditors took over one of his main facilities after his losses in the USSR, but his firm remained active, leasing a new laboratory and manufacturing plant. Stolzenberg recouped some of his losses from his profitable and questionable Spanish venture, and the Reichswehr rewarded him for his loyalty with additional chemical contracts. Further proof of his business’ survival comes two years later. Stolzenberg’s name appears as the head of his company during a further legal issue in 1928. On May 20 of that year, a train shipment of phosgene in transit to Hamburg harbor for shipment to the United States blew a valve. A cloud containing thousands of liters of phosgene gas spewed out and drifted into the suburb of Wilhelmsburg. The leak killed 10 people and left more than 300 seriously ill. The Reichswehr apparently worked hard to cover the incident up, and Stolzenberg survived that scandal unscathed as well. According to business historian Henning Schweer, Stolzenberg’s company only finally dissolved after another major chemical explosion in 1979 killed a child; a police investigation revealed large quantities of illegal chemical agents being manufactured for the West German military. Some of these may have found their way into Saddam Hussein’s arsenal during the Iran-Iraq War.

bankruptcy proceedings in 1927. But with the assistance of the German military, his business survived by increasing sales to the Spanish government.

Bersol took on new life after its official termination in 1927. Much like Fili, the plant would eventually become productive under the Soviet aegis. By 1936, *Bersol* was producing four tons of mustard gas a day, making it the largest center of mustard gas production in the world.²⁶⁷ It also became a center of experimentation and production of “prussic blue” (hydrogen cyanide), which was marketed as “Zyklon B” in Germany.²⁶⁸ Factory hands at *Bersol* filled tens of thousands of artillery gas shells a month.²⁶⁹ In 1931, when relations between the German and Soviet militaries were at their best, the Soviets denied Reichswehr personnel access to the old facility. Clearly it was of vital significance to the Soviet CW program.²⁷⁰ It remained a central part of the Soviet chemical weapons program through the end of the Cold War. The legacy of the *Bersol* plant can be seen today: Ivashchenko, (renamed Chapaevsk in 1927), is known as the “Town of Death.” The extensive chemical works built during the period of cooperation with the Germans

²⁶⁷ Milton Leitenberg, Raymond Zilinskas; *The Soviet Biological Weapons Program, a History* (Cambridge, MA: Harvard University Press, 2014), p. 740. The top US mustard gas facility in Ohio had produced as much as 10 tons a day by 1918, but like most other chemical weapons programs around the world, production was drawn down and then suspended after the end of the war. So while *Bersol* was not the most productive mustard gas production facility of all time, it seems to have been the largest in operation in 1936.

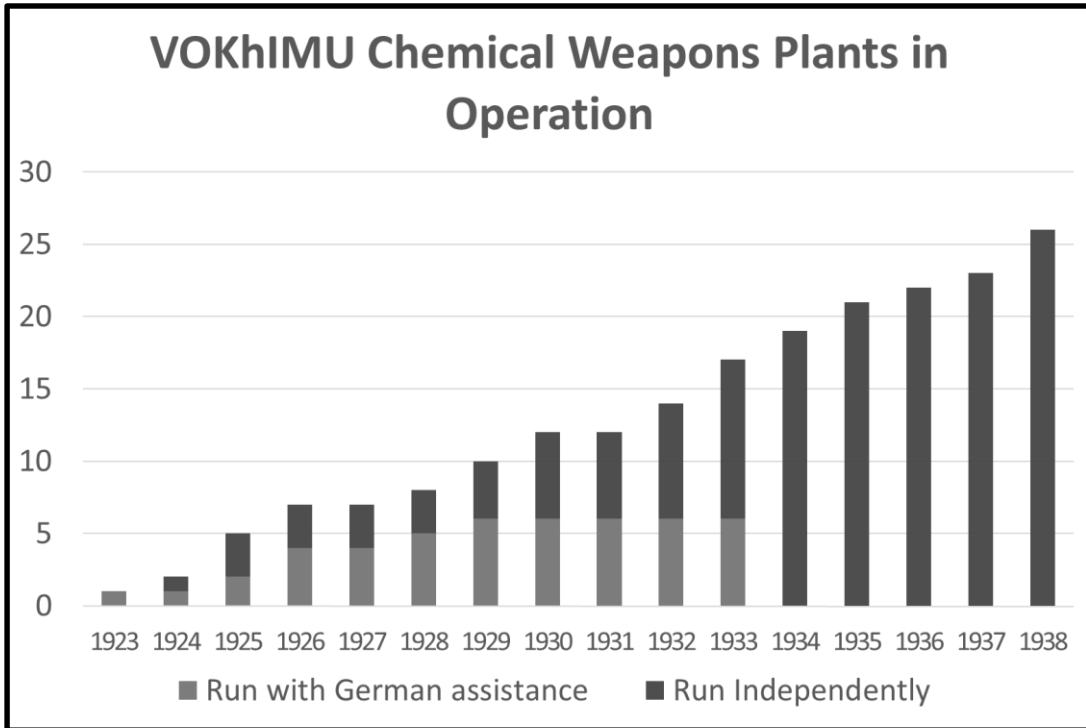
²⁶⁸ Fridman, Baleev, “Otchet O rabote ispitaniye poglotitel'noy sposobnosti protivogazovoy korobki po otnoshenii k sinil'noy kislote [Report on the testing of absorbency of anti-gas shells with regard to hydrocyanic acid],” April 18, 1933, 2305,3,9, l. 9, TsGASO, ll. 12-13.

²⁶⁹ “Direktoru Zavoda №1, OB khimsnariadov [To the director of Factory Number 15, Chemical Shells]” January 31, 1932, 2700-10-28, L. 3, TSGASO, l. 1.

²⁷⁰ “Protokoll über die Sitzung am 16.10.32 über das To.-Programm, [Minutes of the meeting on October 16, 1932 on the Tomka Program“ October 16, 1932, RH 12/4/54, 1, BA-MA, pp. 5.

(and expanded after that period ended) have poisoned the groundwater and led to one of the world's highest rates of birth defects.²⁷¹

Table 3 German Assistance in Soviet Chemical Weapons Production



On the German side, the Reichswehr reorganized *GEFU* after its failures with *Bersol*. In the fall of 1926, a new corporate entity was formed, entitled the *Gesellschaft für landwirtschaftliche Artikel* (the Society for Agricultural Products, or *GELA*). It was intended to replace *GEFU* in its work. Under the leadership of *GELA*, the Soviet and

²⁷¹ B. Revich, E. Aksel E, T. Ushakova, I. Ivanova, N. Zhuchenko, N. Klyuev, B. Brodsky, Y. Sotskov, "Dioxin exposure and public health in Chapaevsk, Russia," *Chemosphere* 2001, Issue 43, pp. 951-66.

German militaries would establish a chemical weapons laboratory and airfield nicknamed “Podosinki,” which would become the centerpiece of the Soviet-German chemical weapons program beginning in 1926.

*THE GERMAN CHEMICAL WEAPONS PROGRAM, 1923-1933*²⁷²

From 1920 until 1933, the Reichswehr’s chemical weapons program relied on four different sets of organizations: state scientific laboratories, the state chemical weapons defense program, private corporate research and private university research. The first were the vestiges of their World War I era program. Haber continued in his role as the head of the *KWI-PCE* until 1933, but his research was limited by Allied attention and a lack of funding: by 1929, he would complain to Reichswehr officials that he was no longer kept informed on chemical weapons matters.²⁷³ The second were official Reichswehr gas warfare facilities.²⁷⁴ In 1929, these focused on chemical defense. But the real work in chemical weapons technology was done outside of the Reichswehr: relying on a network of scientists developed at *KWI-PCE* during the war, the Reichswehr indirectly supervised critical research conducted at German universities and at a number of German firms.²⁷⁵ These connections became increasingly concrete after 1933, when a

²⁷² Very little is known of the interwar German chemical weapons program, in part because the German military destroyed most of the documentation before the end of World War II. As a result, this section of the dissertation draws heavily from Soviet sources, some of which have not been cited before, to the author’s knowledge.

²⁷³ While he was brought back into the “loop” after he lodged his complaint, the Truppenamt was angling to have him replaced as head of *KWI-PCE* by a younger officer who served in the clandestine CW program in the 1920s.

²⁷⁴ From November, 1923 onwards, the Ministry of Defense’s “Commission for Chemical Matters” supervised all offensive chemical warfare work. Zeidler, p. 124.

²⁷⁵ Stolzenberg, pp. 168-169.

number of former *KWI-PCE* personnel would again find employment in the German military.

There were three official Reichswehr CW facilities by 1929.²⁷⁶ The largest of these was the Chemical Weapons Defense Complex at Spandau. There the Reichswehr operated a laboratory where tests were performed on purchased gas masks and respiratory equipment. The Spandau facilities also included a storage warehouse and a repair shop. This facility employed about 100 officers and staff.²⁷⁷ The next most important facility was the Kummersdorf Testing Grounds, also near Berlin. This base contained a laboratory where decontamination techniques and anti-gas shelters were tested. In particular, efforts at Kummersdorf focused on defense against mustard gas. As the Spandau and Kummersdorf complexes supposedly focused on gas defense technology, their existence technically did not violate the Treaty of Versailles' provisions. Of course, to actually test chemical defense, it was necessary to use chemical agents, which was illegal. But the Allies did not interfere with the operation of either base after 1926. In addition, the Reichswehr operated an "Anti-Gas School." This base was designed to train

²⁷⁶ This information is drawn from a Soviet report. In February 1929, Rockinson, the assistant head of VOKhIMU, traveled to Germany, where he spent a month touring the underground German chemical weapons program. The head of VOKhIMU, chemist Yakov Fishman, wanted Rockinson to get as full a picture of German facilities as possible. He worried, naturally, that his German allies were not sharing their most up-to-date research with VOKhIMU, as promised. So Rockinson, and his traveling companions, officers Kartsev and Blinov, were instructed to visit all the German facilities to which they could gain entrance. The Germans assured them that they saw everything that existed. Given that the Nazis destroyed most of the documentary evidence of the German interwar chemical weapons program in 1944, Soviet intelligence reports like Rockinson's are among the best remaining pieces of evidence on the structure and state of the German program. (Yakov Fishman, "Predsedateliu, Revolutionnogo Voennogo Soveta [To the head of the Revolutionary Military Council]" February 1929, 33987-3-285, p. 13, RGVA (#152, Y-RAP), p. 1.

²⁷⁷ Fishman, "Predsedateliu, Revolutionnogo Voennogo Soveta [To the head of the Revolutionary Military Council]," p. 2.

officers and NCOs in basic areas of chemical defense: how to identify a gas attack, how to put on a mask, and how to manage troops under a CW attack. The course there lasted approximately two weeks, and trained up to 150 officers at a time.²⁷⁸ The Anti-Gas School's main building also contained a small museum to the German chemical weapons program.²⁷⁹

More importantly, the Reichswehr relied upon a network of university professors, most of them former students or employees of Fritz Haber. Why were German scientists so willing to challenge the Treaty of Versailles, and indeed, their own elected government in pursuing illegal weapons research and development? The attitudes of the scholarly community as a whole were more in line with the military than with the ruling Social Democrats:

The great majority of scholars viewed the Weimar government with icy reserve. They regarded parliamentary politics as sordid and factional, but they did not realize that their own stance, which was allegedly "above politics" was just as divisive as that of the parties they abhorred.²⁸⁰

The Army thus found many German scientists willing partners in secret rearmament. In 1925, the Army Ordinance Department organized a "Council of Scientific Workers" with an eye towards chemical defense.²⁸¹ This group, headed by General Max Ludwig, included senior faculty from five universities, two government bureaus and a corporate representative from Auer.²⁸² As part of this reorganization of the secret CW program, in

²⁷⁸ Stolzenberg, p. 3.

²⁷⁹ Ibid.

²⁸⁰ Alan D. Beyerchen, *Scientists under Hitler: Politics and the Physics Community in the Third Reich* (New Haven: Yale University Press, 1977), p. 4.

²⁸¹ Stolzenberg, p. 168.

²⁸² Ibid, pp. 168-169.

February 1925, Seeckt, Stresemann and Interior Minister Schiele agreed to the foundation of an *Institut für Gasanalyse* at Germany's elite technical university, the *Technische Hochschule Berlin*.²⁸³ Its first head was Haber protégé and Council of Scientific Workers' member Professor of Biology Fritz Wirth. Ostensibly, his work was to focus on civilian defense. With government funding, he maintained a laboratory where he focused on "degassing [living] tissue."²⁸⁴

Other work under the auspices of the Council of Scientific Workers near Berlin included a laboratory run by a Professor Obermüller. His work was explicitly offensive in nature, as a Soviet visitor to his lab recorded that his research focused on improving the production and quality of mustard gas, rendering it more suitable for "spraying purposes."²⁸⁵ Obermüller's primary task was to produce *Hardlost*, or mustard gas of much higher density that would maintain fatal concentration for a longer period of time. Such a product could have great value in the realm of chemical aviation: it would have enabled the strategic bombing of cities by aircraft at high altitudes.

The other primary center of university research was in Würzburg. Efforts there were led by Professor Ferdinand Flury, the Chair of the Pharmacology Department at the University of Würzburg. Flury, who had remained employed at *KWI-PCE* until 1920, had re-entered work advising the Reichswehr beginning in 1926.²⁸⁶ After Haber's death in 1934, he would be seen as perhaps the world's foremost leading chemical weapons

²⁸³ Zeidler, 124.

²⁸⁴ Yakov Fishman, "Predsedateliu, Revolutionnogo Voennogo Soveta [To the head of the Revolutionary Military Council]" February 1929, p. 2.

²⁸⁵ Ibid.

²⁸⁶ Flury had headed Department E (the Toxicology Department) at Haber's *KWI-PCE* during the war. He would be considered the world's leading expert on chemical weapons after Haber's death in 1934.

expert: the Soviets, for instance, noted in 1929 that “Flury is Germany’s leading specialist on the study of the effects of chemical agents on living organisms.”²⁸⁷ His 1931 book *Harmful Gases* and his 1938 work *Toxicology and Hygenic Technical Solvents*, were considered foundational reading on chemical warfare in the interwar period.²⁸⁸ In 1929 Reichswehr’s IWG hired Flury directly (and secretly) to work on the synthesis of new chemical agents. From 1929 to 1933, Flury’s team at Würzburg worked on testing new agents by the hundreds at their laboratory.²⁸⁹ He and a number of his students, most notably Dr. Wilhelm Neumann, would become increasingly tied to the military establishment: both Neumann and Flury would be eventually be commissioned into the Wehrmacht during the Second World War.²⁹⁰

The fourth crucial aspect of the interwar German chemical weapons program was its corporate network. While Germany’s largest industrial firms – Krupp, Daimler, M.A.N. and others – had enthusiastically embraced Seeckt’s secret rearmament program starting in 1926, the same could not be said of Germany’s chemical industry. Drawn together initially during World War I under the Hindenburg Program of August 1916, Germany’s world-leading industry had combined into the massive IG Farben Cartel in December 1925. Collectively, IG Farben operated almost 80 percent of Germany’s

²⁸⁷ Yakov Fishman, “Predsedateliu, Revolutionnogo Voennogo Soveta [To the head of the Revolutionary Military Council]” February 1929, p. 3.

²⁸⁸ Wilhelm Neumann, “Flury, Ferdinand” in: *Neue Deutsche Biographie* 5 (Munich: Bayerische Akademie der Wissenschaften, 1961), p. 264. <http://www.deutsche-biographie.de/ppn11868406X.html>

²⁸⁹ Zeidler, p. 202.

²⁹⁰ Professor Neumann of the University of Würzburg joined the SA in 1934 and the Wehrmacht in 1937. See Stefanie Kalb, *Wilhelm Neumann (1898 - 1965) - Leben und Werk unter besonderer Berücksichtigung seiner Rolle in der Kampfstoff-Forschung [Wilhelm Neumann (1898-1965) – Life and Work with A Special Emphasis on his role in Poison Gas Research]* (Unpublished Dissertation, 2005, University of Würzburg).

chemical industry, employed 120,000 people and had a capitalization of more than 1.2 billion Gold Reichsmarks in 1926.²⁹¹ It was the largest corporation in Europe in 1932, and the fourth largest in the world.²⁹² Carl Duisberg and Carl Bosch, the two men who dominated IG Farben until World War II, were not enthusiastic supporters of rearmament in the 1920s.²⁹³ Bosch in particular, who was perhaps the greatest living chemist of the age and a Nobel laureate, gradually became an ardent anti-Nazi and did not enjoy particularly warm relations with the military.²⁹⁴ Further, the French and British had occupied the German industrial heartland, where most of IG Farben's production was centered, leaving IG Farben isolated and under close IAMCC scrutiny.

As a result, the Reichswehr had to depend on smaller firms, which were willing to take far greater financial and personal risks in the name of rearmament. The best example has already been noted. The Reichswehr leaned heavily on Stolzenberg's firm to maintain the momentum of German chemical weapons research after 1920. The decentralized nature of the German program, necessitated by the IAMCC, meant that Stolzenberg had a great deal of independence. One critical example was demonstrated in 1925, when

²⁹¹ Diarmuid Jeffreys, *Hell's Cartel: IG Farben and the Making of Hitler's War Machine* (New York: Metropolitan Books, 2008), p. 124.

²⁹² *Ibid.*, p. 168.

²⁹³ Fishman kept seeking help from IG Farben and requesting to visit IG Farben facilities. He did not realize that no CW work was being conducted there and that IG Farben had no interest in working in the USSR and even less interest in developing CW weapons for the Red Army. As the Germans noted to their frustration. "Fishman is convinced that the IG Farben companies are carrying out military work in their laboratories....he would like to learn something about this....This is not the case." "Sitzung über To.-Programm am 17.10.32 [Meeting on the To.Programm on October 17, 1932]," October 17, 1932, RH12-1/54/36-38, BA-MA, pp. 1-3.

²⁹⁴ Jeffreys, pp. 176-9. This is confirmed by internal Reichswehr correspondence, which as late as 1933 concluded that "Industry in the [field of] chemical warfare must be treated with great care, as apart from the Treaty of Versailles, the German side has also supported and signed the Geneva [convention] prohibiting chemical warfare. This explains to a large extent the dislike of the German chemical industry for working in the field of chemical weaponry." "Stellungnahme zu den ru. Forderungen To. [Opinion on the Russian demands for To.]," 1933, RH12/1/54, 39-41, BA-MA, pp. 1-3.

Stolzenberg and the Junkers Corporation, brought together by the IWG to work in Russia, signed an agreement to begin secretly developing aircraft with chemical weapons deployment technology.²⁹⁵ Reichswehr officers were actually taken aback when they learned that Stolzenberg planned to develop chemical aviation technology on his own, as he did not consult them first; however, they noted that “the initiative of the two companies is very welcome.”²⁹⁶ Major Fischer of the Truppenamt also arranged to have Stolzenberg’s chemical weapon aviation technology tested under the guise of “pesticides” in a secluded corner of East Prussia (Rossitten, now Rybachy); this program ran from June until September 1925.²⁹⁷ But as a formal relationship with the Soviet Union developed, further testing inside of Germany was suspended.²⁹⁸

In addition, two Berlin-based chemical defense companies played important roles in the German interwar efforts. These were Auer, based in Oranienburg near Berlin, and the Draeger Plants in Lübeck and Kiel. Incidentally, Auer had been co-founded by Leopold Koppel, a Jewish- German entrepreneur who had endowed Haber’s Kaiser Wilhelm Institute in 1911.²⁹⁹ Part of Degea, the *Deutsche Gasglühlicht AG* (The German Gas Light Company), the Oranienburg plant was brand-new (having opened in 1926) and on the cutting edge of gas mask and gas defense technology, including against aerial gas attacks. As a Soviet delegation noted in 1929, they could immediately tell the importance of the Auer plant based on the fact that their “introduction [to the Auer Plant] was made

²⁹⁵ “Fl. Nachricht Nr. 3 [Flight Report Number. 3,]” 24 July, 1924, RH/2/2216/319-327, BA-MA, p. 4.

²⁹⁶ Ibid.

²⁹⁷ Zeidler, p. 126.

²⁹⁸ Ibid.

²⁹⁹ Stolzenberg, pp. 110-111.

very reluctantly.”³⁰⁰ Besides its chemical weapons work, Auer was also the leading private firm working in the field of uranium enrichment and the commercial applications of nuclear physics. Their Oranienburg Plant would become the home of Uranium Oxide production for Nazi nuclear weapons project, beginning in 1939.³⁰¹ Rockinson, VOKhIMU chief of staff, was very impressed by a visit he made to the Auer facility: the Red Army would seek to buy huge numbers of gas masks from Auer in the early 1930s.³⁰²

The other facility, the Draeger plants in northern Germany, were also producing gas masks on a large scale. They specialized in insulating and filter masks, as well as decontamination equipment for soil. A Russian military visitor also noted with interest that Draeger AG, while purporting to be entirely independent from the Reichswehr, in fact followed orders in design and production from the *Waffenamt Prüfwesen*'s Design Bureau of Chemical Management.³⁰³ As might be expected, a number of former staff from the *KWI-PCE* had found employment at Draeger and Auer. These corporations (and there were other, smaller businesses involved as well) played a critical role in maintaining professional expertise and production capacity – both defensive and offensive – for the German military.

Altogether, these eight facilities constituted the bulk of the Reichswehr's chemical weapons program in 1929. Because the Reichswehr depended upon its network

³⁰⁰ “Fl. Nachricht Nr. 3 [Flight Report Nr. 3],” 24 July 1924, pp. 1-5.

³⁰¹ Ibid.

³⁰² “Spravka o Inostrannoi Tekhnicheskoi Pomoshchi po-Voenno-Khimicheskomu Delu, [Report on Foreign Technical Assistance for Military-Chemical Matters],” 20.2.1931, 33988-3-162, l. 200-199, RGVA, pp. 1-2.

³⁰³ Ibid, pp. 2-3.

of university and corporate laboratories for the development of offensive chemical weapons, it lacked direct control over the testing of new chemical agents and dispersal methods within Germany. It was to remedy that deficit that the Reichswehr would begin work with the Soviet Union, sending many of its top CW experts eastward to secret facilities deep inside Russia.

THE SOVIET CHEMICAL WEAPONS PROGRAM, 1919-1933

The Soviet CW program operated under difficulties even greater than the German program. Lacking a substantial chemical industry and with most of the top scientists and chemists departing the country during the great bourgeois exodus between 1917 and 1921, the Red Army had to start nearly from scratch in developing its chemical weapons program. And even before the Revolution, Russia lagged far behind its German adversaries and Entente allies in developing toxic agents for the battlefield.

The Germans first used lachrymatory agents on the Eastern Front on January 31, 1915. But it was the use of deadly chlorine gas in late May of that year that finally elicited a major response from the Russian Army.³⁰⁴ That summer, the Tsarist Army organized a chemical weapons program within the Ministry of Defense's Artillery

³⁰⁴ The Russian Army was not caught wholly unawares. In January 1915, "professor-chemist and General A. A. Zabudskiy, the commander of the newly created Central Scientific-Technical Laboratory of the army, called a meeting to discuss the technical component of the war. Besides other topics, the meeting briefly considered the use of "suffocating and intoxicating gases in shells," which the majority of officers opposed, arguing that "such methods can be regarded as inhuman and have not been previously used by the Russian army." Still, Zabudskiy did not completely rule out possible future uses of poison gases, "in case of the enemy's gross abuse of such methods." He ordered the laboratory's department of powder and explosives to conduct research on appropriate substances in order to be ready "in case of an emergency, to start production." (Alexei Kojevnikov, "The Great War, the Russian Civil War, and the Invention of Big Science," *Science in Context* 15(2), 239–275 (2002), p. 245.

Department.³⁰⁵ This agency was headed by lieutenant general and famed chemist Vladimir N. Ipatieff, and overseen by General I.A. Krylov.³⁰⁶ Ipatieff established a laboratory in St. Petersburg, and brought together a team comprised of academic chemists and biologists, who began the first systematic chemical weapons research in Russia.³⁰⁷ Their efforts led to the production of chlorine, phosgene and chloropicrin (a lachrymatory agent) in 1916.³⁰⁸ The Tsarist Army first deployed chemical weapons against German and Austrian troops in small quantities on May 24, 1916; they fired their first chemical artillery barrage against German positions on September 5 of that year.³⁰⁹ Generally, however, the Tsarist army lagged far behind Germany in the quantity and quality of its offensive and defensive capabilities. Phosgene production, superintended by Professor E.I. Spitalsky, proved the most successful of the three chemical agents. But by 1918, Russia had produced only approximately 3,650 tons of poisonous agents, compared to 107,825 tons produced by Germany.³¹⁰ In the realm of gas masks, too, the Russians lagged far behind in both the quality and quantity of equipment available at the front. As a result of the massive disparities in offensive and defensive capabilities, Russian soldiers were about three times more likely to die from CW as their western counterparts.³¹¹

³⁰⁵ Lev Aleksandrovich Fedorov, *Khimicheskoe Oruzhie v Rossii: Istoria, Ekologia, Politika*, [*Chemical Weapons in Russia: History, Ecology, Politics*] (Moscow: Center for Ecological Policy of Russia, 1994). Online link at http://fas.org/nuke/guide/russia/cbw/jptac008_194001.htm

³⁰⁶ Martinetz, pp. 62-63.

³⁰⁷ Among those with international reputations were Professor Eugen I. Spitalsky, Vitaly Chlopin, Nikolai Zelinsky and Vladimir Arkadiev. In some respects, it is remarkable how much the team achieved, given the limits of Soviet industry and their late beginning, some 12 months behind the Germans.

³⁰⁸ Martinetz, p. 122.

³⁰⁹ Ibid, p. 62-3.

³¹⁰ Ibid, p. 122.

³¹¹ Vászárhelyi, Földi, pp. 135-146.

When the Bolsheviks seized Petrograd, they also took control of Russia's small chemical weapons stockpile. During the Russian Civil War, the high mobility of the battlefield rendered chemical weapons of limited utility. Despite this drawback, the Russian Civil War would see a number of pioneering uses of CW. On three recorded instances, chemical bombs were dropped by airplanes, the first use of chemical warfare in aviation history. The actual first practitioner of the chemical aero-bomb is somewhat in doubt: The Soviets credited themselves with the first use of an aerial gas attack with a bombing run during the battle of Balashova on June 30, 1919.³¹² However, the British claimed to have used chemical bombs against Soviet troops during their intervention a few months earlier.³¹³

Despite the limited use of chemical weapons in battle during the Russian Civil War, the Red Army did use chemical weapons systematically against civilian targets. Three times during the Civil War, the Red Army unleashed portions of the Tsarist chemical weapons stockpile against civilian populations, usually in the context of suppressing armed revolts behind Bolshevik lines. The first recorded incident was in the city of Yaroslavl in 1918. The following year, chemical weapons were used against Cossack villages. The final incident, by far the largest, took place in Tambov Province in 1921, well after the Civil War had been decided.

³¹² Fishman, "Betrieb: Erscheinungsformen der chemischen Luftwaffe [Subject: Forms of the Chemical Air Force]," 1925, RH/12/4/47, 26, BA-MA, p. 2.

³¹³ G.B. Carter, *Chemical and Biological Defence at Porton Down, 1916-1920*, p. 38. The third incident occurred when White Russian forces deployed chemical bombs during the battle of Chernigov in 1920. Betrieb: Erscheinungsformen der chemischen Luftwaffe [Subject: Forms of the Chemical Air Force]," p. 2.

On January 11, 1919, Lenin and the Bolsheviks introduced *Prodravyorstka*, or “Surplus Appropriation System.” This “legalized” the confiscation of enormous quantities of grain. Tambov Province, a major grain growing region along the Volga River and a battleground between the Red and White Army, found itself subject to huge requisitions by both sides. Red Army brutality in the region triggered peasant partisan activity which swelled by 1920 to a major revolt. Led by a capable young soldier named Aleksander Antonov, the revolt spread to cover much of the Volga Region.

By October 1920, the Bolsheviks had concluded the Polish-Bolshevik War and began massive troop transfers to the region. But by that juncture, the peasant rebellion had swelled to at least fifty thousand guerillas in arms.³¹⁴ After suffering several bloody defeats, the Red Army sent General Tukhachevsky to the region. He soon came to the conclusion that the swampy and forested terrain which shielded the guerillas was the main obstacle to victory. In early June, the Red Army began transferring gas shells to Tambov Province. On June 12, 1921, Tukhachevsky issued an order that “the forests where the bandits lurk should be cleaned out with poisonous gases.”³¹⁵ On June 24, the inspector of artillery under Tukhachevsky reported the availability of 2000 gas shells containing asphyxiates at the ammunition depot.³¹⁶ A technical expert named Tsuskov

³¹⁴ Stephane Courtois, Nicolas Werth, Jean-Louis Panne, Andrzej Paczkowski, Karel Bartosek, Jean-Louis Margolin, *The Black Book of Communism: Crimes, Terror, Repression*, trans. By Jonathan Murphy and Mark Kramer (Cambridge, MA: Harvard University Press, 1999), pp. 109-133.

³¹⁵ Kakurin, “Prikaz: Kommandyushchego Voiskami Tambovskoi Gubernii N. 0116/Operativno-Sekretni [Order: Commander of the Tambov province N 0116 / Operational Secret],” June 21, 1921, reprinted in B. Sennikov, *Tambovskoe Vosstanie 1918-1921 g.g. I raskrestyanivanie Rossii 1929-1933 g.g.* [*The Tambov Rebellion of 1918-1921 and the Russian Peasantry, 1929-1933*], (Moscow: Posev Publishing, 2004). Originally F.34228. Op.1. D.292. L.5, RGVA, p. 1.

³¹⁶ S. Kosinev “Raport, Inspektor Artillerii Tambovskoi Armii [Report from the Inspector of Army Artillery, Tambov Province],” 1 July, 1921, reprinted in B. Sennikov, *Tambovskoe Vosstanie [Tambov Rebellion]*.

was sent to inspect them, and concluded that the canisters were in good shape and ready for deployment.³¹⁷ Beginning in July and peaking in August, Red Army formations used gas extensively, depopulating villages in resisting areas to deprive guerilla fighters of supplies and bases of operations. In some cases, artillery units fired more gas than high explosive shells during their destruction of rural villages.³¹⁸ The use of gas proved effective, as resistance quickly began to decline in August and September 1921.³¹⁹ The Tambov Operation appears to have convinced some, including Tukhachevsky, that CW was an essential part of the Red Army's future arsenal.³²⁰

The Soviet chemical weapons program, from 1918 to 1924, was managed by the Artillery Directorate, which in turn reported to the Revolutionary Military Council. Its facilities included chemical weapons storage grounds, a chemical-artillery firing range at Kuzminki near Moscow (starting in 1918), a central laboratory in St. Petersburg, and a

³¹⁷ Gas Technician Tsuskov, "Raport [Report]," 1 July, 1921, reprinted in B. Sennikov, *Tambovskoe Vosstanie [Tambov Rebellion]*.

³¹⁸ B. Sennikov, *Tambovskoe Vosstanie*, [Tambov rebellion of 1918-1921].

³¹⁹ Adding to the brutal treatment of Tambov Province, Tukhachevsky also sanctioned the issuing of Order 177:

"1. Anyone who refuses to give his name, shoot on the spot. 2. Families which may be concealing weapons – authorities are authorized to seize hostage and shoot on the spot. 3. In the case of finding the weapons: shoot all present. 4. A family that harbors a bandit in their house must all without exception be arrested and their property confiscated. The senior worker in a family is to be shot on the spot, and the family sent [to the camps].

5. Every family which hides family members or property of the "bandits," is to be regarded as "gangsters." The senior worker in such families are to be shot on the spot.... "These draconian measures, coupled with a growing, Bolshevik-created famine in the region destroyed resistance to Bolshevik rule. As the conflict died down, the Red Army opened seven concentration camps where survivors from rebellious villages were systematically starved to death. All told, more than 240,000 men, women and children were killed or executed by the Red Army during the Tambov Operation. ("Prikaz – Polnomochnoi Komissii VTsIK 171 [Order 171 of the Central Executive Committee Plenipotentiary Commission]," June 23, 1921, reprinted in B. Sennikov, *Tambovskoe Vosstanie*, [Tambov rebellion] (Moscow: Posev Publishing, 2004).

³²⁰ This attitude was also common among party members at large. A few years later, a scientist at the Sixteenth Party Congress would proclaim that the next war would be decided "not by metal, but by chemicals, not by bayonets and shells, but by poison gases." Fedorov, Introduction.

CW officer training school.³²¹ The intention of this last facility was to train “chemical officers,” who would be responsible for teaching basic methods of defense and managing defensive materiel for each regiment in the event of a gas attack.³²²

With the systematic reorganization of the Red Army in 1924, new chemical weapons organizations appeared. In that year, Trotsky’s personal interest in CW led to the foundation of the rather incredibly named “Society for Friends of Chemical Warfare.” This organization was intended to bring together top military and civilian experts to discuss theory and the practice of chemical warfare.³²³ In 1924, the Revolutionary Military Council (RVS) reorganized all of its CW facilities, placing them under a single agency called the Chemical Defense Directorate.³²⁴ The first head of this organization was the assistant Soviet military attaché to Germany, Yakov Fishman.

Yakov Fishman was the most important figure in the interwar Soviet chemical weapons program.³²⁵ Born to a Jewish family in Odessa in 1887, Fishman was a precocious student. He moved to Italy, where he received a PhD in chemistry by the age of 25. He affiliated himself with the Bolshevik cause before the Revolution, and returned to Russia to serve in the Red Army in 1917. His expertise in chemical warfare and the chemical industry led to his rapid promotion. After the Russian Civil War, Fishman

³²¹ Marina Katys, “Voenno-Khimicheskie Poligon v Moskve [The Military Chemical Testing Grounds - in Moscow],” Radio Liberty, 20.12.2000, Freedom Archives, <http://www.svoboda.org/content/transcript/24197763.html>

³²² It would be reestablished in 1932 as the *Timoshenko Military Academy of Chemical Defense*. “Betrieb: Gaskrieg. Sowjetrussland [Gas Warfare, Soviet Union],” November 14, 1924, RH/12/4/46, BA-MA, p. 2.

³²³ In 1927, it would be incorporated into the powerful OSOAVIAKhIM (Union of Organizations Assisting in the Defense and Aviation-Chemical Construction of the USSR) Civil Defense organization. “Betrieb: Gaskrieg. Sowjetrussland [Gas Warfare, Soviet Union],” November 14, 1924, RH/12/4/46, BA-MA, p. 1.

³²⁴ Gorlov, pp. 134-135.

³²⁵ Benjamin C. Garrett, John Hart, “Fishman, Yakov Moiseevich (1887-1962) in *Historical Dictionary of Nuclear, Biological and Chemical Warfare* (Lanham, MD: Scarecrow Press, 2007), pp. 76-77.

served as an assistant military attaché in Germany, a position in which he became well acquainted with Germany's world leading chemical industry.³²⁶ Fishman also had good political connections: his patron was Josef Unschlikht, the deputy head of the CHEKA (1921-1923) and then the deputy Commissar of the Ministry of Defense. Unschlikht was a close associate of Josef Stalin, who used Unschlikht to keep an eye on the Red Army. As a result, Fishman's star rose rapidly as Trotsky's influence within the Red Army declined.

On August 15, 1925, the RVS, then headed by Mikhail Frunze, again reorganized its CW program into *VOKhIMU* (the Military-Chemical Defense Committee).³²⁷

Fishman, who had served for a year as head of the Red Army's Chemical Defense Directorate, was promoted to head this larger and more independent organization. He remained in that position until 1937, also adding the chairmanship of the Red Army's Military-Industrial Directorate to his portfolio in 1928. As one of the staunchest advocates of cooperation with the Germans, he traveled to and from Germany extensively during the interwar period and developed relationships with a number of senior German officers. He also corresponded and consulted with Dr. Fritz Haber, who provided advice to the early Soviet chemical weapons program.³²⁸ As a result, more than any other part of the Soviet military, the early Soviet chemical weapons program mirrored German developments.

Fishman had been given an incredibly difficult task. Like much of the Soviet military, he inherited a pale shadow of the Tsarist Army's capabilities. When he took the

³²⁶ Garret, Hart, p. 77.

³²⁷ This agency would become responsible for the bulk of the Soviet CW program, its biological weapons program and play a role in its nuclear program. Gorlov, pp. 134-135.

³²⁸ Garret, Hart, p. 77.

job in September 1925, Fishman wrote that he was handicapped by “the overall low level of the state-run chemical industry of the USSR, a lack of chemical engineering specialists and researchers, a chemical laboratory system in a desperate state [and] the lack whatsoever of engineering organizations specializing in chemical weaponry.”³²⁹ In essence, Fishman had inherited a single, semi-functioning laboratory in St. Petersburg staffed by former Tsarist chemists, a dilapidated testing ground near Moscow and a stockpile of aging and unreliable Tsarist chemical weapons.

That inheritance was problematic. In the aftermath of the Civil War, the chemical weapons stockpile left over from the Tsarist Army was placed under the supervision of the Red Army’s Artillery Directorate. Despite some usage in the Russian Civil War, this stockpile remained large and poorly managed. In 1930, Fishman noted that there were 976,589 chemical weapons shells in VOKhIMU’s mobile reserves. Most of these had been manufactured in 1916 or 1917. Almost 470,000 of them were “worthless” and needed to be promptly decommissioned.³³⁰ Fishman noted that many of the rest were composed of “non-persistent agents” which meant that the shells had to be either refilled or discarded.³³¹ Assistant Chief of the Red Army Staff Pugachev described the main storage facility as a “chemical trash heap.”³³² In essence, the chemical weapons stockpile served as little more than a burden in terms of personnel and expenditures for *VOKhIMU*.

³²⁹ Yakov Fishman, “V Osnovnom Soglasen, Uborevitchu [A Summary of the Agreement, to Uborevich] “ 30 December, 1930, 33988/3/162, 165-141, l. 45, RGVA, pp. 1-25, p.2.

³³⁰ Ibid, p. 9.

³³¹ Ibid.

³³² Ibid, p. 2.

The country's primary chemical weapons lab was in little better shape. After the October Revolution, this facility, the Central Laboratory of the Ministry of War, was renamed the Central Chemical Laboratory and continued operations under its leader since 1916, V.N. Ipatieff.³³³ However, resources were so scarce that laboratory employees were paid only in food, and apparently not very much of that.³³⁴ The lack of resources in 1920 was so bad that this de facto head of Soviet chemical weapons program was unable to work: "about all he did was attend meetings of the Academy of Sciences...twice each month and give a weekly two-hour lecture at the Artillery Academy to about seven students, who had to wear overcoats in an unheated classroom."³³⁵

The laboratory, and Ipatieff, were liabilities for VOKhIMU. In the late 1920s, the NKVD began to aggressively investigate many of the chemists working for VOKhIMU. This was part of a broader move against "specialists" in positions of power throughout the Soviet industry and the state. The talented chemist Evgeny Spitalsky, who had pioneered the Tsarist Army's phosgene program, was arrested and sentenced to hard labor in 1929.³³⁶ Dzerzhkonich, one of Ipatieff's close associates, disappeared the same year. Ipatieff, whose family had been members of the nobility, sensed his own arrest coming. When the opportunity came to attend the International Power Congress in Berlin in June 1930, he seized it. He convinced Soviet authorities to allow him to bring his wife

³³³ Fishman, "V Osnovnom Soglasen, Uborevitchu [A Summary of the Agreement, to Uborevich]," p. 2.

³³⁴ Lewis Schmerling, *Vladimir Nikolaevich Ipatieff, 1867-1952, a Biographical Memoir* (Washington, DC: The National Academy of Sciences, 1975), p. 93.

³³⁵ *Ibid.*, p. 92.

³³⁶ Fishman, "V Osnovnom Soglasen, Uborevitchu [A Summary of the Agreement, to Uborevich], p. 3. Spitalsky died of a heart attack in 1931 while serving his sentence; his wife was sent into internal exile. Vadim J. Birstein, *The Perversion of Knowledge: The True Story of Soviet Science* (Cambridge, MA: Perseus Book Group, 2001), p. 121.

with him for “medical treatment.”³³⁷ After arriving in Berlin he informed his wife, to her shock, that they were now defectors and would not be returning to Russia. In September, 1930, Ipatieff, who did not speak English, managed to obtain a residency visa to the United States, where he was quickly offered a job at Northwestern University.³³⁸

These arrests and defections left VOKhIMU a suspect branch of the Red Army long before the military purges of 1937-1938. More heavily dependent on bourgeois “specialists” than any other branch of the Red Army, the removal of these experts handicapped VOKhIMU’s work. In 1930, Fishman complained to the Red Army Chief of Armaments Ieronim Uborevich that having already arrested the “sabotage leaders,” military intelligence blamed VOKhIMU’s failures on continued “wrecking.” He said that he was being forced to employ people “unfamiliar with scientific methods” as a result.³³⁹

In addition, Fishman faced a third major challenge. He believed that there was a “skeptical attitude towards the military chemical business from a number of military specialists.”³⁴⁰ Fishman argued for an independent chemical warfare directorate, aimed at the production of offensive chemical weaponry. He supported this with an outpouring of theoretical literature on CW theory, mostly published in the Red Army military journal *Voina I Tekhnika* [War and Technology].³⁴¹ However, the RVS disagreed with this

³³⁷ Schmerling, p. 96.

³³⁸ Ipatieff enjoyed a very successful career at Northwestern, teaching himself English and then entering one of the most scientifically fruitful periods of his career – he was 64 years old at the time of his emigration.

³³⁹ Fishman, “V Osnovnom Soglasen, Uborevichu [A Summary of the Agreement, to Uborevich],” p. 5.

³⁴⁰ Ibid, p. 2

³⁴¹ One of the earliest statements of his belief in CW was recorded there, and deemed worthy of being sent back to Germany by Section Z: ““Explosives,” wrote Fishman in 1924 “will in future wars have only secondary importance; they serve only to shatter the shell of the gas bomb and atomize the chemicals, and further to eliminate mechanical obstacles to make way for the gases.” Zeidler, p. 124.

assessment, instead assigning VOKhIMU to focus on defensive weaponry appropriate for an organization “formed under the Geneva Protocols [on chemical weapons].”³⁴²

Fishman himself never accepted the diminished role for his organization and continued to push the Red Army into exploring the offensive capabilities of chemical warfare, particularly the possibility of mass aerial bombardment.

In addition to these issues, the Soviet chemical industry upon which VOKhIMU depended was one of the weakest sectors of Soviet heavy industry. A report to the RVS in 1927 noted that it was the “the least developed industry,” and one of the most critical “bottlenecks in our industry.”³⁴³ Most of what capacity existed lay in the fields of paint, varnish and consumer production, none of which would convert easily to military capacity. The report concluded that only by encouraging massive direct investment and offering concessions to foreign companies could chemical industry – and specifically, military chemical industry – meet the needs of the Red Army.³⁴⁴ Even as late as 1931, VOKhIMU was forced to spend 268.484 rubles – a significant portion of its total budget – on imports, mostly from Germany.³⁴⁵

In part because of the chemical industry’s vital military value in a broad array of applications, it received vast amounts of capital. Under the First Five Year Plan, the

³⁴² Fishman, “V Osnovnom Soglasen, Uborevitchu [A Summary of the Agreement, to Uborevich],” p. 2.

³⁴³ “Pivlechenie Inostrannogo Kapitala v Khimicheskie Promishchlenost’ [Attracting Foreign Capital in the Chemical Industry],” January 6, 1927, 4-2-288, page 401, RGVA, p. 1.

³⁴⁴ Ibid.

³⁴⁵ While it is difficult to find a figure for VOKhIMU’s 1931 budget, VOKhIMU’s sum total spent on research, development and maintenance costs (the bulk of its expenditures) from 1926-1928 was 697,179 rubles per annum. (Yakov Fishman, “Kratkii Doklad o Rabote Khimicheskogo Komiteta VOKhIMU za 1926-1927 God I o Plane Rabote na 1927-1928 gg [Short Report on the Work of the Chemical Committee VOKhIMU for 1926-1927 and the Plan of Work for the 1927-1928 year],” May 1928, 33988, 3c, 98 (21), p. 201; p. 3)

Soviet chemical industry received 614 million rubles of direct investment. From 1933 to 1936, it received 3 billion.³⁴⁶ The results were considerable: in 1914, Russia's chemical industry had been tiny, and throughout the First World War had been dependent on its Western Allies for vital chemical products. But by 1936, the Soviet Union possessed the world's third largest chemical industry, controlling nearly 18.5 percent of global production.³⁴⁷

Beginning in 1926, Fishman and the RVS divided VOKhIMU into four sections.³⁴⁸ Each had its own laboratory and staff, and was expected to pursue different types of research. However, due to funding shortages and the general skepticism towards offensive chemical weapons, only two of these laboratories were fully staffed and functioning by 1927.³⁴⁹ Section 1 was assigned responsibility for defensive technologies: “the center of gravity of work for Section One is to find the most perfect combat gas mask available for mass production, and sufficiently cheap...”³⁵⁰ This was seen by the RVS as VOKhIMU's most important project; it received funding priority. The goal was to make available at least 3,000,000 gas masks for the war-time Red Army.³⁵¹ Production of masks was centered on the Leningrad Factory Number 1. One of the country's premiere industrial facilities, this showcased the importance of chemical defense as held by the RVS. But the initial results of mass production were woeful. The first runs of gas

³⁴⁶ Joachim Krause and Charles K. Mallory, *Chemical Weapons in Soviet Military Doctrine: Military and Historical Experience, 1915-1991* (Boulder, CO: Westview Press, 1992), p. 37.

³⁴⁷ Krause and Mallory, p. 37.

³⁴⁸ *Ibid.*, p. 2.

³⁴⁹ *Ibid.*

³⁵⁰ *Ibid.*, p. 1.

³⁵¹ Fishman, “V Osnovnom Soglasen, Uborevitchu [A Summary of the Agreement, to Uborevich],” December 30, 1930, p. 24.

masks, made in 1926-1927, had a more than 21 percent failure rate in testing.³⁵² The second run in 1928 was halted after a gap was discovered in the masks which rendered all produced units useless.³⁵³ Further, the stockpile of late Tsarist era gasmasks – type 407 – were found to be defective in design during maneuvers in 1928.³⁵⁴ In 1931, Fishman wrote that there were only 270,000 gas masks with combat units in the entire Red Army.³⁵⁵ Technical problems, the lack of trained experts, and insufficient testing hamstrung production efforts.

VOKhIMU's Fourth Section was designated to design and produce offensive chemical weapons. From 1926 to 1931, the Fourth Section devoted almost all of its resources to inventing new chemical weapons delivery systems, rather than trying to invent new chemical agents. These delivery systems were grouped into four categories. First was chemical artillery ordinance of the type used during World War I. These were being manufactured in ten variants by 1931, from 77 mm to 155 mm.³⁵⁶ Second were aerial chemical bombs, a new avenue of research. Third were chemical sprayers, developed from agricultural crop dusting technologies. Finally, VOKhIMU also experimented with chemical mortar shells. The lack of expertise and industrial capacity meant that VOKhIMU would pursue these last three technologies in conjunction with the German military until 1933.

³⁵² Fishman, "V Osnovnom Soglasen, Uborevitchu [A Summary of the Agreement, to Uborevich]," pp. 24-5.

³⁵³ Ibid, p. 24

³⁵⁴ Ibid.

³⁵⁵ "Spravka po voprosu obespecheniya protivogazami vnov' formiruemikh (po Var. No. 10) 20 Strelkovikh Divizii [Information on maintenance for the newly produced gas masks (Variant № 10) for 20 infantry divisions]," 21.11.1931, 33988-3-162, l. 115, RGVA, p. 1

³⁵⁶ Fishman, "V Osnovnom Soglasen, Uborevitchu [A Summary of the Agreement, to Uborevich]," p. 24.

In 1925, German intelligence listed eleven primary factories that VOKhIMU had taken over to manufacture chemical weapons; these included the two largest chemical plants in the Soviet Union.³⁵⁷ But while some production for VOKhIMU was done at these facilities, the organization's reach was shorter than the Germans perceived. Fishman had limited access to resources and took second shrift to other military and industrial goals, a fact supported by his organization's dismal production figures. To remedy this, Fishman sought foreign expertise to meet the broad goals set for him by RVS. Cooperation with the world's most experienced CW power – Germany – was the natural means to that end.³⁵⁸

THE ORIGINS OF DIRECT COOPERATION

Chemical weaponry proved a particularly attractive avenue of technical exchange for the German and Soviet militaries in the interwar period. The Reichswehr feared losing the advantage in chemical weapons it had once possessed. Bound by Versailles, and from 1925, by the Geneva Protocol signed by Gustav Stresemann, which prohibited the use of chemical or biological weapons, chemical warfare research within Germany was limited in the 1920s. For the Soviets, the weakness of their chemical industry and the aspirations of chemical warfare advocates like Fishman meant that chemical weapons would be a priority avenue of research.

³⁵⁷ “Die chemische Kriegsindustrie in der S.S.S.R. [The Chemical Military Industry in the Soviet Union],” November 9, 1925, RH/12/4/46, BA-MA, p. 1.

³⁵⁸ Fishman was extremely pushy in his efforts to work with the Germans. After demanding a meeting with General Hasse to discuss the beginning of chemical weapons testing together, his German counterpart wrote a complaint to his superiors about the “very aggressive behavior of Mr. Fischmann.” Zeidler, p. 126.

Beginning in the summer of 1924, Major Wilberg and Colonel Fischer had discussed the possibility of working directly alongside the Soviets on chemical weapons development. A report to Berlin dated July 24, 1924 noted the desire by the German side to develop an effective chemical aerobomb as well as aviation sprayers for chemical weapon dispersal.³⁵⁹ Formal, direct cooperation began to take form in 1924. On July 8, 1924, Fishman met with the Reichswehr's Colonel Fischer in Moscow to establish a more concrete plan of cooperation in the field of gas warfare. Fishman, particularly eager to attract German technical expertise, provided intelligence report estimates regarding the chemical weapons programs of America, England and France.³⁶⁰ He also informed Z that he had been in personal contact with Fritz Haber, whose advice he had been soliciting.³⁶¹

In exchange, the Reichswehr assisted Fishman in finding suitable German personnel to staff his training school and other technical positions.³⁶² This role in hiring Germans to staff Red Army positions began in 1924, but reached its peak in the early 1930s. The Reichswehr saw it as entirely beneficial to their interests. There had been a diaspora of German chemical weapons scientists out of Germany after the war. Placing them with the Red Army kept them, indirectly, under the eye of the Reichswehr. In addition, it put the Red Army in a position of considerable dependence on the Germans and kept the German intelligence informed about Soviet activities.

³⁵⁹ As noted earlier, even before the two militaries laid out their technical aims, Hugo Stolzenberg's firm had reached an agreement to begin testing aero-chemical devices with Junkers in Russia. "Fl. Nachricht Nr. 3 [Fl. Report Nr. 3]," 24 July, 1924, pp. 1-5.

³⁶⁰ "F.L. Nachrichten #2 [Fl. Report #2]," 11.7.1924, RH2/2216/329-330, BA-MA, pp. 1-2.

³⁶¹ Ibid.

³⁶² "Prepodavatel' Boevikh Gazov – Khimik [Teacher of Military Gas – Chemist]," 9 January 1931, 33988/3/192-191, L. 113, RGVA, pp. 1-2.

Illustrative of this connection is the example of Walther Metzner. He had been a member of Haber's team at KWI-PCE, working for *Abteilung B* for the "Creation of Gas Weaponry."³⁶³ General Ludwig wrote a letter to Fishman praising Metzner's record, describing him as Haber's "first assistant" and "his right hand."³⁶⁴ Ludwig added that Metzner was "undoubtedly the first authority in the field of martial gases in the postwar period."³⁶⁵ Unable to employ Metzner himself, he encouraged Fishman to hire him. Ludwig added that Metzner's wife had written him to ask him for assistance in looking for employment in South America, as East Asia, where Metzner had been working, did not agree with the family. Metzner had been involved in chemical weapons development in both Japan and China, but the growing crisis of the Chinese Civil War had led to his rather abrupt resignation on May 15, 1931. Ludwig redirected Metzner's interest towards the Soviet Union. He even went so far as to assist Fishman in haggling on Metzner's potential salary:

His wife told me that he wants conditions approximately as follow: a salary of \$12,000 USD, of which 50-60 percent will be cash; an apartment with four bedrooms. Exemption from all taxes. A contract of 4-5 years. These demands seem a little high, but we must not forget that Dr. Metzner received in Japan a salary of 60,000 marks a year. But in my opinion, with an increased salary contract, he would reduce the housing requirement. I propose to offer him first a salary of \$10,000 to satisfy the high salary request.³⁶⁶

Besides these personnel exchanges, a number of Reichswehr staff began to participate in Soviet chemical weapons tests. These were limited in nature, particularly before the

³⁶³ Martinetz, p. 30-32, 34, 46.

³⁶⁴ "Prepodavatel' Boevikh Gazov – Khimik [Teacher of Military Gas – Chemist]," 9.1.1931, 33988/3/192-191, L. 113, RGVA, pp. 1-2.

³⁶⁵ Ibid, pp. 1-2.

³⁶⁶ Ibid.

creation of *VOKhIMU* in 1925. In July 1924, Moscow Center noted that they were discussing the organization of joint “gas experiments,” with a particular focus on gas bombs for aircraft.³⁶⁷ However, the lack of facilities, qualified personnel and animals for testing undermined these early efforts.

CW AND BW THEORY AND TECHNOLOGY IN THE INTERWAR PERIOD

From Berlin the memo came:

Between 4 o'clock and 5 o'clock this morning, French Aerial forces.... have thrown hundreds of tons of explosive, incendiary, and poison bombs on the cities of Köln, Bonn, Koblenz, Bingen, Mainz, Worms, Mannheim, and Speyer. Damage to persons and buildings are incalculable; thousands of citizens, aged people, women, and children have been killed or lie dying. The German government has ordered its Independent Air Force to act in reprisal.³⁶⁸

This passage appeared in a science fiction novel written by Giulio Douhet, foremost air power strategist of the interwar period. Douhet speculated that future warfare would be determined entirely in the air through the strategic bombing of civilians. In his 1925 work, “The Command of the Air,” he wrote that “air power makes it possible not only to make high-explosive bombing raids over any sector of the enemy’s territory, but also to ravage his whole country by chemical and bacteriological warfare.”³⁶⁹ In Douhet’s fictional account of a future war between France and Germany, intense and brutal air warfare provided a decisive conclusion to the conflict in only 48 hours. He argued that

³⁶⁷ “Fl. Nachricht Nr. 3 [Fl. Report Nr. 3],” 24 July, 1924, pp. 1-5.

³⁶⁸ Giulio Douhet, “The War of 19—,” pp. 292-405, in *The Command of The Air*, translated by Dino Ferrari (Washington DC: Air Force History and Museums Program, 1998), p. 372.

³⁶⁹ Giulio Douhet, *The Command of The Air*, translated by Dino Ferrari (Washington DC: Air Force History and Museums Programs, 1998), pp. 6-7.

the shortness of the conflict rendered its means – the mass gassing of women and children – moral.

In the aftermath of World War I, there was one major technical question that drew the attention of chemical warfare enthusiasts. Could chemical agents be rendered as precise and as accurate as other weapons systems? There were two possible routes to an answer. First, were there any new chemical agents to be discovered that might be more precise and less dependent on wind, rain, temperature and other weather conditions? And second, could a new delivery system deliver the sort of precision that could never be achieved in the First World War. For both Germany and the Soviet Union, the central operational question was whether or not CW could be effectively used in conjunction with mobile, offensive operations.

During the war, the German Army grouped their chemical weapons into four classifications. *Gelbkreuz* (Yellow Cross) was used to mark all artillery shells containing vesicants: blister or skin-affecting agents like mustard gas. *Blaukreuz* (Blue Cross) meant respiratory agents, like chlorine. *Grünkreuz* was used for pulmonary agents, such as phosgene. Finally, *Weißkreuz* (White Cross) signified lachrymatory agents, like tear gas. Until 1936, none of the major powers synthesized any new chemical agents significantly different from these four primary types used in the First World War.³⁷⁰ That year, a

³⁷⁰ The one major new agent introduced after the war was Lewisite. Created by the American chemical weapons program, it was a vesicant like mustard gas, but its chemical composition included arsenic, rather than sulfur. Lewisite had similar properties to mustard gas, but was better suited to combat: it caused blistering immediately, rather than after a few hours like sulfur-based mustard gas. Although humanitarian concerns were certainly not a major selling point, wounds from Lewisite healed much more rapidly and completely than mustard gas injuries. See Joel Vilensky, *Dew of Death: The Story of Lewisite, America's World War I Weapon of Mass Destruction* (Bloomington, IN: Indiana University Press, 2005).

German team researching pesticides at IG Farben would stumble upon Tabun, the first of the nerve agents. But until that time, research efforts in Germany centered on streamlining production methods, extending the period of lethality, and improving delivery methods, rather than devising new agents. In 1933, the German team assigned to develop new gas warfare agents concluded that there were none to be found.³⁷¹

The Soviets, for their part, failed to devise any new chemical agents of note during the same period, but actively pursued new CW agents. For instance, a 1931 VOKhIMU report sent to Mikhail Tukhachevsky recorded that a Doctor Speransky had been seconded to VOKhIMU's Luga Chemical Testing Grounds for a chemical weapons "project."³⁷² Alexei Speransky, then at the Leningrad Institute of Experimental Medicine, was a pathologist specializing in the human nervous system.³⁷³ His presence at Luga strongly suggests that VOKhIMU was investigating the possibility of chemical nerve agents, though there is no evidence they developed any effective ones before the German discovery of Tabun.

There was another field of new development investigated in the Soviet Union. Germany had pioneered chemical weapons use because of the strength of its chemical industry and its network of academic and business experts.³⁷⁴ While Soviet chemical

³⁷¹ Zeidler, p. 202.

³⁷² "V Sekretariat Zam. Pred. RVS SSSP Tov. Tukhachevskogo [To the secretariat of the Deputy Head of the Armed Forces of the USSR, Comrade Tukhachevsky]," 11 October, 1931, 33988/3/162, 18, RGVA, p. 1.

³⁷³ He was also probably the most famous Soviet neurophysicist; he was nominated by his peers for the Nobel Prize eight times.

³⁷⁴ And one might add the fact that the moral repugnance of initiating the use of chemical weapons was more palatable to the Germans and their "way of war" than it was to the Entente. Despite Haber's claims to the contrary, chemical warfare was illegal under international law, and he was the first to propose, design and supervise the deployment of fatal chemical agents in combat. While he claimed that the French had used lachrymatory agents first, thus justifying the first use of chlorine, even he must have realized the

industry lagged far behind its rivals, the Soviets had advantages which inclined them towards developments in the realm of biological weapons. These included a long history of treating outbreaks of contagious diseases, ranging from *bacillus anthracis* to typhus.³⁷⁵ As a result, the Soviet Union possessed, from its inception, a reasonably strong network of medical laboratories and facilities dedicated to the treatment of such contagions. The RVS conducted some independent work in the realm of animal biology before 1925, but it was Yakov Fishman who first proposed its systematic weaponization.³⁷⁶ In 1928, he sent a detailed report to Voroshilov about the defensive and offensive possibilities of biological warfare.³⁷⁷ Fishman also wrote that VOKhIMU had already set up the “Scientific Research Institute of Health in Moscow” under a biologist named Nikolay N. Ginsburg to begin working on weaponizing *bacillus anthracis*.³⁷⁸ It appears that the OGPU also began investigating the possibilities of biological warfare around the same time, leading to a proliferation of competing laboratories: three in Moscow, four in Leningrad and three other open-air testing grounds.³⁷⁹

Cooperation between Germany and the Soviet Union in chemical warfare did not lead to joint work on biological weapons. The Reichswehr was uninterested in biological warfare for a number of reasons, including the strength of their CW program and the fact

weakness of his argument. His first wife certainly had; a well-regarded chemist in her own right, she killed herself in 1915, supposedly over her husband’s perversion of the science she so loved. Stolzenberg, *Fritz Haber*, pp. 175-178.

³⁷⁵ Milton Leitenberg, Raymond A. Zilinskas, *The Soviet Biological Weapons Program: A History* (Cambridge, MA: Harvard University Press), pp. 18-22.

³⁷⁶ *Ibid*, p. 20.

³⁷⁷ *Ibid*, p. 20.

³⁷⁸ *Ibid*, p. 20-21.

³⁷⁹ *Ibid*, p. 21.

that biological weapons could not be used tactically.³⁸⁰ With both VOKhIMU and the OGPU working on biological weaponry, by 1939, the Red Army had the most advanced BW program in the world, with its only close competitor being Japan.³⁸¹

While chemical agents advanced little until Tabun was discovered, a great deal of change occurred in delivery systems. At the end of the First World War, even as gases deployed grew more effective, dispersal methods lagged behind. In the early phases of chemical usage, German chemical battalions had simply waited for a wind of the requisite strength and direction, and opened valves on large gas canisters. As the war progressed, both sides used gas-filled artillery shells, which came with their own technical issues. The British also relied on the Livens Projector, a very crude mortar that threw small barrels of chemical agents at the enemy. Still seeking a better deployment method, towards the end of the war, the Allies filled train cars with chemical agents, accelerated the train towards the front at top speed, and then opened the chemical valves as the train decelerated, creating a cloud that would drift across the German lines.³⁸² But all of these methods were imprecise and risked endangering one's own troops.

Veterans of the chemical battalions in World War I believed that the future of chemical warfare lay in aerial delivery. The British scientists at Porton Down were testing chemical aero-bombs in 1918, but they were not used during the First World War.

³⁸⁰ Leitenberg, Zilinskas, p. 19.

³⁸¹ The United States established its BW program in 1943. "Germany, Italy and Poland had no offensive BW Programs and, at most, rudimentary defensive programs." Leitenberg, Zilinskas, p. 26. Great Britain's program began in 1937; and the French program predated the others, but was small in scale. Only Japan's program was significant in scope – and actually saw use against the Chinese during the Second Sino-Japanese War. G.B. Carter, p. 46.

³⁸² Harris, Paxman, p. 32.

The Red Army used chemical aviation at least once in 1919 during the Russian Civil War.³⁸³ And according to Russian reports, the Germans had begun developing a phosgene air bomb in 1918, but it was never deployed in combat.³⁸⁴ To all keen observers, chemical aviation was the future of chemical warfare.

The primary delivery system proposed was the chemical aero-bomb [*aerokhimbomb* in Russian]. In the 1920s, these were ordinance containing a timed fuse and explosive designed to detonate above the ground for maximum dispersal. The other possibility pursued during the interwar period was the use of chemical sprayers, similar to those used in pesticide crop dusting. Flying low, aircraft could saturate large areas evenly with a properly designed sprayer. However, each of these technologies required significant adjustment to the chemical agents themselves to maintain dense concentrations capable of wounding or killing enemy combatants.

The interwar period also saw an evolution in chemical deployment technologies on the ground. Advances in artillery and chemical ordinance meant slight improvements in effectiveness. In a new departure, the Soviets in particular focused on the development of “chemical tanks,” specially insulated vehicles capable of protecting those inside while spewing a lethal dose of certain chemical agents. Both the Germans and Soviets also worked on combining sprayer technology with commercial motor vehicles. These

³⁸³ Fishman, “Betrieb: Erscheinungsformen der chemischen Luftwaffe [Subject: Forms of the Chemical Air Force],” p. 1.

³⁸⁴ “Doklad itogakh raboti gostei za 1930 g. [Report on the results of work by the guests for 1930,” 15.1.1931, 33988/3/162, l. 10, RGVA, pp. 6-7. Whether this is true or not seems uncertain; Sonderkommando Z noted in a report dated 1924 that “Chemical aviation: since we have no prior experience in this field, I am unable to nominate a candidate. But I will get in touch with Stolzenberg.” “Fl.N.Nr. 4” August 8, 1924, RH2/2216/311-312, BA-MA, pp. 1-2.

vehicles would be able to coat roadways and other surfaces, with toxic agents rendering them impassable to enemy ground forces.

While engineers and scientists sought to improve the technical elements of gas warfare, officers in the major powers worked on predicting how the new possibilities in CW would integrate with their own operational doctrines. The theoretical basis for chemical aviation came from a number of sources.³⁸⁵ The first was the United States, which paved the way for work done elsewhere. The Soviets and Germans paid close attention to American work done in the field, much of which was (more or less) public.³⁸⁶ American General Amos Fries, the second head of the US Chemical Warfare Service, had written in a book in 1920 that “while chemicals were not used by the Air Service in the last war, it was even then realized that there was no material reason why they should not have been so used. That they will be used in the future by the Air Service, and probably on a large scale, is certain.”³⁸⁷ The following year, Army Air Force General

³⁸⁵ Col. Phillip S. Meilinger, “Giulio Douhet and the Origins of Airpower Theory” in *The Paths of Heaven: The Evolution of Airpower Theory*, Edited by Col Phillip S. Meilinger (Maxwell Air Force Base, Alabama: Air University Press, 1997), p. 17. Douhet’s concept of strategic bombardment called for the combination of explosive, incendiary and chemical bombs, which he claimed would enable the annihilation of urban centers with relative ease. But his writings were not translated into Russian and German until 1935, and as a result, his influence on interwar chemical weapons doctrine in those two states was limited. Douhet’s name is not mentioned in Reichswehr correspondence about chemical weapons, nor does it appear in Soviet discussions before 1933. The direct impact of Douhet’s writings on the German and Soviet Air Forces was limited until 1935 (when he was translated into German and Russian), by which time Tomka had closed. Seeckt in Germany and Tukhachevsky in the Soviet Union reached similar conclusions about strategic bombing in the 1920s: namely, that air supremacy was the primary goal of air power, and that its achievement should lead to the use of offensive power against military targets to disrupt operational capabilities, rather than targeting civilians and cities. This ran counter to Douhet’s primary arguments. But both apparently saw the merits in combining chemical weapons with aviation technology. Douhet’s role has been exaggerated by some, such as Sally Stoecker.

³⁸⁶ American experiments are mentioned repeatedly by authors in both the German *Militär-Wochenblatt* and the Soviet *Voyna i Tekhnika* in the early 1920s.

³⁸⁷ Amos A. Fries and Clarence J. West, “The Future of Chemical Warfare,” Chapter 26 in *Chemical Warfare* (New York: McGraw-Hill, 1921), pp. 435-39, p. 436.

<http://womhist.alexanderstreet.com/chemwar/doc7.htm>

Billy Mitchell had testified before Congress that “the combination of chemical weapons and aircraft could effectively ‘kill every inhabitant’ of New York City.”³⁸⁸ He followed up this pronouncement with a public display. On September 23, 1923, Mitchell organized a trial attack against the derelict USS *Alabama* using white phosphorus bombs.³⁸⁹

The Soviets paid close attention to these and other American tests. In a 1925 article, “Chemical Air Force Experiences,” which appeared in the Soviet military journal *Voina i Tekhnika*, Yakov Fishman wrote glowingly of “the American bombing experiment on the battleship *Alabama*.”³⁹⁰ He noted that the Americans had dropped a phosphorus bomb combined with a lachrymatory agent, noting that “its effect was such that the ‘experts’ could not board the ship for up to 45 minutes after the bombing of the ship without gas masks.”³⁹¹ He concluded his article with the note that “modern chemical weapons provide tremendous power when fully utilized with effective aviation.”³⁹²

But while observing the value of American testing, the Red Army had its own growing school of CW theorists. Fishman himself was the most prominent military author publishing on chemical warfare in the Red Army, penning *Gas Warfare* (1924), *Chemical Weapons* (1924), “The Logistics of Defending against Chemical Aviation” (1928), *Military Chemistry and Modern Warfare* (1930), “Chemical Defense and the Task of

³⁸⁸ Christopher A. Warren, “GAS, GAS, GAS! The Debate Over Chemical Warfare Between the World Wars,” *Federal History*, Issue 4, Jan2012, pp. 43-60. p. 55.

³⁸⁹ Fishman, “Betrieb: Erscheinungsformen der chemischen Luftwaffe [Subject: Forms of the Chemical Air Force].” Perhaps the greatest testament between the close cooperation between the CWS and the Army Air Corps was that Amos Fries, head of the American chemical weapons program, was the first witness called to testify on Billy Mitchell’s behalf during his court-martial in 1925. Thomas Iain Faith, “Under a Green Sea: The US Chemical Warfare Services, 1917-1929,” (Unpublished Dissertation, 2008), p. 119.

³⁹⁰ Fishman, Betrieb: Erscheinungsformen der chemischen Luftwaffe [Subject: Forms of the Chemical Air Force],” p. 2.

³⁹¹ Ibid.

³⁹² Ibid, p. 2.

Osoaviachim” (1931) and “Military Chemical Affairs (1933).³⁹³ Tukhachevsky and his cohort envisioned chemical weapons in a decisive role: in the Deep Battle masterpiece *Provisional Field Regulations for the Red Army, 1936* (PU-36), chemical warfare was mentioned 154 times in fewer than 120 pages.³⁹⁴ Its authors envisioned specialized chemical troops embedded within all other branches of the service, down to the platoon level.³⁹⁵

The Soviet Union emphasized chemical weapons production more than any of the other great powers in the interwar period.³⁹⁶ Why did the Soviet Union invest so much money into a program that, as it turned out, would play no part in the Great Patriotic War? The unique Soviet view of technology played a role: Joachim Krause and Charles Mallory argued that “the special importance attached to chemical weapons chemical weapons was initially the product of a deeply-felt inferiority to the Western countries.”³⁹⁷ As a defense weapon, CW clearly offered some deterrent power, valuable when the Soviet state felt surrounded and embattled. But by 1936, the conversation had shifted to both the *offensive* and defensive use of CW.³⁹⁸ Here, it is clear, the military futurists

³⁹³ V.N. Levichev, *Voyna i Voinnoe Delo: Posobie po voennomu delu dlya partiinogo, sovetskogo i profsouz'nogo aktiva* [War and Military Affairs: A Handbook on Military Affairs for Party, State and Trade Union Activists], (Moscow: Government Military Publishing House, 1933), pp. 339, 378; *Tekhnicheskaya Ensiklopedia* [Technical Encyclopedia], Vol. IV, edited by L.K. Martens (Moscow: Joint Society for the Soviet Encyclopedia, 1928), pp 98

³⁹⁴ “Provisional Field Regulations for the Red Army, 1936,” in *USSR Report, Military Affairs* (Springfield, VA: National Technical Information Service Reproduction, 1986), pp. 1-125.

³⁹⁵ *Ibid.*, p. 24.

³⁹⁶ Krause and Mallory, p. 34.

³⁹⁷ *Ibid.*, p. 34.

³⁹⁸ As Krause and Mallory rightly point out, as ideas of deep battle evolved, planners were less and less sure how CW would fit into operations. CW seemed to inhibit rapid movement, rather than encourage it. As a result, PU-36, which emphasized CW so heavily, placed the strongest language on CW defense, rather than its use in conjunction with the fast moving armored spearpoints which were Deep Battle’s most important feature. Krause, Mallory, pp. 78-80.

played a part. Soviet and German documents emphasize that a turning point in the attitudes of senior Soviet political figures to chemical warfare came with the beginning of aerial CW tests which demonstrated the potential use of poison gas against cities. They attracted the personal interest of Stalin.³⁹⁹

While major doctrinal debates about the deployment of chemical weapons raged in Soviet military circles, there was surprisingly little intellectual discussion of the deployment of chemical weapons in Germany. In the immediate aftermath of the war, the doctrinal uses of gas warfare did receive a great deal of attention: in the early 1920s, “within the Reichswehr’s General Staff, the enthusiasm for gas warfare was certainly stronger than within the General Staffs of the victorious Allies.”⁴⁰⁰ Seeckt ordered discussion groups to be held on the uses of poison gas in 1923 and 1924.⁴⁰¹ He also specifically mentioned the need for all infantry to deploy with gas masks at the ready in the maneuvers of 1923, 1924 and 1925, criticizing commanders who failed to prepare their troops.⁴⁰² Several histories recounting the history of gas warfare in the First World War appeared in the 1920s as well, such as Dr. Rudolph Hanslian’s *Der Chemische Krieg*. In the German Army Journal *Militär-Wochenblatt*, 1924 and 1925 saw a spate of publications about poison gas and gas warfare. Some of the more farsighted publications

³⁹⁹ Sergey Alexeyvich Gorlov, *Sovershenno Sektreno: Alianz Moskva-Berlin, 1920-1933* [Top Secret: Alliance Moscow-Berlin, 1920-1933] (Moscow: Olma Press, 2001), p. 127.

⁴⁰⁰ James Corum, *The Roots of Blitzkrieg: Hans von Seeckt and German Military Reform* (Lawrence, KS: University of Kansas Press, 1992), p. 106.

⁴⁰¹ Ibid, pp. 101-102.

⁴⁰² Citino, *The Path to Blitzkrieg: Doctrine and Training in the German Army, 1920-1939*, pp. 52, 59.

included a back-and-forth between future SS armored officer Wilhelm Brandt and Lieutenant Ernst Volckheim about the use of gas warfare in conjunction with tanks.⁴⁰³

Yet the publications and interest in gas warfare faded over the course of the 1920s. By 1933, gas warfare had little place in German operational doctrine and was mentioned in training manuals almost exclusively in the context of defense against gas attack: “the Germans embarked upon the Second World War with a chemical warfare component of its doctrine that was not only primarily of a defensive orientation, but was also poor in terms of both quality and quantity.”⁴⁰⁴ Historian Günther Gellerman argued that this lack of chemical warfare doctrine proved to be a major reason why gas was not used by the Wehrmacht during the war.⁴⁰⁵ To some, this decline in German interest has seemed inexplicable. But, as this chapter argues, the nature of technical testing conducted inside the Soviet Union revealed the incompatibility of German operational doctrine and the use of poison gas.

PODOSINKI, 1926-1927

Beginning in April of 1926, talks began between German and Russian representatives on the establishment of a jointly operated chemical weapons laboratory dedicated to exploring chemical dispersal techniques. In May of that year, *Section Z*'s

⁴⁰³ Ernst Volckheim, “Gas und Kampfwagen [Poison Gas and Tanks],” January 1925, *Der Kampfwagen*, Issue Nr. 4, p. 1.

⁴⁰⁴ Krause and Mallory, p. 75.

⁴⁰⁵ See Günther Gellerman, *Der Krieg, der nicht stattfand. Möglichkeiten, Überlegungen und Entscheidungen der deutschen Obersten Führung zur Verwendung chemischer Kampfstoffe im Zweiten Weltkrieg* [The War that Never Happened: Options, Considerations and Choices of the German Supreme Command regarding the Use of Chemical Weapons in World War II] (Bonn, Germany: Bernard und Graefe, 1986).

chief, Hermann von der Lieth-Thomsen and Soviet Deputy Commissar for Defense Josef Unschlikht began to discuss the practicalities of a joint facility, initially discussing a site called “Luga” near Leningrad. But by July, Luga was rejected in favor of a military base just southeast of Moscow.

As the summer dragged on, the Reichswehr grew increasingly eager to formalize an agreement. Seeckt hoped to resume CW testing that year, and wanted to have an agreement in place before winter conditions in the Soviet Union rendered testing impossible. On August 19, a team including, Lieth-Thomsen, Captain Kurt Student and Yakov Fishman visited the site.⁴⁰⁶ On August 21, 1926, the two sides signed a formal cooperative agreement establishing a joint chemical weapons testing facility.⁴⁰⁷ The base’s technical work would be managed by German scientists and military officers, while its administration would be managed by a Soviet officer. Soviet chemists would participate fully in the work, gaining expertise in the process. The Soviets added a provision to the contract stating that the leading Soviet officer at the facility, or his deputy, must be present at all experiments and weapons testing.⁴⁰⁸

The site selected by Fishman and the Soviet side was Podosinki, a forested estate formerly owned by Prince Golitsyn. To reach the site, a train from central Moscow ran southeastwards in the direction of Ryazan, first passing Kuzminki Park. Only a few miles beyond, near the rail station of Uchtomskaya, lay the military complex at Podosinki (confusingly, the name of the next nearest rail station). The site itself was only 20

⁴⁰⁶ Zeidler, p.140. Kurt Student was a future Luftwaffe General and commander of the *Fallschirmjäger*, the German Paratroopers.

⁴⁰⁷ Gorlov, pp. 134-5.

⁴⁰⁸ Ibid, p. 135.

kilometers from the Kremlin. The base was the home of the Moscow Military District's Gas Battalion as well as a neighboring Red Air Force airfield.⁴⁰⁹ The gas battalion in 1926 numbered 600 men. Their Podosinki base was fully operational in 1926, "as numerous experimental craters and the strong smell of mustard gas testified."⁴¹⁰ The facility had opened as a "gas artillery range" back in 1918, although major chemical weapons testing did not begin until 1925.⁴¹¹ The German team expressed some concern about the close proximity of Moscow's suburbs to the airfield and testing field, but Fishman assured them that he "took full and total responsibility for all the trials" and any possible civilian casualties that might result.⁴¹² But Moscow's proximity proved a hindrance to the aerial bombardment tests the Germans and Soviets wished to run at Podosinki.

In September 1926, a team of 12 German scientists, engineers and pilots journeyed to Moscow to begin work at the facility.⁴¹³ The intention of the agreement signed in August 1926 was to manufacture small quantities of chemical agents for testing purposes: two tons of lachrymatory agents were expected during the first four months of

⁴⁰⁹ Zeidler, 140.

⁴¹⁰ Ibid, 140.

⁴¹¹ Katys, "Voenno-Khimicheskie Poligon v Moskve [The Military Chemical Testing Grounds - in Moscow]."

⁴¹² "Erfahrungen und Eindrücke bei den Arbeiten der Gruppe Amberg [Experiences and impressions on the work of the group Amberg]," December 17, 1926, RH/2/2297/610-612, BA-MA, pp. 1-4.

⁴¹³ The Reichswehr used the previously mentioned *GELA* as a logical cover for German operations in chemical and biological warfare. The team members were listed as "employees" of GELA, under the pretext of working on agricultural pesticides. This was logical, as pesticides and dyes were the two industries most readily transferrable to chemical weapons production, and so they were used to disguise German activities both within Germany and without. Thus, most of the technical specialists and scientists involved were drawn from corporations or universities where they were involved in pesticide development for agricultural use.

operation.⁴¹⁴ These agents would then be used in conjunction with aircraft to test the possibilities of aerial bombardment with chemical weapons. However, the German *GELA* team which reached Podosinki in the fall of 1926 was in for a rude surprise. There were almost no facilities present. Materials that had been shipped from Germany before their departure had not yet been delivered, some arriving only four weeks later.⁴¹⁵ Almost nothing was available in Moscow for construction. The head of this first team complained that even “every single hammer will have to be obtained from Germany!”⁴¹⁶

The German research group was led by Hans Hackmack, a youthful pilot (b. 1897) who served in the First World War. He spent the years from 1923 to 1925 as a flight instructor in the Soviet Union, near Lipetsk. Importantly, Hackmack was friends with Erhard Milch, a major figure in the history of German air power, who in 1926 (as an employee of Junkers) would oversee the creation of Lufthansa.⁴¹⁷ Hackmack, who would go by the alias Amberg during his time in the Soviet Union, was repeatedly lauded by his military superiors as a good organizer and manager, and for handling the often-prickly personalities of the civilian academics under his management despite being decades their junior.⁴¹⁸

⁴¹⁴ Dr. Otto Muntch “Fl. Bericht Nr. 106 von 24 Sept. [Fl. Report Nr. 106 from September 24]” September 29, 1926, RH2/2216/117-, BA-MA, pp. 1-.

⁴¹⁵ Muntch, “Fl. Bericht Nr. 106 von 24 Sept.,” p. 2.

⁴¹⁶ Ibid.

⁴¹⁷ James Neal Harvey, *Sharks of the Air: Willy Messerschmidt and How He Built the World's First Operational Jet Fighter* (Havertown, PA: Casemate Publishers, 2011) p. 26.

⁴¹⁸ Lieth-Thomsen described Amberg's/Hackmack's performance as the head of the unit: “The leader of the group, Mr. Amberg has performed quite extraordinarily; his task was very difficult; not only in terms of the organization and the technical performance of the company, but in particular in relation to cooperation with the Russian organizations and personalities, as well as with the different elements in his own group. He has been tireless every day, and has managed, despite his relative youth, to overcome difficulties and critical situations in his personal relationships [with the staff].” Lieth-Thomsen, “Erfahrungen und Eindrücke bei den Arbeiten der Gruppe Amberg [Experiences and impressions on the work of the group Amberg],”

Hackmack's role was complicated by Soviet policies towards the Germans in their midst. In October 1926, the Red Army liaison passed Hackmack a copy of "Rules for Guests," a 29-point guideline for German behavior at Podosinki penned by Fishman's assistant, L. Artmann.⁴¹⁹ German guests were forbidden to travel to Moscow without permission, and then only in groups of "two or smaller." Germans were forbidden from congregating outside their facilities, talking with Russian guards or officers not directly involved in the work, or walking to any other buildings around the military airfield besides the ones in which they were quartered or working. The second-to-last point added emphatically that "you cannot point to ignorance or lack of understanding of the Russian language as a reason for departing from the present instructions," as the instruction had been translated into German for the benefit of the guests.⁴²⁰ In other words, the Germans present were treated as if they were some sort of capitalist bacilli that might contaminate all of the Red Army officers with whom they came into contact. Mediating between Red Army requirements and the expectations of his mostly civilian team consumed much of Hackmack's time.

Seeckt and the German side viewed their mission with some urgency and attempted to expedite the establishment of the facility over the summer of 1926, but they ran into bureaucratic issues in the USSR. Their principal ally in the endeavor, Jakob Fishman, had just been appointed as the head of VOKhIMU and had limited powers.

December 17, 1926, RH/2/2297/610-612, BA-MA, pp. 1-4, p. 2. Hackmark, who continued to work as a test-pilot for the Reichswehr, died after bailing out of a test aircraft in 1929.

⁴¹⁹ "Instruktion Für Die Gaeste [Instruction for the Guests]," October 28, 1926, RH/2/2304/28-31, BA-MA, pp. 1-3.

⁴²⁰ Ibid.

Section Z noted that “his goodwill for the common cause certainly cannot be denied, but apparently he lacked the necessary support in his own ranks.”⁴²¹ Niedermayer wrote in November 1926 that Fishman “constantly issues orders that are either not complied with, or under the circumstances, cannot be followed.”⁴²² VOKhIMU’s lack of resources rapidly became apparent to the Germans. Given that the facility was so close to Moscow, the German team expected some of the comforts of home “with respect to accommodation and meals.”⁴²³ But concerns regarding secrecy and a terrible housing shortage in Moscow derailed that possibility, and by the end of August, it had been agreed that temporary shelters would be set up directly on site.

The housing issue at Podosinki proved particularly vexing. Instead of apartments in Moscow, the Germans present, four of whom were middle-aged academics, reported that while living at Podosinki “we are like gypsies camping in a remote forest in an idyllic area, but under the most primitive of conditions.”⁴²⁴ The group’s doctor, Otto Muntsch, added that “we live in the wet and cold in a single room, the [Russian] watchmen bring us buckets of rainwater, and the lowest of household tasks we perform in rotation.”⁴²⁵ In particular, the team complained about the food: they lived off of nothing more than tea and sausage.⁴²⁶ In a report back to Berlin, Muntsch reported that “in the long term this is unsustainable physically, mentally and spiritually because it is makes

⁴²¹ Zeidler, p. 141.

⁴²² Ibid.

⁴²³ Muntsch, “Fl. Bericht Nr. 106 von 24 Sept. [Flight Report Nr. 106 from September 24],” p. 4.

⁴²⁴ Ibid, p. 4. This report and others frequently reveal hints of German racial attitudes: they often subtly or overtly reference racial notions of German superiority and Slavic backwardness. Doubtless their preconceived notions were exacerbated by the poverty of Russia in the aftermath of the Russian Civil War.

⁴²⁵ Ibid.

⁴²⁶ Ibid.

such outrageous demands of will, energy and asceticism” just to survive.⁴²⁷ He added, however, that “the experimental work itself I find extremely interesting.”⁴²⁸

That work began in September, shortly after the team’s arrival. It was initially only “preliminary” in nature, as most of September and October were spent improving the facilities at the station.⁴²⁹ Beginning in November, however, primary research began at the site. At that point, the German team began conducting forty tests involving spraying “neutral agents” which resembled mustard gas from various heights to test dispersion.⁴³⁰ Using aircraft from the nearby airfield, the Germans dropped five tons of chemical agents in fourteen different bomb and sprayer configurations, testing concentration and dispersion of the agents.⁴³¹ Other work conducted in the fall of 1926 at Podosinki included the testing of bombing timers, new percussion fuses, the development of an effective aero-bomb, the testing of a chemical “tank” built by Krupp and the degassing of contaminated terrain.⁴³² It was a substantial achievement given the immense difficulties of operating at Podosinki.

Of these technical tests, it was chemical aviation which was the central aim of the month of testing in 1926. The German team found its results limited by the frequently inclement weather throughout November, which handicapped both flying time and proper

⁴²⁷ Muntsch, “Fl. Bericht Nr. 106 von 24 Sept. [Flight Report Nr. 106 from September 24],” p. 4.

⁴²⁸ Ibid, p. 5.

⁴²⁹ Hans Hackmack, “Schlussbericht 1926 [Final Report 1926],” December 21, 1926, RH/2/2304/32-40, BA-MA, p. 1.

⁴³⁰ Gorlov, 136-137.

⁴³¹ Hackmack, “Schlussbericht 1926 [Final Report 1926],” p. 3.

⁴³² Gorlov, p. 223.

preparation of the bombing site.⁴³³ But despite some bad weather, the testing revealed the possibilities of aerial chemical warfare. Hackmack's reports to Lieth-Thomsen and Section Z grew in confidence as the fall passed. He wrote in the last report of 1926 that "the results [at Podosinki] are very valuable in spite of the difficulties..."⁴³⁴ But Reichswehr leadership, and more importantly, their Soviet hosts, seem to have been less sure.

With weather conditions getting worse (and the cold impacting test results) *Gruppe Amberg* decided to hold a major demonstration of their results to date. The first week of December 1926, Colonel Lieth-Thomsen, accompanied by Yakov Fishman and Deputy Commissar for Defense Unschlikht arrived at Podosinki for a presentation of the German efforts.⁴³⁵ These involved releasing chemical agents from an aircraft at a number of different heights onto the testing ground. Hackmack wrote of the testing that "the large quantities of chemical warfare agents used in the aerial tests give [us] very instructive and extensive material which already allows [us] to draw precise conclusions on evacuations and organization for emergencies, etc."⁴³⁶ What he meant by "evacuations and organization" was the preparation of Germany's cities against massive CW aerial bombardment. In Hackmack's mind, and that of his team, this was the beginning of a new era in warfare, where the systematic bombing of civilian populations with chemical agents would now be a vital tool in the military arsenals of the Great Powers.

⁴³³ Colonel Hermann von Der Lieth-Thomsen, "Erfahrungen und Eindrücke bei den Arbeiten der Gruppe Amberg [Experiences and impressions on the work of the group Amberg]," December 17, 1926, RH/2/2297/610-612, BA-MA, pp. 1-4, p. 2

⁴³⁴ Hackmack, "Schlussbericht 1926 [Final Report 1926]," p. 3.

⁴³⁵ Gorlov, pp. 136-137.

⁴³⁶ Hackmack, "Schlussbericht 1926 [Final Report 1926]," p. 4.

Writing some two weeks after the exercise, Lieth-Thomsen described the test as a tremendous success. “Initially Fi[shman] has had to fight by himself to gain the interest of higher agencies for these experiments.” But, Lieth-Thomsen noted, “The interest on the part of the Russians has grown rapidly during the experiments.”⁴³⁷ The observation was an astute one: two weeks later, Unschlikt would write to Stalin and the Politburo, “The use of mustard gas via aviation for the purposes of contamination and attacking human settlements is technically possible and of great value.”⁴³⁸ With the success of the December demonstration at Podosinki, the Soviets agreed to an expansion of the cooperative chemical weapons program. In addition, Fishman gained vital political support: VOKhIMU’s research budget increased more than 60 percent between 1926 and 1927.⁴³⁹ However, Podosinki’s brief role in Soviet-German cooperation was nearing an end.

THE END OF PodosINKI, 1927

On a quiet Thursday evening in March 1927, a Russian cook ran into German army mechanic P. Thoms’ room.⁴⁴⁰ He said that he smelled smoke. Thoms must have had a sinking feeling at those words. The two men rushed into the kitchen, checked the furnace, and could find no source of the smell, which was growing stronger by the

⁴³⁷ Colonel Hermann von der Lieth-Thomsen, “Erfahrungen und Eindrücke bei den Arbeiten der Gruppe Amberg [Experiences and impressions on the work of the group Amberg],” December 17, 1926, RH/2/2297/610-612, BA-MA, pp. 1-4, P. 3

⁴³⁸ Gorlov, p. 127.

⁴³⁹ Fishman, “Kratkii Doklad o Rabote Khimicheskogo Komiteta VOKhIMU za 1926-1927 God I o Plane Rabote na 1927-1928 gg [Short Report on the Work of the Chemical Committee VOKhIMU for 1926-1927 and the Plan of Work for the 1927-1928 year],” p. 3. In 1926-1927, VOKhIMU’s research budget was 536,359 rubles. In 1927-1928, it was 858,000.

⁴⁴⁰ Thoms, “Bericht über die Feuersbrunst im Wohnhaus Po. der Gruppe Amberg [Report on the fire in the house Po. the group Amberg], March 31, 1927, RH/2/2304/56-58, BA-MA, p. 1.

minute.⁴⁴¹ Thoms decided he would check upstairs. Opening the door to a large storage room, he was greeted with a wave of heat and choking smoke. He must have felt tremendous fear at that moment.

Thoms' struggled against the heat and smoke.⁴⁴² He was not sure what chemicals might be in the cloud of smoke filling the room, but it could be deadly.⁴⁴³ He knew he had to get to a gas mask. With visibility no greater than an arms' length, Thoms reported that "I tried to get into the room to reach the place where the gas masks [hung] in a straight line, but that did not seem possible, because I was half-fainting in the stifling smoke and had to grope for the exit."⁴⁴⁴ Coughing and gasping, he dashed back down the stairs. At that moment, another German mechanic, Herr Jakob, ran up, accompanied by a few Russian guards. One had brought a gas mask with him. Jakob took the mask and made another effort at the upstairs room. Braving the heat and smoke, he managed to return with a pair of heavier German gas-masks, then collapsed half-conscious outside the building. Thoms attempted to use the rescued masks to investigate the fire, but found the "fumes from inside had penetrated into the seams" of the masks, rendering them useless.⁴⁴⁵

Elsewhere in the building vital laboratory equipment was at risk. After the Russian guards tried and failed to extinguish the blaze, the group began rapidly evacuating all material from the building. Throwing water on the floor and closing doors

⁴⁴¹ Thoms, p. 1.

⁴⁴² Ibid.

⁴⁴³ Ibid.

⁴⁴⁴ Ibid, p. 1-2.

⁴⁴⁵ Ibid, p. 2.

to slow the fire, the Russian guards managed to save all the materiel from the lower floors. Jakob and Thoms had to restrain one of the Russian soldiers who tried to brave the fire upstairs by himself – by that time it was too late to contain the blaze. Just as the men managed to drag the building’s portable electrical generator outside, “the house went up in flames.”⁴⁴⁶ It was a little after midnight on a cold April night, and the crew began sifting through the goods they had managed to salvage; shortly thereafter, a truck from the Moscow fire department arrived on scene, too late to do any good.⁴⁴⁷

Even before the fire, the Germans had sought a new facility elsewhere. Lieth-Thomsen had written back to Germany in December 1926 that the facilities at Podosinki have “proved to be completely unsuitable.”⁴⁴⁸ He added that “it seems desirable... to significantly expand these experiments in scope.”⁴⁴⁹ Given the difficulties at Podosinki, this meant a new base elsewhere in the Soviet Union. Discussions had begun earlier that year about the possibility of moving to a site in the vicinity of Orenburg in the Urals. But when General Wilhelm Adam visited the site on May 3, 1927, accompanied by Hackmack, Niedermayer, and Fishman’s assistant Rockinson, the Germans recorded total dissatisfaction with it.⁴⁵⁰ They wrote that the site was too close to the city, too distant from European Russia (their clothes would be noticeable, they complained) and that it

⁴⁴⁶ Thoms, p. 2.

⁴⁴⁷ Ibid, p. 3.

⁴⁴⁸ Lieth-Thomsen, “Erfahrungen und Eindrücke bei den Arbeiten der Gruppe Amberg [Experiences and impressions on the work of the group Amberg],” p. 3.

⁴⁴⁹ Ibid, p. 3.

⁴⁵⁰ “Bericht über die Erkundung des Geländes Or. als Versuchsfeld für die gesamten Veredelungsarbeiten [Report on the exploration of the terrain near Or[enburg] as a testing ground for the entire processing work],” May 3, 1927, RH2/2304/139, BA-MA, pp. 1-8.

lacked water.⁴⁵¹ Perhaps political considerations colored their report, but in any case, Orenburg served only as a temporary testing ground during 1927 for a chemical defense maneuver.⁴⁵² Instead, Section Z, Fishman and the RVS settled on a site not far from Stolzenberg's chemical weapons plant, along the banks of the Volga River.

The Germans continued testing at Podosinki until July 20, 1927.⁴⁵³ But the lack of facilities and problems encountered had convinced the Reichswehr that Podosinki was not a long-term option. By the spring of 1927, Section Z was debating the best and fastest way to disengage from the site. Decontamination would “require the presence of the entire staff for 8-14 days and involves more dangers than the operation of the facility.”⁴⁵⁴ Instead, the Germans decided to board up the facility and turn it over to the Red Army, in exchange for a proviso that the Germans could rent it the following spring (1928) if they so desired.⁴⁵⁵

Podosinki may not have had a future as a cooperative facility, but it would remain a vitally important site for the Soviets. Even by 1927, it was rapidly becoming part of an integrated CW industry network in Moscow. Besides remaining the home of the Moscow Region Gas Battalion, VOKhIMU had established (with German help) a small mustard gas production facility at Podosinki. In addition, Fishman had tied in Podosinki's

⁴⁵¹ “Bericht über die Erkundung des Geländes Or. als Versuchsfeld für die gesamten Veredelungsarbeiten [Report on the exploration of the terrain near Or[enburg] as a testing ground for the entire processing work],” pp. 1-8.

⁴⁵² The Junkers scandal, political pressure and Seeckt's resignation had all hamstrung Soviet-German cooperation. Gorlov, p. 207.

⁴⁵³ “Zum dortigen Bericht vom 8.7, Ziffer 4. Betrifft: Veredelung [For local report of 8.7, Paragraph 4. Subject: Refining/Improvement],” July 7, 1927, RH/2/2304/222, BA-MA, pp. 1-4.

⁴⁵⁴ Ibid, p. 2.

⁴⁵⁵ Ibid, p. 1-4.

facilities to the testing of gas masks produced at the “Red Hero” Factory the nearby Moscow suburbs.⁴⁵⁶ Four chemical plants that had been built in Moscow also sent their production to Podosinki for testing. While Podosinki ceased to be relevant for Germany, it increased its importance for the Soviets.⁴⁵⁷

THE FOUNDATION OF TOMKA, 1927-1928

Negotiations for a new site for a chemical laboratory began before the closure of Podosinki. For reasons related to the unfolding Junkers scandal, 1927 saw a lull at all of the Soviet-German facilities, a period that Sergei Gorlov described as “the political pause.”⁴⁵⁸ As a result, no joint chemical weapons testing or work was conducted between July and December, 1927. But in December, political pressure in Germany relented. Zeidler argues that the major impetus for the end of the “political pause” was Foreign Minister Gustav Stresemann’s “coming around” to a position of support on the resumption of chemical weapons work on Russian soil. His tacit assent or the assumption

⁴⁵⁶ Gorlov, p. 224.

⁴⁵⁷ Podosinki had an interesting, if dark, final coda. In 1935, the Central Committee of the USSR began plans to reconstruct Moscow and develop large new suburbs for the continuing influx of workers.⁴⁵⁷ Podosinki stood on ground they hoped to develop. Thus, on October 7, 1937, the Red Army began decontamination work at Podosinki, unearthing “6972 chemical mines, 878 chemical artillery shells and 75 chemical [aero-]bombs.”⁴⁵⁷ They also dug up 946 barrels of mustard gas and 353 containers of prussic acid, phosgene, chlorine and arsenic, among others. The death toll among workers handling the disinfection process was very high.⁴⁵⁷ With the outbreak of World War II, the decommissioning process ceased and Podosinki again became a CW testing site; some work continued there as late as 1948. Without having completed its decontamination work, the military handed the site over to the civilian government of Moscow in 1961. Marina Katys, “The Military Chemical Landfill - Moscow,” Radio Liberty, 20.12.2000, Freedom Archives, <http://www.svoboda.org/content/transcript/24197763.html>

⁴⁵⁸ Gorlov, p. 224.

of such by General von Blomberg led to the resumption of CW work with the Red Army between December 1927 and February 1928.⁴⁵⁹

On February 23, 1928, a German team (led by Lieth-Thomsen) entered negotiations in Moscow.⁴⁶⁰ A few weeks later, the Russian and German negotiators visited a test site near the town of Volsk. The site was relatively close to the *Bersol* facility, had Volga River access, as well as large, open spaces for testing fields.⁴⁶¹ It was also isolated, more than 150 kilometers from the nearest towns of 100,000 or more residents (Saratov to the south and Syzran to the north). With the assent of both sides, construction on the site began a few months later. The site was codenamed “Tomka,” a reference to one of the two train stations near the Podosinki facility where staff had disembarked, *Ukhtomskaya*.⁴⁶² As the name reflected, “Tomka” was to be a new and improved version of the previous site, centered on the same testing and including many of the same personnel. However, the new site allowed a significant expansion of facilities, staff and opportunities for testing over the Podosinki site. Much like Podosinki, Fishman sought to integrate the new facility into a broader network of chemical laboratories and industry controlled by VOKhIMU. While Tomka was being built, a major Soviet base was also under construction six kilometers away, entitled the Central

⁴⁵⁹ Zeidler, p. 200.

⁴⁶⁰ Ibid, p. 199.

⁴⁶¹ The site had first been used as a military base in 1924, when the Soviet Union began testing tanks there. Lev Aleksandrovich Fedorov, *Khimicheskoe Oruzhie v Rossii: Istoria, Ekologia, Politika* [*Chemical Weapons in Russia: History, Ecology, Politics*] (Moscow: Center for Ecological Policy of Russia, 1994).

⁴⁶² Dr. Leopold von Sicherer, “Tomka: Ein Deutsches Geheim-Unternehmen Hinter dem Eisernen Vorhang in den Steppe des Wolga-Gebietes bei Wolsk in den Jahren 1928 mit 1931, Abbau 1933 [Tomka: A German Secret Operation behind the Iron Curtain in the steppe of the Volga region near Volsk in the years 1928 to 1933],” 1933, N 625/209, BA-MA, p. 3.

Military-Chemical Landfill of the Red Army (TsVHP).⁴⁶³ According to the Germans, this facility was appointed with similar laboratories and accommodations as Tomka. Although no Germans would reside at TsVHP, they were frequently invited there as guests.⁴⁶⁴

The framework agreement for Tomka was an extension of the one signed August 21, 1926 in Moscow by Lieth-Thomsen and Fishman: the two sides would share all scientific results, including film and photographs of all tests.⁴⁶⁵ In addition, the Soviets would have at least one representative at all tests.⁴⁶⁶ Even as the German team wrapped up its experiments at Podosinki, construction work was underway at Tomka. But it would not be until the end of 1928 that scientific work began at the facility.⁴⁶⁷

In the spring of 1928, twenty-nine men discreetly gathered in Berlin. They had been selected to staff the newly constructed chemical weapons facility near Volsk, Russia, in Saratov Oblast. There were a number of alumni of Podosinki in their ranks: 45-year-old Fritz Wirth, the senior scientist and best-known academic on the team; Thoms, the junior aircraft mechanic who had wintered at Podosinki in 1927 and risked his life fighting a fire; and a cameraman named Schmidt, whose responsibilities had included filming all of the camp's experiments.

The rest of the team included an accountant, two explosives experts, a medical doctor and his assistant, a university meteorologist, a toxicologist, two chemists, three

⁴⁶³ Yakov Fishman, "V Osnovnom Soglasen Uborevitchu, [A Summary of the Agreement, to Uborevich]" "30 December, 1930 , 33988/3/162, 165-141, l. 45, RGVA, pp. 1-25

⁴⁶⁴ Gorlov, p. 225.

⁴⁶⁵ Ibid.

⁴⁶⁶ Fishman, "V Osnovnom Soglasen Uborevitchu, [A Summary of the Agreement, to Uborevich], pp. 224-225.

⁴⁶⁷ Ibid, p. 224.

pilots, seven mechanics, one driver, one aircraft engineer, three laboratory technicians (graduate students in chemistry) and two animal keepers.⁴⁶⁸ This menagerie of German technical knowledge slipped out of Berlin in the late spring months of 1928. In the fall of 1928, the Reichswehr appointed Colonel (later Major General) Wilhelm von Trepper to head the facility at Tomka. Trepper, a 52-year old Prussian artillery officer, had been the functional head of Germany's gas warfare program in his position as the head of the Artillery Inspectorate (In-4) since 1925.⁴⁶⁹ To preserve the secrecy of the program, Trepper "resigned" from the Reichswehr effective on October 31, 1928, and was appointed commandant of Tomka effective the next day.⁴⁷⁰ Thus, in 1927, the center of gravity for Germany's chemical weapons program had shifted three thousand kilometers east to the banks of the Volga.

The German team members had a number of things in common. First, the officers involved in the work at Tomka were very young. Only two of its team members were over the age of 40. Perhaps not surprisingly, most were veterans of the First World War, a majority (of those whose military records are known) having served in artillery units. In addition, they were drawn from the "politically reliable" far-right: for instance, the camp chemist (Leopold von Sicherer) and the "Ground Research Expert" (Alexander von

⁴⁶⁸ Sicherer, "Tomka: Ein Deutsches Geheim-Unternehmen Hinter dem Eisernen Vorhang in den Steppe des Wolga-Gebietes bei Wolsk in den Jahren 1928 mit 1931, Abbau 1933 [Tomka: A German Secret Operation behind the Iron Curtain in the steppe of the Volga region near Wolsk in the years 1928 to 1933]," p. 3.

⁴⁶⁹ Zeidler, p. 199.

⁴⁷⁰ "Trepper, Wilhelm," Personenregister, *Lexikon der Wehrmacht*, <http://www.lexikon-der-wehrmacht.de/Personenregister/T/TrepperWilhelm.htm>

Grundherr) had been members of Franz Xavier von Epp's *Freikorps* unit, which had suppressed the communist uprising in Munich in 1919.⁴⁷¹

With the exception of Trepper, (who would arrive at Tomka on November 1, 1928), the Tomka staff traveled to the site during the spring of 1928. Divided into small groups of no larger than six, these teams journeyed either by train to Riga or by ferry to Leningrad, and from there by train to Moscow. Upon their arrival they were greeted by Oscar von Niedermayer, the representative of "Z."⁴⁷² After some recuperation and sightseeing organized by "Z," the groups of Germans boarded trains for distant Saratov. Twenty four hours later, they boarded a steamer on the banks of the Volga; they were informed this was because there were no roads to their final destination. A long ferry ride led to the small town of Volsk. There they switched to trucks and continued overland. One of the Germans later noted that when they reached the last tiny peasant village, Shikhany, before their destination, "the peasants of the village helped [with directions], because they knew, despite the strictest secrecy, that something was occurring at the site about six kilometers away."⁴⁷³

One of the reasons for this security leak was that the Red Army had temporarily taken over the school house in Shikhany, where the Germans would reside on blankets for a week while the first facilities were built. Like the other secret facilities in Russia,

⁴⁷¹ Epp would play a vital role in the rise of the Nazi Party. Among his early followers was Ernst Röhm, the first head of the S.A. Henning Sietz, "Es riecht nach Senf! Auf Einladung der Sowjets erprobten deutsche Militärs zwischen 1926 und 1933 an der Wolga chemische Kampfstoffe ["It smells like mustard! At the invitation of the Soviets tested German military between 1926 and 1933 chemical warfare agents on the Volga]," June 22, 2006, Die Zeit Online, pp. 1-4. <http://www.zeit.de/2006/26/A-Tomka>

⁴⁷² Ibid, p. 4.

⁴⁷³ Sietz, p. 5.

the Reichswehr provided much of the construction capital and materiel, while the Russians provided the labor for construction. The Russian construction teams on site first poured a concrete foundation for the living quarters and laid water pipes.⁴⁷⁴ Then they began to assemble the mass of equipment that had arrived from Germany.

Most of the buildings to be assembled at Tomka were pre-fabricated in Germany, disassembled and shipped 3,000 kilometers via rail and up the Volga to Tomka. Much as the Podosinki team had feared, every piece of equipment – down to bed linen and paper – had to be imported from Germany to make Tomka operational, following a long and circuitous route via rail and truck. These prefabricated buildings included barracks for housing, a medical lab and administration, a laboratory building, a hut for housing test animals and a protective tent for aircraft, all of which arrived in the spring and summer of 1928.⁴⁷⁵ In addition, Russian workers built a cellar for food supplies, as well as special tunnels for the storage of chemical weapons, gas masks and degassing equipment.⁴⁷⁶ The extreme local temperatures – ranging from -45° to 45° – required special accommodations.⁴⁷⁷ The Russians installed furnaces in every building, including storage facilities and the various cellars and tunnels, lest the extreme cold render the chemical agents inoperable for winter testing.⁴⁷⁸ Throughout this process, one German observer

⁴⁷⁴ Sicherer, “Tomka: Ein Deutsches Geheim-Unternehmen Hinter dem Eisernen Vorhang in den Steppe des Wolga-Gebietes bei Wolsk in den Jahren 1928 mit 1931, Abbau 1933 [Tomka: A German Secret Operation behind the Iron Curtain in the steppe of the Volga region near Volsk in the years 1928 to 1933],” p. 4.

⁴⁷⁵ Ibid, p. 5.

⁴⁷⁶ Ibid.

⁴⁷⁷ Müller, *So lebten und arbeiteten wir*, p. 5.

⁴⁷⁸ Sicherer, “Tomka: Ein Deutsches Geheim-Unternehmen Hinter dem Eisernen Vorhang in den Steppe des Wolga-Gebietes bei Wolsk in den Jahren 1928 mit 1931, Abbau 1933 [Tomka: A German Secret Operation behind the Iron Curtain in the steppe of the Volga region near Volsk in the years 1928 to 1933],” p. 5.

noted that the Russian workers were “very skilled, willing to work and always cheerful.”⁴⁷⁹

By August 1928, there were twenty-four wooden buildings on site.⁴⁸⁰ The Germans resided near the primary laboratory facilities, while separate residence barracks were built for the Russian team 200 meters away. Besides the work facilities, there was also an officers’ club – the ubiquitous *Offizierskasino*.⁴⁸¹ General von Blomberg, then *Chef des Truppenamts*, visited the Soviet Union in 1928 to inspect the Soviet-German facilities there.⁴⁸² He described the newly-built Tomka as “very well organized” and the staff “very effective.”⁴⁸³ It was a tremendous upgrade on the Podosinki facilities.

ORGANIZATION AND SOVIET-GERMAN RELATIONS

Tomka’s German and Soviet staff was organized into a number of divisions. Three sections – Aviation, Ground and Gas Defense – contained a number of teams working on specific technical questions or problems.⁴⁸⁴ The Aviation Research team was led initially by an officer named Voelcker. His responsibility was to supervise tests into spraying and aviation bombing techniques. The 31-year-old chemist Alexander von Grundherr headed the “ground research” team, whose primary work centered on new

⁴⁷⁹ Sicherer, p. 5.

⁴⁸⁰ Zeidler, p. 199.

⁴⁸¹ German officers paid 15 rubles to join and 1 ruble a month “for entertainment and the improvement of kasino facilities.” *Kasino-Ordnung [Casino Rules]*,” April 3, 1931, RH/12/I/63, 42, BA-MA, p. 1.

⁴⁸² This long visit also convinced him that only a totalitarian regime offered Germany a chance at rearmament and *Weltmacht*.

⁴⁸³ Zeidler, 198; quoting FL. Carsten, Reports, p. 220.

⁴⁸⁴ These teams were subdivided into an Artillery Group, Chemical Mine Group, Chemical Sprayer Group, Aviation Group, Chemical Tank Group, Degasification Group, “Hard” Gas Group (researching gasses designed to be durable enough to remain toxic over extended periods and through variable weather) and the Chemical Analysis Group.

dispersal methods for chemical agents, including “chemical tanks” and truck-mounted sprayers. A Dr. Wein headed the gas protection research division. Besides these three divisions, there were two at-large scientists at Tomka: the 29-year-old chemist Leopold von Sicherer and the biologist Wirth, who provided vital supervision and assistance to the research projects of the various teams.

Each research team was headed by a German with academic credentials. One to three German research assistants served in auxiliary capacities in each group. Each German team member was in turn shadowed by two to four Soviet scientists or assistants whose educational background matched that of the German with whom he was paired. Head chemist Leopold von Sicherer, for instance, had four Soviet chemists assigned to him, each of whom “had completed tertiary education.”⁴⁸⁵ The Soviet team members all spoke fluent German, and participated extensively in the work; Sicherer noted that “before them [the Russian academics] there were no secrets.”⁴⁸⁶ In total, there were around forty Soviet scientists and assistants living at Tomka alongside their German counterparts at any one time. In addition, there were a number of Russian guards, whom the Germans (perhaps incorrectly) identified as “Cossacks.”⁴⁸⁷

The facility at Tomka had two leaders, a German and a Soviet co-commandant. From 1928 to 1933, the German commandant was Wilhelm von Trepper. From 1930 until 1933, his Soviet counterpart was General Jan Matisevich Zhigur. A Latvian

⁴⁸⁵ Sicherer, “Tomka: Ein Deutsches Geheim-Unternehmen Hinter dem Eisernen Vorhang in den Steppe des Wolga-Gebietes bei Wolsk in den Jahren 1928 mit 1931, Abbau 1933 [Tomka: A German Secret Operation behind the Iron Curtain in the steppe of the Volga region near Wolsk in the years 1928 to 1933],” pp. 1-12, p. 7.

⁴⁸⁶ Ibid, p. 6.

⁴⁸⁷ Ibid, p. 7.

peasant by birth, Zhigur joined the Communist Party in 1912 when he was 17. During the First World War, he was drafted and served in the Tsarist Army, where a sterling combat record earned him a battlefield commission to lieutenant.⁴⁸⁸ In 1918, he joined the Red Army. After successful service in the Russian Civil War, Zhigur transferred to the GRU (the RKKA's military intelligence directorate), and saw a series of postings in China from 1925 to 1928 as a military adviser. After a brief stint as commander of the 96th Rifles Regiment in Saratov Oblast, in May 1930 he moved over to VOKhIMU where he was destined to spend the rest of his military career.⁴⁸⁹ Fishman had likely sought him out because of the traits identified by Zhigur's commanding officer in 1928: "Zhigur is characterized by a firmness of will and character, a sense of wit and deep insight, exceptional diligence and interest in scientific research."⁴⁹⁰ In addition, Zhigur spoke good German, having spent a brief stint in Germany on an exchange in 1927.⁴⁹¹ Upon transfer to VOKhIMU, he was immediately assigned to Tomka.⁴⁹² He met on a frequent basis with his German counterparts for formal and informal conversation; reports back to Berlin mentioned Zhigur's dry humor, his "friendly attitude" and the "favorable

⁴⁸⁸ Nikolai Semyonovich Cherushev, *Rasstrelyannaya Elita RKKA: Kombrigi I Im Ravnii, 1937-1941 [The Elite of the Red Army who were Shot, 1937-1941]*, (Moscow: Kukovo Pole Publishing, 2014), p. 90-91.

⁴⁸⁹ He would be promoted to head VOKhIMU's 1st Department, then took over Rockinson's job as the assistant head of VOKhIMU in 1933. As with so many exceptional Soviet officers, he would be tried during the military purges, and was executed in 1938.

⁴⁹⁰ Cherushev, pp. 90-91.

⁴⁹¹ "Nachrichten über r. Anschauungen, Versuche in chemischer Kriegsführung und Zusammenarbeiten mit uns [News about ideas, research in chemical warfare and cooperation with us]," September 5, 1931, RH12/4/55, 210, BA-MA, pp. 1-4; 15. Tätigkeitsbericht über die Zeit von 10-16.8.31 [15th Activity Report from the Period 10-16.8.31]," August 17, 1931, RH12/4/55, 196, BA-MA, pp. 2

⁴⁹² Cherushev, pp. 90-91.

impression” he transmitted back in Moscow of the work at Tomka, which increasing financial and political support for the cooperative work.⁴⁹³

Both sides’ leadership wanted frequent reports on the work at Kama. As a result, the two commandants collaborated in the drafting of reports to their respective military establishments. In part through that process, Trepper and Zhigur would develop a reasonably good working relationship, as would their German and Soviet subordinates.⁴⁹⁴ That took years of work, however: Sicherer recorded that fraternization between German and Russian staff members was strictly forbidden off-duty until 1929.⁴⁹⁵ But the close working and living conditions at Tomka, the isolation of the base, as well as the fact that all of the Soviet officers spoke German, led to increasingly amicable relations between the two sides. As Sicherer recalled, “twice a year, the Russian commander hosted a summer garden party in a forest glade, and once in the winter a drinking party in the Russian barracks. Consultation with the Russians was consistently good, and over the years, friendly relations developed.”⁴⁹⁶ Given the immense differences in ideology between the right-wing Germans and the communist Soviet officers, there was only one

⁴⁹³ “20. Tätigkeitsbericht über die Zeit von 12.9-18.9.31 [20th Activity Report],” September 9, 1931, RH12/4/55, 196, BA-MA, pp. 1.

⁴⁹⁴ The German commandant was responsible for drafting regular reports to the Truppenamt in Berlin. Initially, as at Podosinki, these were once-monthly reports. But the increased tempo of research led to the request from Niedermayer and Section Z for weekly reports. These were drafted by the German commandant, shown to the Russian commandant, who then drafted his own version of the report, then sent the German report via Red Army courier to *Section Z* in Moscow, who then sent the message back to Truppenamt Section T-3 via diplomatic pouch or cable from the German Embassy. The Russian commandant in turn sent his own report, which included material from the German report, back to VOKhIMU. “15. Tätigkeitsbericht über die Zeit von 10-16.8.31 [15th Activity report about Time 10-19.8.31],” August 17, 1931, RH12/4/55, 196, BA-MA, pp 1; Zeidler, 346; Sicherer, pp. 1-12; p. 6.)

⁴⁹⁵ Sicherer, “Tomka: Ein Deutsches Geheim-Unternehmen Hinter dem Eisernen Vorhang in den Steppe des Wolga-Gebietes bei Wolsk in den Jahren 1928 mit 1931, Abbau 1933 [Tomka: A German Secret Operation behind the Iron Curtain in the steppe of the Volga region near Wolsk in the years 1928 to 1933],” p. 6.

⁴⁹⁶ *Ibid.*, p. 7.

topic that was off limits: “political issues were never raised by either side, and thus peace was always maintained.”⁴⁹⁷

While political discussions were avoided, Tomka did provide the German officers present with a glimpse into early Stalinism. After one round of aviation tests, Commissar Zhigur set up a tent near the testing field. There were large posters there, reading “capitalism has rejected our offer for peaceful exchange, so now we have to prepare for defense; you must search this field for [mustard gas] droplets; he is a poor socialist who exempts himself and does not do his full part of the work.”⁴⁹⁸ The tent had a radio blaring a state program; Communist Party newspapers and books were freely available for the soldiers off duty. The Germans watched the soldiers, after their duty was done, playing chess, drinking tea and eating pastries, singing and dancing. Sicherer noted with disdain that “in short, it was all directed to indoctrinate the off-duty soldiers with the strongest possible Communist state propaganda.”⁴⁹⁹ The Soviets, for their part, carefully monitored the political affiliations of the German officers present, and noted an accelerating drift to the right between the years 1929 and 1933.⁵⁰⁰

⁴⁹⁷ Sicherer, “Tomka: Ein Deutsches Geheim-Unternehmen Hinter dem Eisernen Vorhang in den Steppe des Wolga-Gebietes bei Wolsk in den Jahren 1928 mit 1931, Abbau 1933 [Tomka: A German Secret Operation behind the Iron Curtain in the steppe of the Volga region near Wolsk in the years 1928 to 1933],” p. 5.

⁴⁹⁸ “20. Tätigkeitsbericht über die Zeit von 12.9-18.9.31 [20th Activity Report],” September 9, 1931, RH12/4/55, 196, BA-MA, p. 3.

⁴⁹⁹ “20. Tätigkeitsbericht über die Zeit von 12.9-18.9.31 [20th Activity Report],” p. 4.

⁵⁰⁰ The largest sample size for Soviet intelligence was the flight school at Lipetsk, where several hundred German officers resided. An OGPU officer recorded the political affiliations of every officer present, and reported the increasing support for the National Socialist German Workers’ Party, particularly among junior officers. The local OGPU station also made efforts to “turn” junior officers into Soviet informants, but found sympathy for the Soviet Union declined between 1927 and 1933, particularly as almost no Social Democrats were among the ranks of the officers sent to Lipetsk in 1932 or 1933.

THE TECHNICAL PROGRAM IN 1931

The year 1931 was the apogee of work at Tomka. It is also the year for which the most detailed reports and information survives from both the Soviet and German sides. Breaking down the technical program during that year highlights the annual research cycle begun in 1928 and continued through 1932. It also clarifies the nature of scientific testing at Tomka, how the Soviets and Germans perceived and interacted with one another, and the goals of each side.

With the end of winter testing in December, 1930, almost all of the Reichswehr officers left as the weather went from bad to worse. They returned home to Germany, where most were involved in analysis groups that poured over the data accumulated during the 1930 research season. The Tomka team's leading members also began discussing the work to be done the following year. In February 1931, Niedermayer wrote to Yakov Fishman about the test program for the following year, laying out a number of priorities. Fishman reviewed the list and made some suggestions. Niedermayer in turn completed a final program for the research season on March 1.

This schedule for 1931 included a nine-point testing program: 1) the development of solid-state mustard gas 2) better adhesive agents 3) the development of new calibers of chemical ammunition (*geschosse*) and bombs 4) the development of new fuses and ground attack containers (i.e., gas storage tanks). 5) the completion of trials for a large chemical (ground) sprayer 6) the construction of refilling stations and a smelting station at Tomka or in its environs 7) the beginning of trials with Blue Cross (the respiratory agent diphenylchlorazine, nicknamed "maskbreaker" by the Germans), and Green Cross

(Phosgene and Phosgene-based agents), 8) advancements in the detoxification process, and 9) “the development of medical techniques for the treatment of chemical injuries.”⁵⁰¹

On May 22, a German “forward” team of fifteen officers and enlisted men arrived at Tomka. They reactivated the telephone lines - which had been shut off for the winter - and began working alongside Russian construction crews in updating the facilities. For 1931, these projects including the “excavation of a new animal barracks,” a new electrical generator building, the expansion of the food cellar, and the retrofitting of the fire-fighting water pump.⁵⁰² Three days later, lead chemist Sicherer arrived. Although the majority of the team would not arrive until mid-June, Sicherer decided to initiate the first tests of the season immediately.

Sicherer wanted to begin with *Yellow Cross* testing, the primary testing substance from the 1930 research season. Available in large quantities from *VOKhIMU*, it was a logical first step. In the early morning hours of May 30, officers at the camp noted that it was very warm and that “almost no wind— so the best *Gaswetter* (gas weather).”⁵⁰³ Donning their gas masks and suits, the German team, joined by a number of Russian officers and students, detonated two gas bombs on the “mustard gas field.” But unfortunately, several of the officers had not “closed their suits tightly enough because of the intense heat.”⁵⁰⁴ The result was that “participants suffered mustard gas burns to the

⁵⁰¹ Oskar von Niedermayer, “Perevod Pisem g. Nidermayer [Translation of a letter from Mr. Niedermayer,” 7.2.1931 г. 33988\3\162, l. 34

⁵⁰² Voelcker, “Tätigkeitsbericht über die Zeit vom 18.5.- 25.5.1931 [Activity Report on the Period from May 18 to May 25 1931],” May 25, 1931, RH/12/4/55, 251, BA-MA, p. 1.

⁵⁰³ “9. Tätigkeitsbericht über die Zeit von 29.6 bis 5.7.31 [9. Activity Report],” July 6, 1931, RH12/4/55, 196, BA-MA, pp. 1-5.

⁵⁰⁴ Ibid.

arms and neck, or even almost their whole bodies.”⁵⁰⁵ It might have seemed an inauspicious start to the testing season, but such injuries were par for the course at the facility. Without skipping a beat, the report’s author noted that “similar experiments are envisaged for [June] 7th.”⁵⁰⁶

German commandant Trepper and the Russian Co-Commandant, Zhigur, also arranged to a series of lectures and debates for their staffs for the 1931 research season. During the last week of June, they held the first two of these sessions: one a general introduction to gas warfare for new participants at Tomka, and a second on the use of chemical agents in the artillery.⁵⁰⁷ Sicherer noted that “the questions from the Russian side were very lively and thorough. Questions from us, however, were answered reluctantly and [the Russian speakers] held back.”⁵⁰⁸ Whether this was due to secrecy concerns or lack of trust of their German counterparts was unclear.

Throughout the summer, the artillery grounds resounded with the boom of gunfire. Testing calibers, concentrations and dispersion occurred on a weekly basis from the beginning of the test season through November, including on weekends. There were fifteen guns on the testing grounds: six field cannons, four light howitzers, two heavy howitzers and a few smaller caliber guns.⁵⁰⁹ Experimental work in 1931 included testing

⁵⁰⁵ “9. Tätigkeitsbericht über die Zeit von 29.6 bis 5.7.31 [9. Activity Report],” July 6, 1931, pp. 1-5.

⁵⁰⁶ Ibid.

⁵⁰⁷ Ibid.

⁵⁰⁸ Ibid.

⁵⁰⁹ “Nachrichten über r. Anschauungen, Versuche in chemischer Kriegsführung und Zusammenarbeiten mit uns [News about ideas, research in chemical warfare and cooperation with us],” September 5, 1931, pp. 1-4.

new calibers of chemical ordinance, different concentrations of Yellow, Green and Blue Cross, as well as different types of explosive charges.⁵¹⁰

Simultaneously, work proceeded with sprayer and aviation technology. Early in the morning on August 9, Tomka witnessed a strange sight: a six-wheeled armored vehicle with a spraying hose driving past camp to a testing field. This was a Krupp armored car which had been specially designed as an off-road chemical tank.⁵¹¹ The goal was to test concentrations of chemical agents along different type of roadways: dirt, concrete, stone, etc. The experiment aimed to test the possibilities of rendering roads impassable to enemy vehicles by the use of a chemical truck or tank.⁵¹² The mixture they used had identical chemical consistency to the “solid-state” mustard gas used in earlier tests. Distribution left “chunks from [the size of] beans to the size of a fist on the ground.”⁵¹³ This meant satisfactory distribution; the road would become impassable for at least an hour after spraying. Dr. Grundherr’s team also worked on simplifying the design so that the sprayer “can be mounted on any commercial trucks.”⁵¹⁴

Aviation testing, the most important research work at Tomka, proceeded all summer. Russian reports described the sort of testing that was conducted at Tomka. Supervised by the camp biologist, dogs and rabbits were left caged at premeasured

⁵¹⁰ “24. Tätigkeitsbericht über die Zeit von 10.-16.10.31 [24th Activity Report of the life of 10th-16:10:31],” October 17, 1931, RH12/4/55, 178, BA-MA, pp. 1-6.

⁵¹¹ Ibid p. 3.

⁵¹² Grundherr, “Bericht Erdreferat To. 1931 [Report: Soil Unit To[msk] 1931,” August 17, 1931, RH/12/4/55/221-223, BA-MA, pp. 1-13, p. 10.

⁵¹³ Ibid.

⁵¹⁴ Ibid, p. 6.

distances around the chemical testing ground.⁵¹⁵ A Russian (or occasionally German) pilot, flying one of Tomka's four test aircraft, released a bomb payload at a pre-determined height. Most of these bombs were small, weighing around eight kilograms. Each had a glycerine charge and a small gas payload. Dropped (with varying degrees of accuracy) over the field from a variety of heights, the bombs, each containing a timed fuse, exploded a distance off the ground, dispersing a chemical agent over an area ranging up to several hundred square meters. After a short wait, the team's scientists would visit the field to measure the damage inflicted on the test animals. Traditional dispersion – by gas canisters placed on the ground – was found to kill around 83 percent of all test animals and render the remainder incapacitated.⁵¹⁶ But aerial sprayers and bombs tested at Tomka proved less effective, fatal in only about 50 percent of all cases.⁵¹⁷ The issue was that gas dropped from the air dispersed too quickly or reacted with the explosive charge, rendering the damage less than desired.

For low-altitude tests, real mustard gas was frequently utilized. But for high altitude tests, the Tomka researchers used non-toxic chemical compounds with similar properties to test dispersion and concentration; the reason for this was to avoid casualties should the aircraft miss the test field. On September 12, a Russian pilot took up one of these non-toxic test loads. He released 25 kilogram bombs full of the material on Tomka's *polygon* from heights varying between 20 meters and 3000 meters.⁵¹⁸ Both

⁵¹⁵ Yakov Fishman, "Ispitanii 8-mm kg. Khim. Aerobombi [Testing of the 8 Kilogram Chemical Aerobomb]," 27.7.1928, 33988/ 3c/98 (22), 152 (RGVA), pp. 1-8.

⁵¹⁶ Fishman, "Ispitanii 8-mm kg. Khim. Aerobombi [Testing of the 8 Kilogram Chemical Aerobomb]."

⁵¹⁷ "20. Tätigkeitsbericht über die Zeit von 12.9-18.9.31 [20th Activity Report]," September 19, 1931, RH12/4/55, 196, BA-MA, p. 1.

⁵¹⁸ Ibid, p. 1.

Soviet and German teams looked on. They noted with satisfaction that the low altitude tests coated the polygon very effectively.⁵¹⁹ They followed this test up with a high-altitude bombing run, intended to test the possibility of inflicting “the very greatest [damage] in the hinterland.”⁵²⁰ But from the height of 3000 meters, “we scoured the 1.5 kilometer square bombing target field and did not find the chemical agent – this only confirmed our [earlier] experiences.”⁵²¹ The chemical agents dispersed too fast to have any noticeable effect on ground level.

Trepper wrote that this confirmed what the German team had learned over the previous few years: strategic bombing with chemical weapons was deeply problematic: better fuses, more bombs effective bombs and more “solid” chemical agents would be needed to render bombing from 3,000 meters against targets like cities.⁵²² Zhigur seemed disappointed, but noted that the Soviets

still laid great value on this type of attack to compromise the largest possible area of enemy territory behind the front. He added, wholly in jest but with an inscrutable face, that it [the low level flights] would still be sufficient to give an enemy, for example Polish soldiers, and indeed [Poland’s] workers and peasants, a lesson from which they could recover after a few weeks.⁵²³

⁵¹⁹ “20. Tätigkeitsbericht über die Zeit von 12.9-18.9.31 [20th Activity Report],” September 19, 1931, p. 1.

⁵²⁰ “Nachrichten über r. Anschauungen, Versuche in chemischer Kriegsführung und Zusammenarbeiten mit uns [News about ideas, research in chemical warfare and cooperation with us],” September 5, 1931, p. 3.

⁵²¹ Trepper used “we” here in the loosest sense. He actually watched while fifty Red Army enlisted men searched the field. “20. Tätigkeitsbericht über die Zeit von 12.9-18.9.31 [20th Activity Report],” September 19, 1931, p. 1.

⁵²² Ibid. This rendered the arguments made by Douhet (and other strategic bombing advocates) problematic. The Soviets, however, had greater confidence in technological progress on the issue of chemical weapon deployment than the Germans.

⁵²³ “20. Tätigkeitsbericht über die Zeit von 12.9-18.9.31 [20th Activity Report],” September 19, 1931, p. 2.

The German side, for its part, was inclined to believe that strategic bombing with chemical weapons was unproductive; the tactical use of chemical weapons seemed more promising with existing technology.⁵²⁴

This aviation testing had its costs: Trepper recorded that the Russians had “allegedly lost seven people due to the premature opening of a chemical container...”⁵²⁵ The Germans only learned of the incident, which was conducted by the Soviet side alone at TsVHP, when Zhigur urgently appealed to Trepper for medical equipment and decontamination materials for their injured men. The Germans asked whether or not their doctors could be of use; they had the dual motive of hoping to see the men themselves, as Trepper wrote that “this case would have been for our physicians of the highest interest.”⁵²⁶ But the Soviets rejected the offer for direct medical help, limiting their request to medical equipment.

Tests also proceeded throughout the year on chemical defense and medical treatment for chemical injuries. This involved using different bleaches and medical treatments to repair chemical burns inflicted by mustard gas. The best way to test new techniques was on human volunteers. Lev Fyodorov, a Russian chemist, stated in an interview that “Soldiers would be locked in a bunker with respiratory gear and gassed. Or gassed without wearing any equipment at all. Sometimes soldiers would stand at a

⁵²⁴ “20. Tätigkeitsbericht über die Zeit von 12.9-18.9.31 [20th Activity Report],” September 19, 1931, p. 2.

⁵²⁵ “Nachrichten über r. Anschauungen, Versuche in chemischer Kriegsführung und Zusammenarbeiten mit uns [News about ideas, research in chemical warfare and cooperation with us],” September 5, 1931, pp. 2-3.

⁵²⁶ *Ibid.*, p. 2.

certain distance from a release point, while officers measured the effect of their reaction. ‘This was standard procedure in the Red Army.’⁵²⁷

Another anecdote also highlights this sort of testing. In a rare interview, Eduard Vilyatitsky, a former chemical battalion soldier recounted his experience at Podosinki after World War II.⁵²⁸ Vilyatitsky recalled that degassing techniques were tested in the most primitive ways imaginable. Soviet chemists would douse a uniform in mustard gas, try out a new method of decontamination on the uniform, and then force a Soviet enlisted man to put the uniform on.⁵²⁹ In other instances, drops of mustard gas were applied directly to the skin of Soviet soldiers: “four drops of Braley Mustard Gas was applied on your hand, then it was degassed... And we looked – here, then a little redness appeared, because it’s still bad, [the degasser] does not immediately react away all of it...”⁵³⁰ This sort of human testing sometimes proceeded on a huge scale. In October 1931, Zhigur told Trepper that the Soviet side had decided to run a battalion-size test of a new gas mask and gas protection system which could filter smaller particles than in the past. This had involved forcing a gas battalion to march through mustard gas, with only the first row of soldiers wearing full protective gear. The German replied, in surprise, that the Soviet side “placed quite extraordinary demands on the gas discipline of their troops...” Zhigur answered that “gas discipline is now among the most important of requirements, and that

⁵²⁷ In this interview, he was talking specifically about the work done at Podosinki, before Tomka was built. But similar work was conducted at Tomka as well. Marina Katys, “The Military Chemical Landfill - Moscow,” Radio Liberty, 20.12.2000, Freedom Archives, <http://www.svoboda.org/content/transcript/24197763.html>

⁵²⁸ Ibid,

⁵²⁹ Ibid.

⁵³⁰ Ibid.

they prefer to suffer some losses than let this opportunity to test many warfare agents pass by...”⁵³¹ The price of advancing the technology of chemical warfare was high in human terms.

While Trepper reacted with surprise to the Soviet methods, the Germans, for their part, also depended on human testing, though usually on volunteers from their own ranks.⁵³² When testing decontamination methods or new gas masks at Tomka, the Germans turned to their “experimental unit” which had to endure being gassed to test the efficiency of the new technologies.⁵³³ In 1931, for instance, a new decontaminant drawn from “veterinary medicine, Sulfoliquid, was tested on six volunteers to compare it with the old ways of treatment.”⁵³⁴ This involved placing mustard gas on the skin of German volunteers, waiting for the beginnings of a reaction and then applying the decontaminating agent. After noting some of the injuries endured – “severe skin burns, eye conjunctivitis, pharyngeal and laryngeal catarrh...” – Trepper praised “the personal courage and devotion of my staff.”⁵³⁵

At the beginning of October, a new chemical weapon arrived at Tomka for testing. Fishman and VOKhIMU had, for years, insisted that the Germans must be hiding their research in Germany, as no new chemical agents had been deployed at Tomka. As the Germans noted, “the most important question for the R.A. [Rote Armee] are new

⁵³¹ “Nachrichten über r. Anschauungen, Versuche in chemischer Kriegsführung und Zusammenarbeiten mit uns [News about ideas, research in chemical warfare and cooperation with us],” September 5, 1931, p. 2

⁵³² Ibid, p. 11.

⁵³³ Ibid, p. 11.

⁵³⁴ “Pri Sem Prilagaetsya Doklad o Rezultakh Raboti Tomka, Priedannii Nemtsami Soglasno Prosvi T. Uborevicha [Attached herewith a progress report on Tomka, affiliated Germans as requested T. Uborevicha],” March 15, 1931, Yale (Originally RGVA), 33888/3/205/375, p. 11.

⁵³⁵ Ibid.

agents.”⁵³⁶ The Reichswehr CW university research teams had concluded, after testing more than 10,000 chemical compounds, that the discovery of new, cheap and effective CW agents was unlikely.⁵³⁷ But, in part to accommodate the Russians, the Germans announced they were bringing a new chemical agent to Tomka for testing, codenamed “Pffifkus.” Strictly speaking, it was not a new agent, but a mixture of well known CW compounds. Nonetheless, great fanfare attended the first of these tests, begun on October 8, 1931.⁵³⁸ “Pffifkus” was a chlorine-arsenic mixture which was intended to combine the effects of Blue Cross, Yellow Cross and Green Cross into a single superweapon.⁵³⁹ This agent was intended to trigger both skin blistering and lung poisoning, as well as have the advantages of Blue Cross, which was the least easily detected and filtered chemical agent. Tests proceeded throughout October on the artillery range with grenades and aerial bombs.⁵⁴⁰ Dr. Wirth, who performed autopsies on the test animals, reported that “51 percent of the animals died during the cycle time. 42 percent of the animals were affected more or less intensely and 7 percent of animals survived without specific findings.”⁵⁴¹ Most of the affected animals died over the following weeks. Despite this “success,” the

⁵³⁶ “Sitzung über To.-Programm am 17.10.32 [Meeting on the To.Programm on October 17, 1932],“ October 17, 1932, RH12-1/54/36-38, BA-MA, pp. 1-3, p. 2

⁵³⁷ Zeidler, p. 202.

⁵³⁸ “Pri Sem Prilagaetsya Doklad o Rezultakh Raboti Tomka, Priedannii Nemtsami Soglasno Prosvi T. Uborevicha [Attached herewith a progress report on Tomka, affiliated Germans as requested T. Uborevicha],” March 15, 1931, Yale (Originally RGVA), 33888/3/205/375, p. 11.

⁵³⁹ Zeidler, 202.

⁵⁴⁰ Wirth, “Perstoff-Schiessen vom 14.X.1931 [Perstoff Shooting from October 14.1931. ” October 10, 1931, RH12/4/55, 128, BA-MA, p. 9.

⁵⁴¹ Ibid.

chemist Sicherer noted that Pfiffikus had a habit of evaporating or mixing with water vapor and becoming harmless.⁵⁴²

The testing of the new CW agent brought with it rumors of a high level visit to Tomka. On October 11, Trepper recorded that he had heard Marshal Tukhachevsky might visit Tomka in person. The Germans regarded him as one of the most brilliant military theoreticians alive; during a visit to Germany earlier that year, Tukhachevsky had received a rockstar's welcome.⁵⁴³ Zhigur and Grundherr laid out an agenda for their visitor which would involve "a walkthrough of all the laboratories together, with presentations by lecturers" and viewing of a bombing and shooting test.⁵⁴⁴ Trepper did hasten to complain to his superiors that "our work was thus severely disrupted" by preparations for the visit.⁵⁴⁵

Both Germans and Russians must have been disappointed when instead of Mikhail Tukhachevsky, his subordinate in the Ordinance Department, General Efimov, arrived on the night of October 11. Efimov, who had also visited Tomka the year before, spent his first night at Tomka enjoying a large dinner party with fifteen German guests and a number of Russian officers. Trepper noted that "the party was as great as if it had

⁵⁴² Sicherer, "Bericht über das 6 Artl. Schiessen am 13 u 14.10 31 – Perstoff-Schiessen [Report on the 6 Artl. Shootout at 13 and 14.10 31 - Perstoff-Shootout]" November 5, 1931, RH12/4/55, 124, BA-MA, pp. 1-3

⁵⁴³ "Bericht Erdreferat To. 1931 [Report: Soil Unit To[msk] 1931," August 17, 1931, RH/12/4/55/221-223, BA-MA, pp. 1-13, p. 6

⁵⁴⁴ "15. Tätigkeitsbericht über die Zeit von 10-16.8.31 [15th Activity Report for the Period from 10-16.8.31]," p. 1.

⁵⁴⁵ Ibid.

been an official dinner at a top hotel in Moscow.”⁵⁴⁶ He added in his official report that “it brought the German and Russian staff a lot closer.”⁵⁴⁷

The demonstrations planned for Efimov proved less successful than the dinner. Dr. Voelcker, the head of the chemical aviation bomb unit, had a severe attack of angina that left him bedridden until October 17. But the laboratory tour and chemical bullet demonstration went off as planned; Efimov apparently was well informed of the work going on at Tomka, leading Trepper to comment gratefully, “I believe Mr. Efimov gained a favorable impression of our work from the reports of Mr. Schigur [Zhigur].”⁵⁴⁸ On the night of October 13, Efimov travelled back to Moscow in his own private train car.⁵⁴⁹

After Efimov’s departure, Tomka resumed its earlier rhythm, with testing continuing into November. As the weather turned cold and cloudy, aviation tests declined. Instead, work continued successfully on the duration of chemical potency – areas would be sprayed with variants of mustard gas and tested to see how long the substance remained dangerous.⁵⁵⁰

But overall, “success in winter proved quite difficult.” By mid-November, work became impossible: “On November 18, winter arrived with...snow drifts meters high and

⁵⁴⁶ He also added a note of disdain regarding the Soviets serving at Tomka: “The conduct of the Russian cadres with Mr Efimov off duty, e.g. at the social evening was extremely proper; also with Mr Schigur they were constantly observing good mil[itary] proprieties. [They] tend to be so sloppy off-duty in attitude and dress [that] the visit is an opportunity to see great discipline and sharp drill.” (“15. Tätigkeitsbericht über die Zeit von 10-16.8.31 [15th Activity Report for the Period from 10-16.8.31],” pp. 2-3)

⁵⁴⁷ Ibid, pp. 2-3.

⁵⁴⁸ “15. Tätigkeitsbericht über die Zeit von 10-16.8.31 [15th Activity Report for the Period 10-16.8.31],” p. 1.

⁵⁴⁹ Ibid.

⁵⁵⁰ “Pri Sem Prilagaetsya Doklad o Rezultakh Raboti Tomka, Priedannii Nemtsami Soglasno Prosbi T. Uborevicha [Attached herewith a progress report on Tomka, affiliated Germans as requested T. Uborevicha],” p. 1.

grim cold – for days and weeks there was no way to use cars.”⁵⁵¹ Winter testing proved impossible until a break in the weather in mid-December. The German team was forced to resort to wooden carriages and sleighs just to move around the camp. With work at a minimum, “only snowshoeing and the occasional celebration, e.g. Christmas and New Year’s Eve, kept up the spirits of each individual.”⁵⁵² As long nights and deep snowfalls hemmed Tomka in, the German staff began to depart.

THE CLOSING OF TOMKA

With the exodus of the German team, Tomka closed for the season. It would not reopen. After extensive discussions between Fishman, Fischer, Janis Bersin of the GRU and other senior officers, it was decided not to resume testing at the facility in the 1932 season.⁵⁵³ There were a number of reasons for this. First, the Soviet priority was not tactical testing: by 1932, they were conducting large-scale field tests themselves at other facilities. Their production facilities, with German help, were becoming productive on a vast scale; VOKhIMU could report in at the end of 1930 that it could fill five million artillery shells of 12 different calibers with chemical agents; its factories were producing 300,000 gas masks a year, and the organization had five full-strength chemical battalions staffed with well-trained personnel.⁵⁵⁴ Fishman’s interest was no longer in the sort of work being performed at Tomka. He wanted to develop new chemical agents and gain

⁵⁵¹ Fishman, “V Osnovnom Soglasen, Uborevitchu [A Summary of the Agreement, to Uborevich],” December 30, 1930, pp. 13-14.

⁵⁵² Ibid, p. 14.

⁵⁵³ Ibid.

⁵⁵⁴ Ibid.

access to German laboratory facilities. Difficulties between the Germans and Soviets over the 1932 program had not been resolved by late spring.

The Germans, for their part, worried about the expense of maintaining Tomka. They proposed to suspend testing in 1932 and then resume it in 1933. At a meeting with the *Chef des Truppenamts* General Wilhelm Adam in May 1932, the Reichswehr officially decided to suspend their work: “for a year, we will willingly interrupt the experiments at Tomka, and plan to use the resulting break for further improvement and development. It is then possible to save significant funds this year, which can also be used to benefit [us] the next year.”⁵⁵⁵

Despite this decision, a German team was dispatched to check on the state of the facility and prepare it for the 1933 testing season. A team of six Reichswehr men arrived on October 5, 1932 to oversee storage and general repairs.⁵⁵⁶ Among them were Thoms and Pfitzner, the two mechanics who had spent the winter at Podosinki in 1927. Thoms fell ill with the flu on the day the team was supposed to depart, so he and Pfitzner remained at Tomka with some Russian staff for three days, then departed for Moscow.⁵⁵⁷ The two men had witnessed all seven years of direct CW cooperation between the two sides. They had been in the first team to arrive at Podosinki in 1926, and were the last two Germans to depart Tomka in 1932.⁵⁵⁸

⁵⁵⁵ “Ergebnis der Besprechung bei Chef T.A. am 25.4.32 als Beitrag zum Schreiben an Z.M. [Outcome of the meeting with the Chief T. A. on 4/25/32 as a contribution to write to Z.M],” May 25, 1932, RH/12/4/54/15-, BA-MA, pp. 1-3

⁵⁵⁶ “Bericht über das To.Kdo. vom 5/10-9/11.1932. [Report on the To.Kdo. from 5/10-9/11, 1932],” November 11, 1932, RH12/1/54, 129-134, BA-MA, p. 1.

⁵⁵⁷ Ibid, p. 2.

⁵⁵⁸ “Stellungnahme zu den ru. Forderungen To. [Opinion on the Russian demands for To.],” 1933, RH12/1/54, 39-41, BA-MA, pp. 1-3.

1932 did not signal the end of scientific and technical CW collaboration between the two sides. Even with the closure of Tomka, cooperation continued in other veins more amenable to both the Germans and the Soviets. For instance, Fishman proposed the construction of a joint laboratory in Germany. Although the Germans demurred, they did invite two Soviet scientists to Dr. Wirth's lab in Berlin in the fall of 1932.⁵⁵⁹ Fishman also arranged a chemical warfare conference in Moscow in December, to which Tomka alumni Wieland, Meyer, Wirth and Reichswehr affiliate Ferdinand Flury were all invited.⁵⁶⁰ Perhaps most significantly, the Reichswehr requested and received permission from the Soviets to run three weeks of joint aero-chemical testing at Lipetsk, the jointly-run flight school.⁵⁶¹

The following year, however, cooperative CW work came to an end. After Hitler's seizure of power on January 30, 1933, it was clear that the relationship between the Reichswehr and the Red Army would change. German documents indicate that they intended to resume testing at Tomka in the summer of 1933.⁵⁶² However, testing could now be resumed within Germany due to the tacit abrogation of Versailles that accompanied Hitler's assumption of power. During a visit to Moscow during the summer of 1933, General von Bockelberg decommitted from testing. As a German report recorded, "it was immediately clear what was going on: the interests of [the two sides]

⁵⁵⁹ "Ergebnis der Besprechung bei Chef T.A. am 25.4.32 als Beitrag zum Schreiben an Z.M. [Outcome of the meeting with the Chief T. A. on 4/25/32 as a contribution to write to Z.M]," May 25, 1932, RH/12/4/54/15-, BA-MA, pp. 1-3; p. 2.

⁵⁶⁰ "Protokoll über die Sitzung am 16.10.32 über das To.-Programm, [Minutes of the meeting on October 16, 1932 on the Tomka Program," October 16, 1932, RH 12/4/54, 1, BA-MA, pp. 5.

⁵⁶¹ "Abschrift aus Z.B. Bericht v. 31.5.32," May 31, 1932, RH/12/4/54, 24, BA-MA, 1

⁵⁶² "Gesamtbild der Abwicklung der Station To. 1933, [Overall picture of the Termination of the station To. 1933]," August 22, 1933, RH/12/4/55/55-, BA-MA, p. 1.

conflicted with each other.” Instead of continued chemical work, Bockelberg proposed a team of six men go to Tomka to collect and return equipment there to Germany, which the Soviets approved.

The trip was not a pleasant one: Zhigur had been replaced by a General Gubanov, who proved much less friendly to the small German team. They complained that he even denied them permission to leave the camp enclosure to bathe in the river when the temperature reached 104 degrees. Gubanov also intentionally impeded their work, trying to prevent the removal of any equipment to Germany when he could, particularly German manufactured testing equipment and the camp’s vehicles.⁵⁶³ While the Germans returned with the majority of their vehicles, they were forced to leave 275,000 RM worth of valuable laboratory equipment at the Tomka grounds.⁵⁶⁴

The German team had a dual mission. Besides seeking the return of their equipment, they were instructed to record everything they saw at the base, as well as the general state of affairs in the region. On the military side, they recorded that the Soviets were actively expanding their facilities at Tomka. By the time of their visit, the Red Army had their own aircraft present, new testing vehicles, a rail line directly to the station and other new facilities.⁵⁶⁵ On the political side, they noted with horror was that the region was gripped by famine in 1932 and 1933. The German team reported that “in the Volga Colony, people are dying of malnutrition: mainly children, the old and the sick; in

⁵⁶³ “Gesamtbild der Abwicklung der Station To. 1933, [Overall picture of the Termination of the station To. 1933],” August 22, 1933, p. 16.

⁵⁶⁴ Ibid, p. 7.

⁵⁶⁵ Ibid, p. 8.

the market town, 60 to 70 people are dying daily from starvation.”⁵⁶⁶ Below that observation, the German author dutifully recorded the prices of food at their hotel, well out of the reach of even skilled laborers. This last German team returned to Germany in the early fall, 1933, officially concluding CW cooperation with the Soviet Union.

CONCLUSION

Tomka played a central role in the interwar Reichswehr’s CW program. From 1928 to 1931, it was essentially the headquarters of the program, as it hosted the program’s official head (Trepper) and several of the program’s top scientists. It was to Tomka that new discoveries in Germany – like Pfiffikus or Germany’s chemical tank prototypes – were first sent for testing. Chemist Leopold von Sicherer recorded much later that “the value of this operation [Tomka] was of the first order, in the testing of CW agents, and in the process, the lessons learned in the training of the experimenting specialists...the Tomka Operation laid the foundation for latter experimentation on German soil.”⁵⁶⁷ The core of Fritz Haber’s World War I-era program was preserved by moving the most sensitive testing to the Soviet Union, and maintaining a decentralized network of corporate and academic partners at home. When the Reichswehr began expansion, this CW network was reabsorbed after 1933. Officers like Sicherer, Grundherr, Wirth and Flury would all join the Wehrmacht or SS.

⁵⁶⁶ “Gesamtbild der Abwicklung der Station To. 1933, [Overall picture of the Termination of the station To. 1933],” August 22, 1933, p. 3.

⁵⁶⁷ “Tomka: Ein Deutsches Geheim-Unternehmen Hinter dem Eisernen Vorhang in den Steppe des Wolga-Gebietes bei Wolsk in den Jahren 1928 mit 1931, Abbau 1933 [Tomka: A German Secret Operation behind the Iron Curtain in the steppe of the Volga region near Wolsk in the years 1928 to 1933],” p. 12.

While Tomka played an important role for the Germans, the Soviets were undoubtedly the winners of CW collaboration. Yakov Fishman had few resources and little political clout in 1925 when he became the head of VOKhIMU. It was testing alongside the Germans that convinced his superiors of the value of CW research. By 1933, VOKhIMU had a vast network of production and testing facilities and access to the world's most up-to-date CW agents and deployment techniques. It was due to this extensive cooperation that, more than any other part of the Soviet military, the early Soviet chemical weapons program followed German developments and was organized most nearly along German lines. The end result, as Sergei Gorlov put it, was that

in less than 10 years, the Red Army was able to create their own CW program, organize research and testing, establish production facilities for chemical attack and defense, and thus stand in the area of chemical warfare on a par with the armies of the world's leading powers.⁵⁶⁸

By 1941, German intelligence estimated that the Soviet Union was capable of producing 100,000 metric tons of mustard gas a year, and 12,000 metric tons of Lewisite, a chlorine-arsenic blend.⁵⁶⁹ Those sums exceeded the total tonnage of all chemical warfare agents produced by Great Britain, France, Italy, the United States and the Russian Empire combined during the First World War, and represented the world's largest production capacities.⁵⁷⁰

Of course, the question must be asked: how much did this military cooperation matter, given that chemical weapons were not deployed in the Second World War? In

⁵⁶⁸ Gorlov, p. 230.

⁵⁶⁹ Lev Aleksandrovich Fedorov, p. 8.

⁵⁷⁰ A.M. Prentiss, *Chemicals in War. A Treatise on Chemical Warfare*, McGraw Hill: New York, 1937; cited by Martinetz, p. 120.

retrospect, cooperation may have played a significant role in the non-use of CW. Much has been made of Hitler's decision not to deploy chemical weapons; the argument is usually advanced that his own experience with gas in the First World War turned him against the use of CW on the battlefield. But the interwar German military had already effectively rejected the use of CW in combat. None of the major operational theorists of the German army integrated CW into their ideas after 1933. The Germans even went so far as to ignore incidents on the Eastern Front where CW agents were deployed on a very small scale.⁵⁷¹ The German military dismissed the offensive use of chemical warfare based on the practical experiences of the interwar period. As Krause and Mallory noted, "the Germans saw chemical weapons as a menace to their concept of mechanized warfare."⁵⁷² The vision of German military theorists – "the restoration of the primacy of both the maneuver and the offensive in battle" – required a degree of precision that advances in CW deployment technology failed to provide.⁵⁷³

There were three fundamental problems that Soviet-German testing failed to solve. First, the protection of armored vehicles and their occupants against gas was never resolved without creating other technical problems.⁵⁷⁴ Testing revealed that the insulation required to render a vehicle's crew safe from CW was very heavy and created engine problems. Some experiments were done with having tank crews wear insulated suits, but this proved nearly impossible in the cramped quarters of an armored vehicle. Thus, CW could significantly impact the mobility and effectiveness of armored formations. Second,

⁵⁷¹ Krause, Mallory, p. 75.

⁵⁷² Ibid, p. 74.

⁵⁷³ Ibid, p. 76.

⁵⁷⁴ Ibid, pp. 75-76.

chemical weapons were never adequately adapted to modern aviation technology. The inability of German and Soviet technicians to develop aero-chemical bombs or sprayers meant that the use of chemical weapons in conjunction with strategic airpower was infeasible. By 1933, it was apparent that artillery remained the best deployment system for CW, and that with changes in combat technology, this suited defensive rather than offensive warfare. Finally, CW deployment remained fundamentally dependent on the weather. As extensive testing at Podosinki and Tomka proved, even with advances in deployment techniques, chemicals were imprecise agents at best. Their utility depended on temperature, humidity, rainfall and wind. This, too, handicapped the usefulness of CW in conjunction with offensive operations.

There was another factor at work in the German decision not to use chemical agents in World War II. In 1915, the German military had used CW because they knew they possessed a vast qualitative and quantitative advantage in the field of chemistry: a nearly 90 percent global market share in those fields of chemistry that easily converted to chemical weaponry.⁵⁷⁵ That was no longer the case in 1933. While the strength of British and French programs might be unknown to the Germans in 1939, they knew that the Soviet Union possessed a CW program on a vast scale. In addition, the German High Command would have been keenly aware, from its experiences with the RKKA from 1928 to 1931 that the Soviets were capable of using chemical aviation on a massive scale against German cities, if they were willing to lose huge numbers of aircraft in the

⁵⁷⁵ Krause, Mallory, pp. 36-38.

process.⁵⁷⁶ They also would have been conscious that Germany's far higher population density and large, concentrated cities made the targeting of civilian populations in Germany far more dangerous than such warfare would have been in the vast spaces of the Soviet Union. It made no sense to use such weapons when Germany possessed no material advantage, and indeed, might suffer more than its enemy from their use. In contrast, the Japanese, faced with an adversary in China that did not have CW capacities, felt free to deploy them with no threat of retaliation.⁵⁷⁷ The Italian military followed much the same logic in Ethiopia. The announcement by the western Allies that they would retaliate in kind if Germany deployed CW against the Soviet Union was a final factor against the German use of CW on the Eastern Front.⁵⁷⁸

What of the Soviet Union? Why did the Red Army not deploy their vast chemical weapons arsenal during the darkest days of 1941? That is a harder question to answer. Soviet theorists between 1930 and 1935 extensively discussed and considered the offensive use of CW. Arguments in favor of offensive use of CW were aided in part by the development of an effective aviation sprayer that used Hydrogen Cyanide.⁵⁷⁹ Soviet theorists explored the possibilities of gas warfare in conjunction with tanks, aircraft and massed artillery formations.⁵⁸⁰ But the 1936 Provisional Field Regulations for the Red

⁵⁷⁶ Effective chemical bombing required low-level bombing runs, as testing at Tomka had indicated. Nevertheless, the Soviets had made clear their enthusiasm for strategic CW bombing throughout the period of cooperation. Again, it seems that this was dependent in part on expectations regarding the pace of technological change.

⁵⁷⁷ Ed Croddy, James Wirtz, *Weapons of Mass Destruction: Chemical and Biological Weapons* (Santa Barbara, CA: ABC-CLIO, 2005), pp. 259-262.

⁵⁷⁸ Harris and Paxman, p. 252; Krause and Mallory, p. 95.

⁵⁷⁹ Krause and Mallory, p. 99-100. Hydrogen Cyanide was also known as Zyklon B in Germany. It was one of the primary chemical agents used to kill millions of Jews and others in the gas chambers during the Holocaust.

⁵⁸⁰ *Ibid.*, pp. 76-77.

Army, which placed heavy emphasis on CW, leaned towards the defensive use of CW for many of the reasons German theorists dismissed CW altogether.⁵⁸¹ Yet unlike their German counterparts, Soviet strategists believed that “chemical weapons use in a future war was almost inevitable.”⁵⁸² They therefore much more heavily emphasized their use than did the Germans. Yet Soviet doctrine rested on the fundamental principle of “no first use,” deploying CW only after the enemy had done so first.

While the Soviets had made great strides towards parity with the German CW program, they did not possess Tabun or Sarin, or as high a potential production threshold. Further, the purges of 1937-1938 decapitated VOKhIMU as much as the rest of the Red Army, but CW specialists proved even harder to replace than other experts. By 1941, the Soviet CW defensive stockpiles of gasmasks were in chaos; the inability of the Soviet High Command to supply defensive materiel to their soldiers played a role in the decision against first use of chemical weapons. To date, no material has been discovered indicating that the Soviets ever considered using chemical agents in the great defensive battles of 1941.⁵⁸³

Technical testing at Podosinki and Tomka helped to undermine the notion that new technologies would make CW adaptable to mobile operations. The vast scale of German assistance to the Soviet chemical weapons program meant that the two states entered the Second World War with capabilities much closer to parity than had existed in the First World War. The nature of cooperation in the interwar period had also provided

⁵⁸¹ See “Provisional Field Regulations for the Red Army, 1936,” *USSR Report, Foreign Broadcast Information Service*.

⁵⁸² Krause, Mallory, p. 86.

⁵⁸³ Krause, Mallory, pp. 93-94.

the German and Soviet militaries with a glimpse of each other's technical capabilities, cooling enthusiasm for CW use against one another. Soviet-German military cooperation may thus have played a part in the mental calculus that prevented the deployment of CW in Europe during World War II. It seems the lessons learned at Tomka and fears of mutually assured suffering saved the world from even greater suffering from 1939 to 1945.

CHAPTER FOUR – THE SECRET SCHOOL OF WAR: THE SOVIET-GERMAN
ARMORED WARFARE FACILITY AT KAMA, 1926-1933

INTRODUCTION

On March 2, 1942, Major Klaus Müller, aged 39, stood in the turret of his command tank.¹ Snow covered the hilly ground in front of him, broken up by small frozen lakes and narrow ravines.² Behind him lay the Samara River. In the distance, towards the Ukrainian village of Osadche, the cacophony of combat erupted. Armored elements of the Second Soviet Cavalry Corps were driving southeastward along the Dobrinka-Osadche road, launching a ferocious counterattack into the flank of the Wehrmacht's 1st Mountain Division.³ Müller, the commander of the 60th Panzer Battalion, was stationed nearby at Dobrinka.

On his own initiative, Major Müller led his battalion towards a hill just east of the town of Osadche.⁴ As the German Panzers climbed up some 500 feet of elevation, they encountered enemy infantry near the hill's summit. A firefight broke out, and Soviet

¹ "Vorschlagsliste Nr. 6 für die Verleihung des Ritterkreuzes des Eisernen Kreuzes, 1. Gebirgs-Division Div.Gef.St. [Proposed List #6 for the Award of the Knight's Cross of the Iron Cross, 1st Mountain Division Staff]," March 9, 1942, R 242, A 3356, 580, Collection of Foreign Records Seized, National Archives and Records Administration, College Park, MD (NARA), p. 3.

² The terrain is described in the Knight's Cross Proposal. And according to the British Metropolitan Weather Office, the temperature on March 3, 1942 was approximately 28 degrees in the area southeast of Kharkiv with some snowfall. <http://datamarket.com/data/set/1loo/average-monthly-temperatures-across-the-world#!ds=1loo!1n6s=2qb.2qi&display=line>

³ "Vorschlagsliste Nr. 6 für die Verleihung des Ritterkreuzes des Eisernen Kreuzes [Proposed List #6 for the Award of the Knight's Cross of the Iron Cross]," p. 3.

⁴ *Ibid.*, p. 4.

armored vehicles soon arrived in support. Müller's men set the first four Russian tanks to reach the hilltop ablaze.⁵ Without armored support, Soviet infantry began a fighting retreat into a ravine just south of the Dobrinka-Osadche road. Müller's men pinned them down there, and then supported an attack launched against the Soviet infantry by German soldiers of the 99th Mountain Regiment.⁶ The assault apparently killed the surviving Soviet soldiers.⁷

To the west of his position, a larger battle raged over Osadche. Müller turned his unit northwest and ordered them down towards the outskirts of the village. There, the 60th Panzer Battalion encountered artillery fire and more Soviet tanks.⁸ Müller commanded his battalion into an attack against Soviet armored forces. He then engaged the enemy directly; his own panzer opened fire at close quarters against Soviet armored forces defending the edge of the village.⁹ The Red Army soldiers fought tenaciously, inflicting heavy losses against accompanying German infantry.¹⁰ But faced with Müller's tanks, the elements of the 2nd Soviet Cavalry Corps found themselves outgunned and began a fighting withdrawal northwards. They left nine Soviet tanks burning around the edges of

⁵ "Vorschlagsliste Nr. 6 für die Verleihung des Ritterkreuzes des Eisernen Kreuzes [Proposed List #6 for the Award of the Knight's Cross of the Iron Cross]," p. 4.

⁶ Ibid.

⁷ The citation makes no reference to Soviet prisoners, only dead. Given that prisoner counts are often mentioned in Knight's Cross citations, this seems to suggest that the Soviets in the ravine near Osadche fought to the death.

⁸ "Vorschlagsliste Nr. 6 für die Verleihung des Ritterkreuzes des Eisernen Kreuzes [Proposed List #6 for the Award of the Knight's Cross of the Iron Cross]," p. 4.

⁹ Ibid.

¹⁰ Ibid. More than 70 German infantrymen died in the brief battle.

the village.¹¹ For his actions on the day of March 2, 1942, Major Müller would receive the Knight's Cross and be promoted to Colonel.¹²

As he surveyed the scene of Osadche, Klaus Müller must have wondered if he knew any of the Soviet armored officers who had just become casualties. Müller was no stranger to Russia.¹³ He, and many of his fellow German armored officers, had been there many years before, in a very different capacity. In 1926, the Reichswehr and the RKKA had established a secret military base in the city of Kazan, deep inside the Soviet Union. During its years of operation, Kama was the most important armored warfare center for the German military and among the most important for the Red Army.¹⁴ The facility at Kama served as a school for a new generation of combat officers, a battlefield for new doctrines of mobile warfare, and a testing ground for new technologies.¹⁵ According to

¹¹ "Vorschlagsliste Nr. 6 für die Verleihung des Ritterkreuzes des Eisernen Kreuzes [Proposed List #6 for the Award of the Knight's Cross of the Iron Cross]," p. 4.

¹² Ibid. This was to be his last promotion of significance during the war. Müller had been in non-combat positions until 1942, as a staff officer and as the commander of a mine-clearing battalion which did not partake in Operation Barbarossa. After a brief leave over Christmas of 1941, he reached Ukraine to take command of Panzer Abteilung 60. After five months on the front lines in Ukraine, he was transferred back to Wa Prüf 6, the Tank and Motorized Equipment Inspectorate. At that time, his commanding officer noted that despite Müller's outstanding technical expertise with armored vehicles, he had grown increasingly "negative in attitude" and "less than dexterous physically." It appears his months of fighting in Ukraine, culminating in the battle of Osadche, had left a mark on Müller. ("Beurteilung zum 1.4.1942, Klaus Müller [Evaluation of April 1, 1942, Klaus Müller]," April 1, 1943, R242, A 3356, 580 (NARA), p. 1.)

¹³ Klaus Müller, *So lebten und arbeiteten wir 1929 bis 1933 in Kama [So we lived and worked at Kama, 1929-1933]*, (1972). I owe a great debt to Dr. Mary Habeck for her assistance in giving me a copy of this unpublished memoir, one of the few extant accounts of the life of officers stationed in Russia. It has proven a very valuable primary source.

¹⁴ Kama was the first, and from 1927 to 1933 the only, armored training facility for German officers. Theoretical classes were offered at facilities near Berlin as an auxiliary to ongoing studies at Kama, but nowhere else did German officers receive hands-on training. In 1933, when Kama was closed down, the teacher, students and staff of Kama were brought back to Germany and established at Wünsdorf, just outside of Berlin. This, under the codename of an Automotive Training Base, officially became the first *Panzertruppenschule* in 1936. A second school for armored officers opened the following year at Kramnitz. The commandant of Kama, Josef Harpe, remained the head of armored training at Wünsdorf through 1935.

¹⁵ The codename "KaMa" was a combination of the words "Kazan," the city near which the facility was located, and "Malbrandt," the German officer first assigned with assisting the Soviets in site selection. The

Müller's memoirs, Soviet and German officers learned together, drank together, and even wore each other's uniforms.¹⁶ Kama would become the central tank testing ground and training facility for both the Soviets and German military during its time of operation.

Many of the Wehrmacht's most prominent practitioners of war spent time, lived, trained and learned at Kama. So did the corporate engineers most responsible for Germany's Panzer program. But Germany's operational doctrine of mobile warfare required more than just capable vehicles. It also required the ability to command and control them on the field of battle. It was at Kama that the Germans began to develop the radio technologies which enabled some of their early battlefield successes. The development of both tank and radio prototypes will be dealt with in detail here. This paper will show that some of the most important Soviet and German technologies of the Second World War grew out of the work done at Kama. Those technologies, in turn, informed major changes in German armored doctrine.

Kama played a different role for the Red Army, but was nonetheless an important component of the Soviet armored program. While Kama had a much smaller place in the development of Soviet armored doctrine than in the German case, it did impact Soviet training methods, which in turn affected tactics. More importantly, as noted earlier, the Red Army began a massive armament and mechanization program in 1929. The Soviets perceived Kama as one of the central training locations for Soviet engineers who worked on the mechanization of the Red Army. In a connected process, research at Kama helped

name was later changed to "TEKO," or "Technical Courses of the Society for Defense, Aviation and Construction of Chemical Weapons."

¹⁶ Müller, p. 28-29.

to shape the tank procurement program administered by Mikhail Tukhachevsky, initially encouraging their light tank development program. Few of the Red Army officers who trained at Kama would survive the purges, but the ideas and technologies produced by the facility would have a lasting impact on the Red Army.

EARLY ARMORED DOCTRINE IN GERMANY

Germany had ended the First World War with a decided disadvantage in tank technology. The Landship Committee, formed in 1915, pioneered the early development of the tank in Great Britain. The French and Russians began systematic efforts in the same year.¹⁷ At the same time, several young German and Austrian officers drew up armored vehicle designs, but were rejected by their respective military establishments. Only after seeing British tanks in use at the Battle of the Somme did the Germans begin to seriously consider the development of armored vehicles.¹⁸ In late 1916, the German General Staff appointed Josef Vollmer, an automobile engineer, to serve as the first head of the German War Department's motorized vehicle design bureau. But Vollmer lacked both financial resources and political support. One sign of the German General Staff's disinterest in his work was the fact that Vollmer was only given the rank of Captain.¹⁹ By contrast, the British Landship Committee had been organized by none other than Winston

¹⁷ A few armored vehicle designs existed even prior to the war, but 1915 marks the beginning of systematic efforts within military and government institutions to mass produce armored vehicles to break the stalemate on the Western Front.

¹⁸ Willi Esser, *Dokumentation über die Entwicklung und Erprobung der ersten Panzerkampfwagen der Reichswehr* [Documentation about the Development and Testing of the First Reichswehr Tanks], (München: Krauss Maffei AG, 1979), p. 1.

¹⁹ Semen Fedoseev, *Tanki Pervoi Mirovoi Voini* [Tanks of the First World War], (Moscow: Eskmo Publishing, 2010).

Churchill, and despite difficulties with the army, had the financing and support of the Royal Navy.²⁰

The late and reluctant arrival of the Germans to the “tank race” meant a vast gap in experience and technical skill when the war ended. By 1918, the British and French had produced 6,891 tanks, while the Germans completed only 20.²¹ As a result, Germany did not have the technical and operational expertise that had been developed in the Entente powers. After the war, the Reichswehr’s *Ausbildungsabteilung* [The Training Department] managed study groups of officers who examined the conduct of World War I and the causes of German defeat. These aggregated reports stressed the role of the tank in Entente victory.²² This further spurred Reichswehr interest in the pursuit of new armored warfare technologies and ideas.

In the aftermath of the First World War, the response to the problem of tanks led to the loose formation of three schools of thought within the defeated German Army.²³ The first, headed by older, more conservative officers, argued that tactical changes had proven to be of greater worth than changes in technology; they emphasized the value of infantry, artillery and the continuing importance of cavalry. Another school saw in World War I evidence of the overwhelming technological nature of modern warfare. They argued that Allied victory had been brought about, in large part, through the superiority

²⁰ Kenneth Macksey, *Tank Warfare: A History of Tanks in Battle* (Oxford: Osprey Publishing, 2013), pp. 16-20.

²¹ The only German tanks which saw operational combat were the A7V Heavy Tanks.

²² Williamson Murray, “Armored Warfare: The British, French and German Experiences,” in *Military Innovation in the Interwar Period*, edited by Williamson Murray and Alan Millet (Cambridge: Cambridge University Press, 1996), pp. 37-41.

²³ Mary Habeck, *Storm of Steel: The Development of Armor Doctrine in Germany and the Soviet Union, 1919-1939* (Ithaca, NY: Cornell University Press, 2003), pp. 6-7.

of their armored vehicles and aircraft. These officers believed in “technical training for officers” in new military technology and the greater inclusion of civilian engineers in preparations for war.²⁴ Finally a third school sought compromise between the two, arguing that tank warfare should supplement existing doctrine about the deployment of infantry and tanks. In such a support role the new technology could find use. The frictions between these various factions would continue until 1934, when Hitler endorsed large-scale tank construction, and armored maneuvers in Germany increasingly demonstrated their worth. But the years 1919 to 1933 witnessed the foundations of future German armored warfare prowess: the first postwar German tank construction was initiated secretly in 1925; the German High Command endorsed an independent tank arm in German military publications in 1926; and most of the future theorists and practitioners of war would begin training with armored vehicles in 1929 – at Kama. These critical developments were essential for the future development of the German tank force.

Contrary to the claims of Guderian and some of his admirers who wrote in the 1950s, the Reichswehr was not hostile towards new technologies of war. Seeckt created room within the Reichswehr for new ideas regarding new technologies to flourish, particularly in aviation and armored warfare. In 1920, Seeckt began requiring the inclusion of model tanks in all maneuvers and major war games.²⁵ He pushed for the mechanization of artillery within the bounds allowed by the Treaty of Versailles.²⁶

²⁴ Habeck, p. 71.

²⁵ Corum, *The Roots of Blitzkrieg: Hans von Seeckt and German Military Reform* (Lawrence, KS: Kansas University Press, 1992), p. 133.

²⁶ R.L. DiNardo, *Germany's Panzer Arm* (Westport, CT: Greenwood Press, 1997), pp. 75-77.

Further, he placed all mechanized vehicles (at the time, only a handful of armored cars qualified) under the control of the *Inspekteur der motorisierten Truppe* [Inspectorate of Motorized Troops] which had been formed in April 1915 and managed tank development during the war.²⁷ This put the development of the tank in the hands of its strongest proponents. Seeckt also ordered the formation of “Motor-Transport Battalions,” thinly veiled cadres for future armored formations.²⁸ However, despite these innovations, official doctrine remained limited due to the lack of experience and limited access to actual armored vehicles. German theorists depended on observations of British and French maneuvers and the writing of foreign theorists. J.F.C. Fuller was far and away the most important of these, receiving extensive coverage in *Militär-Wochenblatt*, the main theoretical journal of the Reichswehr.²⁹

In *Führung und Gefecht de Verbundenen Waffen* [Command and Combat of Combined Arms, or Das F.u.G], the primary military manual of the Reichswehr years, armored vehicles was more or less absent altogether.³⁰ The increasing rate of technological progress after the war convinced Seeckt to add an addendum to this work two years later that did discuss the place of tanks in warfare.³¹ Here he articulated a two-

²⁷ Corum, *The Roots of Blitzkrieg*, p. 133.

²⁸ Habeck, p. 21.

²⁹ Particularly influential was his work *The Reformation of War*, which appeared in 1923. Fuller there argued for the mass mechanization of an entire army, claiming that a small, mechanized force could defeat much larger mass armies; as he wrote, “it would appear to be a common-sense action to replace the traditional arms by Tanks.” J.F.C. Fuller, *The Reformation of War* (London: Hutchinson Press, 1923), p. 156. It was somewhat problematic for the Soviets to cite him as an authority because of his political views – he was a fascist, imperialist and occultist.

³⁰ Bruce Condell and David T. Zabecki, “Editor’s Introduction,” pp. 1-14 in *On the German Art of War: Truppenführung* (Boulder, CO: Lynne Rienner Publishers, 2001), pp. 2-3.

³¹ Robert Citino, *The Path to Blitzkrieg: Doctrine and Training in the German Army, 1920-1939* (Boulder, CO: Lynne Rienner Publishers, 1999), pp. 12-13.

echelon approach, with heavier tanks in front and lighter tanks behind, each accompanying advancing infantry in lockstep.³² Tanks were to be used to support an infantry breakthrough of an enemy front, and assigned as support vehicles through the regimental level. In essence, tanks remained “an all-purpose infantry support weapon in a war of movement.”³³ This was, at the end of the war, the British doctrine. Interestingly, in both the Soviet Union and Germany, military thinkers sought to find a parallel service branch. The logical source for doctrine would have been the cavalry branch, but in both militaries, the cavalry was the most conservative service and the most openly hostile to tank development.³⁴ As a result, German theorists placed the tank as an auxiliary weapon among infantry; one officer described tanks as modern day elephants.³⁵ Early tank tactics would draw theory from evolving infantry tactics, which in Seeckt’s Reichswehr emulated World War I “stormtroop” tactics.³⁶

It was the work of Ernst Volckheim which paved the way for a refinement of German armored principles. He had been one of the first armored officers in the German Army, serving in the first tank-on-tank combat at the Battle of Villers-Brettoneux in 1918.³⁷ Retained after the downsizing of the Reichswehr, he was assigned to the

³² Citino, *The Path to Blitzkrieg: Doctrine and Training in the German Army, 1920-1939*, p. 22.

³³ Corum, *The Roots of Blitzkrieg*, p. 125.

³⁴ Compare this to the United States’ experience, where the cavalry branch actually led much of the mechanization drive during World War I. George S. Patton was among the cavalrymen who switched to the US Army Tank Corps during the war.

³⁵ Habeck, p. 21.

³⁶ For the best analysis of the evolution of that tactical system, see Bruce I. Gudmundsson, *Stormtroop Tactics: Innovation in the German Army, 1914-1918* (Westport, CT: Praeger Publishers, 1989).

³⁷ “Personal-Nachweis, Ernst Volckheim [Personnel File of Ernst Volckheim],” 1945, R242, A 3356, 879 (NARA).

Motorized Inspectorate in 1923.³⁸ He began teaching armored warfare courses in 1925.³⁹ Between 1922 and 1928 he wrote three books on armored warfare, founded a journal called *Der Kampfwagen* [*The Combat Vehicle*] and penned a number of influential articles in the Reichswehr's weekly journal, the *Militär Wochenblatt*.⁴⁰ His journal, which appeared in six volumes between October 1924 and March 1925, had only one coauthor: Heinz Guderian, the famed future Panzer commander and writer.⁴¹

Their articles spurred broad interest in tanks among the German officer corps. Among Volckheim's more prescient arguments were that improvements in technology would reverse the relationship between tanks and infantry; at some point in the future, infantry would become auxiliary to armored vehicles, which would be the decisive arm. In addition, he argued against the status quo at the time by positing that it was the armor and gun of the tank, rather than its speed, which were its decisive elements. This meant that instead of endorsing the production of many light tanks which had high speeds and maneuverability, the German army should focus on producing medium tanks that were fast enough to encircle enemy forces, but heavy enough to defeat opposing tanks and artillery if necessary.⁴² A sign of Volckheim's immense importance to the development

³⁸ "Personal-Nachweis, Ernst Volckheim [Personnel File of Ernst Volckheim]."

³⁹ Ibid.

⁴⁰ Ibid. *Der Kampfwagen* is often translated as *The Tank* in English language literature, but there was reason that Volckheim used *Kampfwagen* instead of *Panzerkampfwagen* [Armored Combat Vehicle, the German term for tank] besides drawing a slightly larger audience with the broader term, it less clearly impinged upon the limitations of the Treaty of Versailles.

⁴¹ "Der Kampfwagen 1-6," October 1924- March 1925, edited by Ernst Volckheim, ZAN 2511/109, New York Public Library Archives (NYPLA). It should be noted that Volckheim's writings were far more innovative and imaginative than Guderian's early work, contrary to what the latter would later say about his role in the development of German armored doctrine. Guderian's role would come later, with the maneuvers of 1934, his advocacy for tanks with Adolf Hitler and the publication of *Achtung- Panzer!* in 1937.

⁴² Habeck, p. 49.

of German armored doctrine, his work *Der Kampfwagen in der heutigen Kriegsführung* [The Tank in Today's Warfare] was assigned as the primary textbook for all armored officers beginning in 1924.⁴³ Besides his writing, Volckheim would personally train many of the future Wehrmacht's armored officers: he served in Russia at Kama as an instructor of armored warfare. In that position, he would train a number of young officers, including Klaus Müller.⁴⁴

By 1926, advances in armored technology in France, Great Britain and the United States seemed to be justifying Volckheim's arguments.⁴⁵ Around him, a new generation of armored warfare advocates began to develop.⁴⁶ Fritz Heigl, one of the other early

⁴³ "Betrieb: Kampfwagenausbildung im Heere [Operation: Armored Warfare Training in the Army]," March 24-25, 1924, RH/12/2- #51, 2673, Bundesarchiv-Militärarchiv, Freiburg im Breisgau (BA-MA), 13.

⁴⁴ Müller, *So lebten und arbeiteten wir*, 27. James Corum has argued, correctly in my opinion, that Volckheim was the impetus behind many of the technological and doctrinal changes in German armored warfare between 1922 and 1933. Guderian, among others, read his work closely. The two men were the only two contributors to *Der Kampfwagen* during its short existence. Volckheim, in his association with the Motorized Inspectorate, may have also assisted Hans Pirner, another influential figure, in drawing up specifications for future combat vehicles. Pirner, for instance, required that all tank prototypes built between 1922 and 1926 come with a space reserved for a mobile radio, even though no mobile radio had yet been developed. Such foresight played a huge role in the German superiority in armored operational capability in 1939. Volckheim remains largely unknown because of his limited combat record; he failed to achieve promotion in the 1930s, perhaps due to what his superiors called his "nervous and jumpy disposition." He ended up managing motor pools during World War II. "Personal-Nachweis, Ernst Volckheim [Personnel File of Ernst Volckheim]."

⁴⁵ Habeck, p. 51. Mary Habeck argues that this change began to appear as soon as 1925, based on the famed British wargames held in that year. These involved new armored vehicles, including Britain's newest medium tank produced by Vickers. The widespread publicization of these wargames and the technical successes of the vehicles played a major role in improving attitudes towards the capabilities of the tank in German and Russian circles.

⁴⁶ The most notable other theorists in the 1920s were Oswald Lutz (who would take over the Inspectorate for Motorized Troops in 1928 and be the first head of the Panzer troops), Hans Pirner and Engineer Wilhelm Brandt. The first two men were both intimately involved with the foundation and operation of Kama, Lutz in a supervisory capacity and Pirner as an instructor. "Personnel File of Oswald Lutz," 1945, R242, A 3356, 516 (NARA). Lutz served as a captain in the Bavarian Engineers Corps during World War I. The 100,000-man army retained him and gave him the position of Inspector of Mobile Troops, from which he promoted mobile warfare and argued that it was tanks which had guaranteed the Allied victory. Lutz was one of the most important early proponents of Germany's armored force. He became the head of the German armored forces in 1931. The rapid expansion of the German Army after Hitler came to power led to his promotion to head of all Panzer troops; in this role, he supervised the rapid growth of Germany's tank forces. Incidentally, Heinz Guderian served as his chief of staff, a role he would use to develop his

theorists, penned "Taschenbuch der Tanks," a "pocket" guide to armored tactics and technology which would become assigned reading in both Germany and the Soviet Union; Stalin had a personal copy.⁴⁷ But there remained considerable hesitancy within the Reichswehr towards the adoption of the tank, particularly among cavalrymen who made up 30 percent of the German Army's combat strength.⁴⁸ The attitude towards armored warfare had visibly shifted by 1927, as previously skeptical officers such as von Fritsch and von Blomberg began to treat "tank units as operationally independent units instead of as infantry support weapons."⁴⁹

The debate could not be fully resolved until German officers could actually train with tanks and use armored vehicles in maneuvers. Versailles rendered this impossible. Before Kama, German theorists had to develop doctrine with "paper panzers" – automobiles with wood and sacking added to give the rough appearance of a tank.⁵⁰ Their changing valuations of tank technology, until May 1929 when the testing of the first German prototypes began at Kama, were dependent on consumption of intelligence reports regarding foreign tank construction and visits to foreign maneuvers. Until 1926, Allied inspectors hindered the work of Germany's major arms manufacturers on

own reputation as one of the German Army's leading experts on the tank. Lutz and Guderian visited Kama and supervised the selection of students and staff, but never resided there themselves. For a self description of Guderian's activities during the interwar period, see Heinz Guderian, *Erinnerungen eines Soldaten [Recollections of a Soldier]* (Stuttgart: Motorbuch, 2001), 464 pages.

⁴⁷Habeck, p. 151.

⁴⁸ Guderian would claim after the war that armored innovation had taken place only against howling opposition, but the reality was different. Much of the process of dialogue and innovation in armored warfare took place secretly because of the Treaty of Versailles, hence, the appearance to the outside world that the German Army had not embraced the tank in the way that other armies had.

⁴⁹ Corum, *The Roots of Blitzkrieg*, p. 131.

⁵⁰ David Stone, *Hitler's Army: The Men, Machines, and Organization: 1939-1945* (Minneapolis, MN: MBI Publishing Company, 2009), p. 28. Also, "Betrieb: Kampfwagenausbildung im Heere [Operation: Armored Warfare Training in the Army]," p. 13.

forbidden technologies.⁵¹ After January 31, 1927, when the inspectors withdrew, many German firms were willing to risk the production of tank prototypes within Germany, but not the riskier proposition of testing them within the nation's boundaries.⁵² As the head of Red Army intelligence would claim, "the Germans lack detailed and well-thought out tactics for armored warfare. They have no tactical experience in working with large numbers of tanks. All their ideas are based on theory and commonplace tactical thinking."⁵³ This challenge led the Reichswehr's senior leadership to look outside of Germany for help, towards the Soviet Union.

Both Soviet and German theorists heavily emphasized mobility in war during this period. One reason for this was the shared experience of the Eastern Front in World War I. Whereas France (and the military establishment in Great Britain, to a lesser degree) had endured trench warfare and developed defensively minded tactics in the interwar period, Russia and Germany had fought highly mobile, encirclement-oriented battles on the Eastern Front during the First World War. During the 1920s, they drew similar lessons from that shared experience. The degree to which tanks could fulfill the functions envisioned by theorists – penetration and encirclement – depended largely upon technical

⁵¹ Whaley, p. 3

⁵² The Krupp Firm, most aggressive in its rearmament work, once allowed a number of foreign journalists access to its main facilities in Essen, where it was producing a number of illegal technologies. They were split up into groups and given different itineraries to make sure none suspected that they were not being shown the full facility. In addition, during the farewell lunch, Krupp security personnel subtly irradiated all of their camera equipment to make sure that they had not accidentally photographed anything – like blueprints or machinery – that might be recognized as war materiel upon closer examination (Whaley, p. 34).

⁵³ Ianis Berzin, "Tov. Tukhachevskomy, Predstavliau uchebnii otchet no. 2 nach-ka tankovikh kursov v Kazani ob itogakh sovместnoi c "druzyami" uchebi za letnii period, [To Comrade Tukhachevsky, presenting training report number 2 on the conduct of tank study courses at Kazan over the summer period with "friends"], September 13, 1931, 33988-3-205, l. 237, RGVA (#213, Y-RAP), pp. 1-22, p. 8.

performance issues. As a result, during the years of Kama's operation (1927 to 1933) the evolving dialogue about the use of tanks in combat continued to be driven in large part by changes in technology.⁵⁴

It was during those six crucial years that the major theorists of armored warfare could actually experience, drive and test armored vehicles for the first time since World War I. By the end of the period at Kama, even staunch anti-armored officers such as Ludwig Beck were beginning to recognize the value of the tank. When he wrote the two-part *Truppenführung* (1933, 1934), the new military manual, he included a clear role for the tank:

The objectives for tank attacks are primarily the enemy's infantry (especially his heavy weapons, artillery batteries with their observation posts, command posts, reserves, tanks, and rear services and their installations....During pursuit operations, tanks are assigned aggressive missions and deep objectives....In combat an armored unit should be committed against the flanks and rear of the enemy, or committed to breaking through the enemy lines.... One or more tank regiments can be grouped with other motorized units and support troops into a combined arms armored force....Armored units and their attached light motorized groups frequently will be required to operate out of contact with rear communications.⁵⁵

The concept of operationally-independent, combined arms tank forces used for encirclement and pursuit, rather than assisting infantry in waging positional warfare,

⁵⁴ There were also a number of decisive actions taken in organizational terms leading up to Kama which enabled the full exploitation of the lessons of Kama. The expansion of the Inspectorate of Motor Troop's school was one step. So too was the establishment of the first panzer battalion was organized under Inspectorate of Motor Troop's school director Alfred von Volland-Brockelberg in 1927. (Corum, 136)

⁵⁵ *On the German Art of War: Truppenführung*, edited and translated by Bruce Condell and David T. Zabecki (Boulder, CO: Lynne Rienner Publishers, 2001), pp. 191-195. Habeck characterizes this manual as a step backwards for tank doctrine, but compared to its predecessors, it strikes me as rather more neutral. Habeck, pp. 100-101.

marked the completion of the major doctrinal shift in German armored doctrine for which Kama was, in part, responsible.

EARLY SOVIET ARMORED DOCTRINE

The Russian Imperial Army never managed to deploy tanks in the First World War, although it had built several prototype designs. The first, designed in 1914, was the “Tsar tank,” a massive armored vehicle which resembled a misshapen tricycle. But it was important for several reasons: it was among the first technical-scientific research projects funded by the state. Of the four lead designers, three of them would play important roles in the development of Soviet military industry.⁵⁶ While the Tsar Tank brought some of Russia’s top engineers together, it was a dismal failure which broke down and could not easily traverse muddy terrain. After tests in August 1915, it was abandoned then taken apart for scrap.

The nature of warfare on the Eastern Front made slow-moving armored vehicles redundant, and neither the Russian Imperial Army nor the Germans would deploy tank units. It was during the Russian Civil War that the country witnessed the first tank action. The Red Army had organized an Armored Forces corps made up of armored trains, armored cars and improvised armored vehicles. These last were usually trucks or cars

⁵⁶ Nikolai Zhukovsky, a famed aviation pioneer, would go on to found the Central Aerohydrodynamic Institute, or TsAGI, the Soviet Union’s first aircraft design studio. The much younger Boris Stechkin, who had also co-designed with the world’s first four engine bomber (the Ilya Muromets) with Igor Sikorsky, became an important protégé of Zhukovsky’s. After the Revolution, he would work both at TsAGI as well as for Tupolev’s design bureau. Alexander Mikulin, the youngest of the engineers (19 years old in 1914) was brought on in part because he was Zhukovsky’s nephew. He would go on to have an immensely distinguished career, designing the Soviet Union’s first water-cooled engines (copies of German models purchased during the 1920s) and eventually receive control of his own design bureau, Mikulin OKB.

with metal armor plates welded on, perhaps mounting a heavy machine gun. During the war, a number of British Mark V and French Renault FT-17s tanks were delivered to the Whites, all of which were captured and put to use by the Red Army. Reverse engineering the Renaults led to the first Soviet-built tank, called the “Freedom Fighter Comrade Lenin,” which was produced by workers in Nizhny Novgorod in 1920.⁵⁷ But given the limited role performed by tanks in the First World War and the Russian Civil War, it is not a tremendous surprise that this was not a priority area in the crafting of doctrine.

In the waning days of the Russian Civil War, the Red Army established the *Avto-Bronetankovoe Upravlenie* [Directorate of Armored Forces] and concentrated their armored vehicles into formations. But in the rush of demobilization after the war, most of the tanks were either left to rust or put to work elsewhere – in 1922, the Red Army transferred six tanks to Ukraine to help with the harvest as tractors.⁵⁸ In the 1923 military spending program, the Armored Forces received only 20 million rubles, or 0.7 percent of the Red Army’s budget.⁵⁹ In a further sign of disregard, the Armored Forces were merged into the *Glavnoe Artilleriiskoe Upravlenie* [Main Artillery Department or GAU] in 1923.⁶⁰ This would have a major impact on the development of tank doctrine: from 1923 to 1929, ideas on the deployment of tanks rested on the assumption that tanks were more or less motorized artillery pieces. The language of Soviet doctrine made this exceedingly

⁵⁷ Mikhail Svirin, *Bronya Krepka: Istoria Sovetskogo Tanka 1919-1937* [The Armor is Strong: The History of the Soviet Tank 1919 to 1937], (Moscow: Iauza I Eksmo, 2006), pp. 40-41.

⁵⁸ Habeck, p. 30.

⁵⁹ Ibid, pp. 32-33. This was a five-year budget projection.

⁶⁰ Svirin, p. 56. This was done more in the name of administrative simplicity than any particular malice towards tanks. Habeck, p. 35.

clear: tanks were to be organized into *batteries*, and later *field* and *headquarters* units, just as artillery were.⁶¹

But the Soviets, just like the Germans, kept a close eye on foreign developments. They were particularly familiar with the works of Fuller (whom Tukhachevsky translated into Russian) and Liddell-Hart.⁶² In 1923, the Central Directorate of Military Industry established the first Tank Design Bureau within the *Glavnoe Konstruktorskoe Biuro Orudiino-Arsenalnogo Tresta* [Main Design Bureau of the Arsenal Gun Trust or GKB-OAT] in Moscow, headed by S.P. Shulakov and staffed with ten engineers.⁶³ These began working on indigenous tank designs, but generally drew most of its inspiration from prototypes in England, the United States and France. The Soviet Union's first domestically designed tank, the T-16, was more or less a copy of the French FT-17, the most advanced tank captured during the Russian Civil War.⁶⁴ But even that small tank took years to be able to replicate in numbers. There were half a dozen major bottlenecks to mass production. For instance, Russian industry lacked engine production facilities,

⁶¹ The incompetent old Bolshevik military officer Pavel Dybenko argued in 1927 that tanks should simply replace all artillery, a pitch that found supporters within the GAU. Habeck, pp. 34-35; 107.

⁶² There is some considerable irony in the frequent references to Liddell-Hart in Russian tactical literature. Liddell-Hart, famously self-promoting, claimed that he had been the inspiration for the development of interwar German armored doctrine and the idea of "blitzkrieg" after the Second World War. He even altered Heinz Guderian's memoirs, which he translated, to increase his importance in Guderian's thinking, which was also exaggerated immensely in influence on German developments. See Corum, *The Roots of Blitzkrieg*, pp. 136-143. But both Tukhachevsky and Triandafillov frequently cited Liddell-Hart's works as early as 1927, when his first major monograph appeared. That he was a major inspiration to what would turn out to be the less reputable Soviet doctrinal system likely would have flattered his ego somewhat less than his claimed contributions.

⁶³ Larisa Vasilieva, Igor Zheltov, Galina Chikova, *Pravda o Tanke T-34: Fakti, Dokumenti, Vospominania I Raznie Tochki Zrenia ob Odnom iz Chudes XX Veka* [The Truth about the T-34: Facts, Documents, Reminiscences and Different Points of View about One of the Wonders of the 20th Century] (Moscow: Atlantida-XXI Veka Press, 2005), p. 13.

⁶⁴ Steven J. Zaloga, James Grandsen, *Soviet Tanks and Combat Vehicles of World War Two* (London: Arms and Armour Press, 1988), p. 36.

forcing the conclusion of a concessionary agreement with Italy's Fiat Corporation to make a 35 HP tank engine for the T-16.⁶⁵ The first prototype with Russian modifications – an improved suspension and gun – did not appear until May 1927.⁶⁶

As design work began in 1924, so did reorganization within the Red Army. Along with transfer into the *GAU*, all of the Red Army's tanks were grouped into a “cadre and training” battalion comprised of 356 men and 18 tanks of a variety of obsolete types.⁶⁷ There was little theoretical framework at this juncture for the use of tanks. They were simply concentrated for maintenance and training purposes. While the 1926 military construction program envisioned the production of 1,075 tanks of various types – mostly light tanks – over the following five years, a vast expansion of the program, almost none were actually built. Armored vehicles took a secondary role to aircraft and artillery production. In fact, what little armored forces the Red Army possessed deteriorated badly: in 1928, an inspection of the top tank regiment in the RKKKA revealed that it had only nineteen tanks in its motor pool, six of which had no guns and nine of which were mechanically unfit for active service.⁶⁸ At that juncture, Soviet and German armored forces were in much the same place: almost no vehicles had been produced domestically, which in turn handicapped doctrinal developments, forcing reliance on foreign, particularly British developments.

The revolution in Russian armored doctrine did not begin until 1929, triggered by “contact with the Germans as well as a profound reassessment of strategy by Red Army

⁶⁵ Zaloga, Grandsen, p. 36.

⁶⁶ *Ibid.*, p. 36

⁶⁷ Svirin, p. 57.

⁶⁸ Habeck, p. 89.

theorists.”⁶⁹ The major movers in this transformation were Tukhachevsky and Triandafillov, whose ideas on deep battle were noted earlier. In a series of reports to the RVS in 1929, Triandafillov laid out his own concept for a Soviet armored force.⁷⁰ He envisioned four classes of tanks: a tankette weighing 3 tons and capable of speeds up to 50 kilometers an hour on roadways. Its function would be encirclement, destruction of command posts, artillery and other “deep” penetrations. Next, he foresaw a small tank weighing around 7 tons capable of speeds of 30 kilometers per hour. Its purpose would be to exploit “breakthroughs in maneuver warfare,” once gaps had been created by the next class of vehicle.⁷¹ This was the medium tank, weighing sixteen tons, capable of “breaking through fortified positions in either maneuver or positional warfare.”⁷² Finally, for “breaking through powerfully reinforced lines” was the heavy tank, weighing 60-80 tons and mounting two 76 mm guns.⁷³ As the last two classes of tanks were too heavy for Russian bridges, they would need to be buoyant or watertight and capable of fording rivers on their own.

In terms of operations, the increasing speed of tanks led Triandafillov to an inevitable conclusion:

The speed of tanks, both at tactical and operational levels, is far faster than the other ground combat arms...neither infantry nor cavalry can keep up with a tank capable of 300 kilometers a day or speeds of 20 kilometers an hour for several hours. Attaching tank units to cavalry or infantry limits their roles to an auxiliary weapon – and this means abandoning the tactical and operational utility of the

⁶⁹ Zaloga, Grandsen, p. 43.

⁷⁰ Vladimir Triandafillov, “Postanovlenie Revolyutsionnogo Voennogo Soveta Souza SSR [Decree of the Revolutionary Military Council of the USSR],” July 18, 1929, 4-2-504, l. 3, RGVA, p. 1.

⁷¹ Vladimir Triandafillov, “Postanovlenie Revolyutsionnogo Voennogo Soveta Souza SSR [Decree of the Revolutionary Military Council of the USSR],” July 18, 1929, p. 1.

⁷² Ibid.

⁷³ Ibid, p. 1-2.

tank. Naturally, these properties of the tank should be used to the fullest; this is only possible as part of separate mechanized formations.⁷⁴

Triandafillov's conceptualization of the tank would become the basis for tank doctrine for the next eight years.⁷⁵ It fit into the broader doctrine of "deep battle" being simultaneously developed by Mikhail Tukhachevsky. The "three echelon" approach offered the possibility of striking in depth, taking advantage of the different technical attributes of each class of tank. Fast tanks of reasonably heavy armor were grouped together as *Dal'nii poderzhok pechoti* [Distant Infantry Support, DPP; they would lead the assault on enemy positions, seeking to eliminate enemy tanks and machine gun positions.⁷⁶ The next wave, which would enter combat alongside infantry, were designated *neposredstvennii poderzhok pechoti* [Direct Infantry Support, NPP]; heavier, slower tanks, they would lead infantry into combat against fortified positions. The most important and tactically controversial group were the fast, light tank squadrons, referred to as *Gruppa dal'nego deistvia* [Long Range Action Group, GDD or DD].⁷⁷ These would break through enemy lines with artillery support before the general infantry assault, attacking headquarters, communications hubs and artillery positions before encircling enemy units.⁷⁸

This evolution in tank doctrine would be accompanied by broader structural changes in the Red Army, most importantly the formation of the *Upravlenie Motorizatsii*

⁷⁴ Triandafillov, "Postanovlenie Revoliutsionnogo Voennogo Soveta Souza SSR [Decree of the Revolutionary Military Council of the USSR]," July 18, 1929, pp. 15-16.

⁷⁵ Zeidler, p. 197.

⁷⁶ Habeck, p. 155.

⁷⁷ Zeidler, p. 197.

⁷⁸ Habeck, p. 155.

I Mekhanizatsii [Bureau of Motorization and Mechanization, or *UMM*] which removed tank development from the Artillery Bureau and placed it in the hands of an independent agency.⁷⁹ Thus, the German presence at Kama occurred during a critical time in the formation of Soviet armored doctrine: just as tank advocates succeeded in convincing the RVS and Stalin of the worth of tanks as an independent, rather than auxiliary force.

THE FOUNDATIONS OF KAMA

During his March 1926 visit to Berlin, Josef Unschlikht met with the Truppenamt to discuss the expansion of direct military cooperation. This trip initiated talks on chemical weapons cooperation. Another priority area for both sides was tank development. After the agreement of some preliminaries, Seeckt assigned Colonel Lieth-Thomsen in Moscow the task of negotiating the details of the arrangement with the RVS. On December 9, 1926, Voroshilov and the Reichswehr agreed to the final terms of a three-year German lease of a to-be-determined military facility for the purpose of joint tank training and testing.⁸⁰ The Reichswehr then dispatched Major A.D. Malbrandt to select, in cooperation with Red Army officials, an appropriate location for a tank school in the environs of Kazan, a major city situated along the banks of the Volga river. The committee decided that the central living facilities would be established in Kargopol Barracks, an old Tsarist facility that had once housed the Fifth Dragoons Regiment.⁸¹ The RKKKA officially transferred the facility to the Reichswehr on February 1, 1927 at the

⁷⁹ Zaloga, Grandsen, pp. 44-46.

⁸⁰ Zeidler, p. 189.

⁸¹ Gorlov, pp. 75-89.

cost of 125,000 rubles.⁸² An engineer named Conrad Baumann had arrived in 1927 to update the facilities. Working with Russian engineers and a Russian construction team, they remodeled the “staff and teaching buildings, the armory, the small-bore shooting range, as well as the living quarters.”⁸³ They also made the building of the Offizierkasino an early priority.⁸⁴

While work on the Kargopol Barracks proceeded, Malbrandt and representatives from the RVS, also selected an open range for tank maneuvers and gunnery drills on a site some six miles from Kargopol Barracks.⁸⁵ It was called the *Polygon* in both Russian and German sources. Polygon is the term generally used to refer to a testing grounds or firing range in Russian. The Germans picked up the term during their time at Kama. This testing ground and shooting range was apparently close to some industrial structures, as on at least one occasion, factory workers were injured by errant shells.⁸⁶ The Soviets selected the name “KaMa” for the whole facility in 1926, combining the words “Kazan” and “Malbrandt.” This turned out to be a comically poor code name, as a river near the

⁸² Zeidler, p. 188.

⁸³ Müller, *So lebten und arbeiteten wir*, p. 3.

⁸⁴ Spetsial'naya svodka o sostoaniy 'Tekhnicheskikh kursov Osoaviakhim» [Special Report on the Technical Courses of OSOAVIAKhIM].” August 15, 1930, 109-15, 1. 1-8, Archive of the FSB of the Russian Federation in the Republic of Tatarstan (AFSB-RF-RT), digitized by Bulat Sultanbekov and Sirena Khafizova, reprinted in “Kama na Volge [Kama on the Volga],” *Nauchno-Dokumentalniy Zhurnal Gazirlar Avazi* [Scientific-Documentary Journal Gasirlar Avazi], Issue 2, 2005, accessed Jan 3, 2012, http://www.archive.gov.tatarstan.ru/magazine/go/anonymous/main/?path=mg:/numbers/2005_2/04/04_41 . The journal of the Tatarstan Oblast Archives printed this collection of documents from the Oblast FSB Archives in 2005 – it is a very valuable source. I applied for access and (was kindly assisted with advice by one of the editors of this journal), but was not able to gain entry to the local FSB archive.

⁸⁵ “Spetsial'naya svodka o sostoaniy 'Tekhnicheskikh kursov Osoaviakhim» [Special Report on the Technical Courses of OSOAVIAKhIM].”

⁸⁶ Müller, *So lebten und arbeiteten wir*, p. 29. It was called the Polygon in both Russian and German sources. Polygon is the term generally used to refer to a testing grounds or firing range in Russian. The Germans picked up the term during their time at Kama.

site also bore the same name.⁸⁷ The Soviets would eventually re-code the camp “TEKO,” short for “Technical Courses of the Society for Defense, Aviation and Construction of Chemical Weapons.”⁸⁸ The terms of the agreement for Kama stipulated that the Germans would be in charge of training, but the running of the school would be conducted jointly.⁸⁹ As Voroshilov described it,

The Germans ... will be responsible for general guidance and preparation of a study plan. Our students study under our regulations. These courses should be oriented to improving skills. For our students more important are the problem of tactics, not technical equipment... they should be trained both in tactics and technique.⁹⁰

Because of political circumstances – the crisis which sprung from the resignation of Seeckt and the Manchester Guardian scandal – little progress was made on the construction of the school during the first sixteen months of its existence. This was the “political pause,” triggered by the Junkers scandal. The Soviets demanded the inclusion of the German government in Reichswehr activities in Russia to prevent another such scandal in the future. It took some months for the German army to reach an accommodation with Stresemann and the civilian government and then revise its agreements with the Red Army; this process did not conclude until August 1927.⁹¹ As a

⁸⁷ Habeck, p. 81.

⁸⁸ “Spetsial’naya svodka o sostoanii ‘Tekhnicheskikh kursov Osoaviakhim» [Special Report on the Technical Courses of OSOAVIAKhIM].”

⁸⁹ Gorlov, pp. 75-89.

⁹⁰ “Spravka O Peregovorakh Sovetskoy i Nemetskoy Storony v Otnoshenii Raboty Sovmestnykh Predpriyaty [Memorandum on the negotiations of the Soviet and German sides regarding the joint ventures”] November 1931, 33987-3-375, p. 16-20, RGVA, p. 1.

⁹¹ Zeidler, p. 189.

result, almost no equipment was forthcoming from Germany throughout 1927.⁹² Only with the political crisis put behind them did work at Kama resume in the spring of 1928.

The Reichswehr allocated 500,000 marks towards the refurbishment of Kargopol Barracks and the establishment of a firing range between 1926 and 1928.⁹³ According to Soviet estimates, the Germans spent a total of 1.5 and 2 million marks on the facility before it began operation in 1928.⁹⁴ However, that sum paled in comparison to the more than 20 million marks invested in chemical and biological warfare projects in Russia, and the nearly 22 million marks in aviation cooperation up to that year.⁹⁵ The minimal investment showed, as during these first few months of construction, only a handful of individuals were present at Kama. Major Malbrandt, who had selected the site, along with two assistants, moved to Kazan a few weeks after the conclusion of the secret negotiations.⁹⁶ Throughout 1927, a number of civil and military engineers arrived from Germany, mostly singly or in pairs.⁹⁷ The main task of these early arrivals involved

⁹² Esser, pp. 6-7.

⁹³ Ianis Berzin, "Berzin Report: On Cooperation of WPRA and the Reichswehr," December 24, 1928 in *The Red Army and the Wehrmacht: How the Soviets Militarized Germany, 1922-1933 and Paved the Way for Fascism, from the Secret Archives of the Former Soviet Union*, pp. 68-75.

⁹⁴ "Spravka o Kame [Information about Kama]," 1928, 33987-3C-329, l. 150, RGVA, l. 1.

⁹⁵ "Vereinbarung zwischen der russischen Regierung und den Junkerswerken, [Agreement between the Russian Government and the Junkers Works]" February 6, 1922, RH/2, 1130, BA-MA, pp. 1-5 and Ianis Berzin, "Berzin Report: On Cooperation of WPRA and the Reichswehr," December 24, 1928 in *The Red Army and the Wehrmacht: How the Soviets Militarized Germany, 1922-1933 and Paved the Way for Fascism, from the Secret Archives of the Former Soviet Union*, pp. 68-75.

⁹⁶ "Donesenie nachal'niku osobogo otdela PP OGPU TR vremennogo nachal'nika otdeleniya osobogo otdela Akhmetova [Chief of Special Branch, OGPU Report to Department Head, Special Branch Akhmetov]," April 3, 1933, F.109-15, 1, 18, AFSB-RF-RT, digitized by Bulat Sultanbekov and Sirena Khafizova, reprinted in "Kama na Volge [Kama on the Volga]," *Nauchno-Dokumentalnyi Zhurnal Gazirlar Avazi [Scientific-Documentary Journal Gasirlar Avazi]*, Issue 2, 2005, January 3, 2012, Issue 2, 2005, Accessed January 3, 2012,

http://www.archive.gov.tatarstan.ru/magazine/go/anonymou/main/?path=mg:/numbers/2005_2/04/04_41/

⁹⁷ Ibid. Conrad Bauman, arrived to supervise construction in April 1927 and later became an instructor. The Russians reported the arrival of Georg Hoffmann, a 28-year old engineer, in July 1927; intelligence reports listed him as Director of Production, supervising the German engineers. Hoffmann's deputy, Walter

modifying a pair of agricultural tractors into self-propelled guns for testing and practice. These two models, the Hanomags, were very primitive, but allowed the German engineers to test mounted guns and armored plating.⁹⁸

On the Soviet side, members of the construction team were also present as early as 1926. Unschlikht placed an officer named Kadushin in charge of supervising construction. Within a few months, Kadushin had gotten himself into trouble by refusing to reside at the Kargopol Barracks; he moved instead to a hotel in the city center.⁹⁹ When one of his subordinates denounced him in May 1927, Kadushin was dismissed immediately, officially for “mistakes and impolitic behavior.”¹⁰⁰ He was replaced with a “permanent representative” named Petrechenko, and construction resumed.¹⁰¹ Between December 1926 and July 1929, Kadushin and Petrechenko supervised approximately 400 workers, who “repaired and altered old buildings and constructed new buildings, garages, workshops, etc.”¹⁰²

By the time Kama was fully operational in 1929, there were a total of forty-five Germans at the base including nine women, most of whom were the wives of senior

Schulz, arrived later that year. Also present from the very beginning was a chief mechanic and driving instructor, Paul Lemke. Others trickled in throughout the year to the partially refurbished facilities at Kama. ““Donesenie nachal'niku osobogo otdela PP OGPU TR vremennogo nachal'nika otdeleniya osobogo otdela Akhmetova [Chief of Special Branch, OGPU Report to Department Head, Special Branch Akhmetov].”

⁹⁸ Hanomag is shorthand for Hannoversche Maschinenbau AG, a heavy machinery company that produced the tractors. Josef Vollmer, the early German tank pioneer, apparently supplied the design to Hanomag based on his own work with tanks during the war.

⁹⁹ “Donesenie nachal'niku osobogo otdela PP OGPU TR vremennogo nachal'nika otdeleniya osobogo otdela Akhmetova [Chief of Special Branch, OGPU Report to Department Head, Special Branch Akhmetov].”

¹⁰⁰ “Spetsial'naya svodka o sostoaniy ‘Tekhnicheskikh kursov Osoaviakhim’ [Special Report on the Technical Courses of OSOAVIAKhIM].”

¹⁰¹ Ibid.

¹⁰² Ibid.

officers at the facility.¹⁰³ By this time, the Soviets had a total of 131 staff and 10 students at Kama.¹⁰⁴ A civilian academic mentioned in correspondence as “Nikolai Fedorovich” handled the daily needs of the Russian students. The Soviets also had a party secretary present who tried to prevent too much fraternization between local Russians and the Germans.¹⁰⁵ With a full complement of men and machines, armored warfare coursework commenced in March 1929, with 10 German and 10 Russian students.¹⁰⁶

THE AIMS OF COOPERATION AT KAMA

The objectives of each side at Kama were very different. The Germans lacked the finances or political support for a massive armaments program of the sort initiated by the Red Army in 1929. Instead they sought to expose their officers to actual combat vehicles and conditions in order to formulate tactical and operational doctrine for armored warfare. These officers would also serve as a small cadre capable of teaching armored doctrine to the next generation of practitioners. Otto von Stülpnagel wrote that

[Kama] is... the only place where really positive work on the area of tanks can be achieved. Clear insight into the true worth of the tank, the effect of its weapons, the possibilities for its employment, the tactics to follow, etc., can only be acquired there, with the actual materiel. The most detailed study of foreign

¹⁰³ Ibid. It seems that the Germans who had arrived earlier had been cavorting with local women, as there are complaints in Russian records about “gifts” to local citizens in Kazan by the first wave of German officers. The same report also noted that “from the beginning we’ve seen great efforts by the Germans to communicate with Russians in the city, especially women....with the arrival of wives and a variety of other measures, such communications ceased.”

¹⁰⁴ “Spetsial’naya svodka o sostoaniy ‘Tekhnicheskikh kursov Osoaviakhim’ [Special Report on the Technical Courses of OSOAVIAKhIM].”

¹⁰⁵ Ibid. The Soviets complained about the Germans habit of giving gifts to workers and Soviet students. A paramedic named Smirnov was caught taking “gifts” and selling them on the black market. A 1930 intelligence report noted ominously that “we intend to bring Smirnov to justice as soon as we find a suitable candidate to replace him.”

¹⁰⁶ “Spetsial’naya svodka o sostoaniy ‘Tekhnicheskikh kursov Osoaviakhim’ [Special Report on the Technical Courses of OSOAVIAKhIM].”

literature, the best theoretical reflections and well-prepared experimental exercises with tank mock-up units, can only yield an approximate value.¹⁰⁷

To that end, the Truppenamt planned to send small numbers of its best officers. Visitors and students at Kama in the year 1931 alone included generals or future generals Adam, Keitel, Model, Brauchitsch, Kestring and Manstein; at the time, they held important positions, ranging from the head of the Truppenamt (the second highest position in the German Army in 1931) to chiefs of two of the Reichswehr's four main sections.¹⁰⁸

To fulfill this vision of Kama required the presence of armored vehicles. Small numbers of new prototypes and foreign models would be brought to Kama for that purpose. Further, for the Germans, Kama was the only place they could assemble engineering teams to test and tweak tank prototypes. The corporate presence at Kama was thus of immense importance. The designers and technicians who lived and worked at Kama would manage most of Germany's tank development program in the 1930s. Training, the development of doctrine and the improvement of German technology were the essential elements of German policy at Kama.

Soviet objectives were much broader. The Red Army was confident in its ability to develop armored doctrine on its own and had access to tanks. While they hoped to gain free access to German technical achievements, they had higher estimations of the

¹⁰⁷ Otto von Stülpnagel, "Bericht über meine Reise nach Russland von 16.IX bis 13.X.1930 [Report on my trip to Russia from September 16 to October 13, 1930]," November 12, 1930, RH1/V/14, p. 5, cited in Habeck, p. 136.

¹⁰⁸ Habeck, p. 146; "From Berzin to Voroshilov: About our Relationship with 'Friends,'" November 6, 1931, 33988-3-202, l. 122-124, RGVA, reprinted in Yuri Dyakov, Tatyana Bushuyeva, *The Red Army and the Wehrmacht: How the Soviets Militarized Germany and Paved the Way for Fascism, from the Secret Archives of the Former Soviet Union* (Amherst, NY: Prometheus Books, 1995), pp. 268-269.

ongoing tank developments in Great Britain and the United States.¹⁰⁹ Their larger concerns centered on human personnel. First, the cost of importing armored vehicles, something upon which the Soviet Union depended from 1926 to 1930, was immensely expensive. They sought to wean themselves from foreign dependence through the training of large numbers of engineers and upgrading major factory facilities. Cooperation with Germany, not just at Kama, played a central role in this process.

Second, even as Soviet armored doctrine evolved and reached some consensus by 1929, maneuvers and war games indicated that the Red Army was woefully incapable of carrying out the new operational methods then being devised. In 1931, two years after Triandafillov's proposals had been largely embraced by the RVS, an inspection tour revealed that

the men in the 3rd Detached Tank Regiment 'do not have even the most elementary knowledge of the action of the vehicle [tank] as part of a platoon, or about the tank groups NPP, DPP and DD. For instance, in the 7th Company, they did not even know about the existence of published tank manuals, instructions, and so on.¹¹⁰

The Soviet work at Kama sought to redress the enormous tactical deficiencies of Soviet armored forces, bridging the gap between the increasingly complex and sophisticated notions of senior leaders and the complete inability of lower echelon forces to execute said doctrine. A senior officer at UMM wrote that

The main objective of the UMM-RKKA in the use of "TEKO" was to educate commanders of the Red Army on the design features of the German military vehicles, to examine the process of testing and developing tank technology, to gain knowledge about the methodology of tanker gunnery and tank control instruments and the process of firing in battle, and also to explore questions

¹⁰⁹ "Postavlenie PB [Resolution of the Politburo]," 1928, 33987-3C-329, l. 146-7, RGVA, p. 1-2.

¹¹⁰ Cited in Habeck, p. 199.

regarding the employment of tank units in battle, while simultaneously mastering the technique of driving combat vehicles.¹¹¹

One of the Russian students of Kama put it more simply when he wrote that the role of “TEKO is to use foreign experience to prepare our engineers to build tanks and have our commanders assimilate foreign armored tactics.”¹¹² This meant that, unlike the German side, that the Soviets wanted the largest numbers of officers and engineers possible.

This was one of the major points of contention between Soviet and German sides.¹¹³ The Germans sought to keep the facility small, while the Red Army wanted to expand it and send large numbers of students – both engineers and combat officers – at a time. The Germans offered a number of excuses to limit the growth of the facility. First, they expressed concerns that Red Army “students must master the German language so that they could be usefully be trained.”¹¹⁴ Then, when the Red Army began providing more translators in the classroom, the Reichswehr argued that increasing the numbers of officers enrolled “depends on the number of teachers.” But they did not increase the number of German instructors at Kama.¹¹⁵ It was this contradiction that would lead Voroshilov to angrily tell General Adam during a meeting in 1931 that at Kama “for

¹¹¹ Gryaznov, “O Rabote Kursov TEKO v 1932 Godu [About the Course of Work at TEKO in 1932],” 14 March 1932, 33987-3-375, l. 113, RGVA (#230, Y-RAP), pp. 1-6, p. 1.

¹¹² Braverman, “Dokladnaya Zapiska po Voprosu Postanovki Uchebnogo Dela v TEKO [Documentary Report on Questions on the Content of Training at TEKO],” May 30, 1930, 31811-1-331, L. 106-107, RGVA (#186, Y-RAP), pp. 1-3, p. 1. He recommended the dispatch of more officers and particularly, more engineers, in order to fully exploit the facility. He also recommended hiring two of the German lecturers to teach Soviet military engineers.

¹¹³ “Postavlenie PB [Resolution of the Politburo],” 1928, 33987-3C-329, l. 146-7, RGVA, pp. 1-2.

¹¹⁴ “Zapis’ priema T. Voroshilovim Generala Gammersteina i Polkovnika Kolental’ [Reception and Recording by Comrade Voroshilov of General Hammerstein and Colonel Kolental]” September 5, 1929, 33987-3c-375, l. 1, RGVA, p. 1.

¹¹⁵ “Spravka O Peregovorakh Sovetskoy i Nemetskoy Storony v Otnoshenii Raboty Sovmestnykh Predpriyaty [Memorandum on the negotiations of the Soviet and German sides regarding the joint ventures]” November 1931, 33987-3-375, p. 16-20, RGVA, pp. 1.

three years there are no results.”¹¹⁶ Yet in an earlier conversation, General Hammerstein would tell Voroshilov that “in our opinion, everything [at Kama] is going well.”¹¹⁷ But the Germans paid the costs of Kama, which meant they were able to shape its management. Kama would remain the small, highly technical testing and training ground they sought, rather than the school for large numbers envisioned by the Soviets. In 1932, the Reichswehr would make some accommodation towards the Soviet viewpoint out of concern that the facility might be terminated, but by and large, it was the German side that set the agenda at Kama.

TRAVELING TO KAMA

On New Years’ Day 1932, Reichswehr Lieutenant Hans Joachim von Köppen received some very curious news.¹¹⁸ He was informed via letter that he was being discharged from the Reichswehr with the rank of Captain due to lack of “mental capacity.”¹¹⁹ A model officer and future commander of one of the Wehrmacht’s armored warfare training bases, von Köppen was entirely unfazed by this strange pronouncement. Ten days later, a “civilian” von Köppen received new, secret orders. An identification card arrived, accompanied by orders to “go to the Barracks of the Wachregiment in

¹¹⁶ Ibid, p. 1.

¹¹⁷ “Zapis’ priema T. Voroshilovim Generala Gammersteina I Polkovnika Kolental’ [Reception and Recording by Comrade Voroshilov of General Hammerstein and Colonel Kolental],” September 5, 1929, 33987-3c-375, l. 1, RGVA, l. 1. This quote, although two years earlier than Voroshilov’s exasperated comment, makes clear that the Germans were satisfied with the output of Kama once tanks had arrived for testing: “Our desire is for Kazan to remain as it is today: [gaining] manufacturing experience on one hand, and training on the other.” ¹¹⁷ “Zapis’ priema T. Voroshilovim Generala Gammersteina I Polkovnika Kolental’ [Reception and Recording by Comrade Voroshilov of General Hammerstein and Colonel Kolental],” September 5, 1929, p. 1.

¹¹⁸ Müller, *So lebten und arbeiteten wir*, p. 11.

¹¹⁹ Ibid.

Berlin.”¹²⁰ The orders had an addendum with a stern warning to carefully obey his instructions to the letter.¹²¹ Köppen discreetly arrived later that day, only to discover a number of businessmen and engineers standing “hat in hand” in the barracks to which he had been assigned.¹²² Several other “dismissed” military officers also joined them, as well as two Russian officers.¹²³

This motley group was soon met by a German man in civilian clothing who introduced himself as Hacher.¹²⁴ As the men would later learn, Hacher was the pseudonym of Major Josef Harpe, the director of the secret armored warfare school at Kama. Harpe also managed the “intermediate program” for all Germans being sent to the Reichswehr’s secret base at Kama.¹²⁵ For the next four months, the civilians and “retired” officers took courses on their respective technical subjects to prepare them for their time in Russia.¹²⁶ In addition, a local lawyer, Herr von Leiszt, taught the group the basics of the Russian language.¹²⁷

Beginning in June, Köppen and the other students left the Wachregiment’s Moabit Barracks and made their way to Berlin Zoo Station to depart Germany.¹²⁸ To prevent the Inter-Allied Commission of Control from growing suspicious, the Germans were dispatched over the course of several weeks in groups of three or four. Unfortunately for

¹²⁰ Ibid, pp. 11-12.

¹²¹ The Wachregiment Berlin was a regiment drawn from each of the Reichswehr’s divisions – one company from each. Besides “guarding” the capital, the regiment had extensive ceremonial responsibilities, including publicly marching through the city three times a week with the regimental band.

¹²² Müller, *So lebten und arbeiteten wir*, p. 11.

¹²³ Ibid, pp. 11, 26.

¹²⁴ Ibid, p. 11.

¹²⁵ Ibid.

¹²⁶ Ibid.

¹²⁷ Ibid.

¹²⁸ Ibid.

these travelers, the most direct rail line from East Prussia to Moscow passed through Klaipeda, a strip of formerly German territory which had passed to French administration under the Treaty of Versailles. As Klaus Müller noted from his own experience in 1933, should they have to pass through the customs post there “all of our secrets soon would have been known.”¹²⁹ Instead, each group was given directions to go a different route: some went by boat to Leningrad, while the rest took a variety of train routes through the Baltic States.¹³⁰ After their meandering journeys, von Köppen and the others arrived in Moscow, where they were met by representatives from Moscow Center.¹³¹

The fatigued travelers were brought by their compatriots to Number 7, Khlebny Pereulok, a pleasant Tsarist-era stone building in northeastern Moscow, not far from Vsevolod Meyerhold’s Revolutionary Theater.¹³² Just down the street, at Khlebny Pereulok 19, was the British Mission in Moscow.¹³³ Upon arriving, Lieutenant Colonel Oskar von Niedermayer and his wife offered their guests hot tea. While they drank from their steaming cups, von Niedermayer briefed each man on the journey to Kazan.¹³⁴ He also told them that they would have a few days to explore the city before they left.¹³⁵

¹²⁹ Müller, *So lebten und arbeiteten wir*, p. 30.

¹³⁰ Ibid, p.11.

¹³¹ Ibid. Earlier in the program, the German students destined for Russia had been easy to spot: large group of German officers, dressed in similar “civilian” clothes, had arrived at the train station with identical, numbered suitcases. It frequently proved difficult for the German officers to hide their military bearing; in more than one group photo of the officers playing “tourist” in Russia, the officers all instinctively lined up by height, as they would have on a parade ground. BA-MA/Reichswehr Photo Collections.

¹³² Meyerhold was a famous German-Russian actor and director. He was shot by the NKVD for being a spy in 1939.

¹³³ The main office of Moscow Zentral was directly next to the British Embassy, less than six blocks from the Kremlin. It seems the Germans reveled operating so nearly under the noses of their British opponents. Müller noted that the locations of the German offices may have imperiled the secrecy of the mission, however.

¹³⁴ Müller, *So lebten und arbeiteten wir*, p. 11.

¹³⁵ Number 7 was equipped with a number of guest rooms, apparently, as Müller and Köppen both noted sleeping there.

Niedermayer helped German officers get tickets to the Bolshoi Theater, visit the (now open to the public) Kremlin and take guided tours of the city.¹³⁶ After a few days of playing tourist, Köppen and his peers boarded a sleeper train headed towards Murom, and from there, onto Kazan.¹³⁷ Upon arrival, they were met with a familiar sight: a brand-new, German-made Benz car was waiting to pick them up from the station, driven by a man who introduced himself as “Comrade Ivan.”¹³⁸ Through the cobblestone streets of Kazan, the car rumbled southwards to Kargopol barracks, about eight kilometers south of the train station.¹³⁹

STUDYING AT KAMA

Köppen’s studies, interrupted by several weeks of travel, resumed shortly after his arrival at Kama.¹⁴⁰ The first assignment of the German students was to return to their Russian language studies. To that end, there were two Russian language instructors on the German staff.¹⁴¹ Despite several months of Russian language training, most of the

¹³⁶ Müller, *So lebten und arbeiteten wir*, p.7.

¹³⁷ *Ibid*, p. 11.

¹³⁸ *Ibid*.

¹³⁹ Müller identified the barracks as formerly called the Astrakhanski Artillery Barracks, but Soviet records refer to the facility as Kargopol Barracks.

¹⁴⁰ Incidentally, this was von Köppen’s second trip to Kama. Because of his experience, he was designated commander of the cadets.

¹⁴¹ Spetsial’naya svodka o sostoaniy ‘Tekhnicheskikh kursov Osoaviakhim» [Special Report on the Technical Courses of OSOAVIAKHIM] One of them is a particularly interesting figure. Paul Bernhardt was a Russian-born German from the vicinity of St. Petersburg. He was fluent in Russian, taught Russian courses to German students, and was listed on the staff as a translator. However, apparently the Soviets and Germans had a number of other individuals who performed most of the actual interpretation work in the classes offered at Kama. The Soviets were sure he was a German military intelligence officer. His background in chemical engineering made his appointment as translator even more conspicuous, especially as he had also served as translator at Tomka, the chemical weapons plant. The Soviets noted on his personnel file in 1930 that “apparently, the appointment of Bernhardt is pure espionage.” They also noted that he had considerable influence over the German Director Radlmaier. While instruction was in German, many of the German students seem to have achieved basic proficiency in Russian from their language courses and constant interaction with their Russian peers. More than a few of the officers at Kama reported competency in Russian in their later, wartime personnel evaluations.

instructors naturally preferred to lecture exclusively in German. In addition, per a Soviet requirement in the original agreement, a university professor from Kazan gave the Germans a series of propaganda talks on Stalin's Five Year Plans.¹⁴² After completing these introductory courses Köppen and the other cadets began their armored warfare studies.

The German instructors at Kama divided cadet lessons between theory and practical training. On the theoretical side, students took three courses: tactics, radio technology, and tank mechanics.¹⁴³ Given the lack of expertise in all three areas (because of limitations imposed by Versailles) most of the instructors by 1932 were actually former students who had already spent a year or two at Kama and "having mastered one area of knowledge or another, were then classified as a teacher."¹⁴⁴ The tank mechanics course, first taught by Captain Hans Pirner, focused on memorizing the varieties of tanks, the models of engines, and ammunition types.¹⁴⁵ Pirner and his successors also lectured on the form and function of tank components.¹⁴⁶ Krupp's Johann Hoffmann taught the tank mechanics courses at Kama in 1932 and 1933.¹⁴⁷ He described being an instructor there:

I had a regular teaching hall, and daily, once in the morning and one in the afternoon, I taught theory there; in addition, one morning a week I held a so-

¹⁴² Müller, *So lebten und arbeiteten wir*, p. 13.

¹⁴³ Esser, pp. 8-9. I am indebted once again to Mary Habeck for providing me with a copy of this excellent technical essay.

¹⁴⁴ Müller, *So lebten und arbeiteten wir*, p. 11.

¹⁴⁵ Gorlov, pp. 203-265.

¹⁴⁶ "Verhandlungsprotokoll, Johann Hoffmann, Allied War Crimes Tribunal [Transcript of Proceedings]," p. 4.

¹⁴⁷ *Ibid*, p. 6. Krupp personnel were actually hired as military instructors at Kama. These individuals were entirely separate from the engineering work conducted by other Krupp employees. They wore Soviet uniforms and participated in maneuvers, showing how deeply intertwined the Reichswehr and the major German arms manufacturers truly were.

called “workshop lesson;” that is, I offered hands-on instruction with the vehicles we had there. There were car parts there that I often used as models, engines that were cut-open and rear axle gears, which I then explained and discussed with the students.¹⁴⁸

Tactics class, first taught in 1929 by Friedrich Kühn, centered on lectures, discussions and sand table exercises on the platoon and company tactics of armored units.¹⁴⁹ There was a heavy emphasis on simulations and war gaming, placing officers in the position of a tank commander, usually at the company level. Subjects included “infantry-tank coordination,” “leading tanks in attack against fortifications,” “antitank defenses” and the different roles of infantry support and long range tank groups.¹⁵⁰ Required reading included Ernst Volckheim’s work, as well as French and British field manuals and reports.¹⁵¹ An electrical engineer named Burkhardt had been put in charge of the radio technology courses in 1929, but Harpe transferred him to the workshops to spend more time modifying radios for tank use. Burkhardt was replaced by two other instructors, who lectured on the principles and practicalities of radio communication.¹⁵²

Initially, German and Russian students took these classes together. Neither side wore insignias or rank, both to prevent espionage and also to foster an atmosphere

¹⁴⁸ “Verhandlungsprotokoll, Johann Hoffmann, Allied War Crimes Tribunal [Transcript of Proceedings],” p. 6.

¹⁴⁹ Friedrich Kühn would rise to the rank of Major General and command two panzer divisions in combat in Yugoslavia and Russia. He was transferred from command of the 15th Panzer Division in June 1942 and promoted to head the Wehrmacht’s Tank and Motorized Equipment Inspectorate. He was lucky – the 15th Panzer Division was encircled and destroyed at Stalingrad only a few weeks later. He died in an air raid in 1944.

¹⁵⁰ Ianis Berzin “Tov. Tukhachevskomy, Predstavliau uchebnii otchet no. 2 nach-ka tankovikh kursov v Kazani ob itogakh sovместnoi c “druzyami” uchebi za letnii period, [To Comrade Tukhachevsky, presenting training report number 2 on the conduct of tank study courses at Kazan over the summer period with “friends”], September 13, 1931, 33988-3-205, l. 237, RGVA (#213, Y-RAP), pp. 1-22, p. 4.

¹⁵¹ Müller, *So lebten und arbeiteten wir*, p. 34

¹⁵² The emphasis on radio technology was rare for such an educational institution in 1929, and highlighted the importance the Reichswehr attached to command and coordination.

conducive to open dialogue and learning.¹⁵³ Klaus Müller described the mood of the courses as remarkably “free from restrictive bureaucracy, which meant the possibility of achieving real success in the most serious work...”¹⁵⁴ As the size of classes grew – with more than 100 Russian cadets arriving in 1932 from the Leningrad Armored Warfare School – academic courses increasingly divided along national lines.¹⁵⁵ German instructors continued to teach both groups of students, however. Students also took their “practical” lessons together.¹⁵⁶ To ensure continued good relations between the groups, the two groups of cadets ate together at least once a week in the mess hall.¹⁵⁷

At first, the Russian students at Kama were hopelessly unprepared for the German style of training. N. Yeroshchenko, a Red Army regimental tank commander who attended the courses at Kama in 1931, wrote to Tukhachevsky that the “weak tactical training of the majority of our students forces us to organize last-minute coaching sessions aimed at improving the most basic tactical skills: writing orders, reports drawing diagrams, etc.”¹⁵⁸ German instructors helped them with these skills, although Yeroshchenko thought that it distracted from the more important goal of gaining

¹⁵³ “Rücksprache mit Herrn Ingenieur Franz Böminghaus [Conversation with Engineer Franz Böminghaus],” October 25, 1945, WA 40 B/1350, 0904 (KA).

¹⁵⁴ Müller, *So lebten und arbeiteten wir*, p. 10.

¹⁵⁵ Besides the general interest of the Russian General staff in training as many of their engineers, professors and officers as possible, in 1931, Mikhail Tukhachevsky had taken over the Leningrad Military District. Doubtless, his superintendence of the armored warfare school there meant more students were encouraged to attend Kama for summer courses.

¹⁵⁶ Müller, *So lebten und arbeiteten wir*, p. 28.

¹⁵⁷ *Ibid.*

¹⁵⁸ Ianis Berzin “Tov. Tukhachevskomy, Predstavliaiu uchebniĭ otchet no. 2 nach-ka tankovikh kursov v Kazani ob itogakh sovместnoi c “druzyami” uchebi za letniĭ period, [To Comrade Tukhachevsky, presenting training report number 2 on the conduct of tank study courses at Kazan over the summer period with “friends”], September 13, 1931, 33988-3-205, l. 237, RGVA (#213, Y-RAP), pp. 1-22, p. 2; for Yeroshchenko’s background, Erickson, p. 268.

experience related to the tactics of tanks.¹⁵⁹ Nonetheless, he argued this was a necessary process, as the RKKA officers were finally developing “solid skills and knowledge of tactical work” thanks to both the classroom environment and intensive self-study.¹⁶⁰

Yeroshchenko had less positive things to say about the German method of teaching tank tactics. He wrote that, from the Russian perspective, “every lesson came across full of ambiguities, contradictions and reticence.”¹⁶¹ He did note that “our views on the three tank echelon system in attack – NPP, DPP and DD – they fully share.”¹⁶² As Yeroshchenko made clear, Germany’s armored doctrine lacked the confidence and specificity which Soviet doctrine had achieved by 1930, accounting for some of the vagueness in the classroom. Yet a more important factor was doubtless a clash of military cultures. He noted that the Germans described Soviet armored doctrine as “quite modern, but too schematic and... prescriptive.”¹⁶³ Instead of offering firm conclusions, the German courses instead emphasized initiative, independence and quick thinking. For instance, in one course, Russian officers, upon arriving to the classroom, would be handed a card with a tactical situation and directed to a corner of the room. The officer then had five to six minutes to “assess the situation, make a decision and write orders” to

¹⁵⁹ Berzin “Tov. Tukhachevskomy, Predstavlaiu uchebnii otchet no. 2 nach-ka tankovikh kursov v Kazani ob itogakh sovместnoi s “druzyami” uchebi za letnii period, [To Comrade Tukhachevsky, presenting training report number 2 on the conduct of tank study courses at Kazan over the summer period with “friends”], p. 3.

¹⁶⁰ Ibid, pp. 1-2.

¹⁶¹ Ibid, p. 2.

¹⁶² Berzin “Tov. Tukhachevskomy, Predstavlaiu uchebnii otchet no. 2 nach-ka tankovikh kursov v Kazani ob itogakh sovместnoi s “druzyami” uchebi za letnii period, [To Comrade Tukhachevsky, presenting training report number 2 on the conduct of tank study courses at Kazan over the summer period with “friends”],” p. 11.

¹⁶³ Ibid, p. 5.

address it.¹⁶⁴ There were numerous other simulations, either in the field, on a map, or on a sand table in the tank tactics classes. These usually involved all of the students at once. Yeroshchenko commented, with some surprise, that “the lectures which took place were generally insignificant – only a final analysis.”¹⁶⁵ This was at a time when the seminar format had been eliminated from the main courses at the Frunze Military Academy in favor of lectures.¹⁶⁶

While academic courses could be taught in classrooms, the real purpose of the unique facility at Kama was to provide hands-on experience in tank combat for officers, as well as an opportunity to test new prototypes.¹⁶⁷ The question of procuring tanks was initially a thorny one. The Germans attempted to buy a copy of the MS-1 (*Malii Soprovozhdenii Pervoi*, or small support vehicle #1) from the Soviets, but the latter demurred, unwilling to share their first domestic tank design.¹⁶⁸ In May 1929 the first tanks, prototype German light and heavy tanks based upon specifications drawn up by

¹⁶⁴ Berzin “Tov. Tukhachevskomy, Predstavliaiu uchebnyi otchet no. 2 nach-ka tankovikh kursov v Kazani ob itogakh sovместnoi s “druzyami” uchebi za letnii period, [To Comrade Tukhachevsky, presenting training report number 2 on the conduct of tank study courses at Kazan over the summer period with “friends”],” p. 5.

¹⁶⁵ Ibid, p. 6

¹⁶⁶ N. Varfolomeyev, “Strategy in an Academic Formulation,” pp. 33-47 in *The Evolution of Soviet Operational Art 1927-1991: The Documentary Basis, Vol. 1*, Translated by Harold S. Orenstein (London: Frank Cass, 1995), p. 39.

¹⁶⁷ Kliment Voroshilov, the head of the Red Army, organized a visit by senior members of the Reichswehr in August, 1928. Voroshilov hoped to advance the joint enterprises, some of which, like Kama, had not received the equipment from Germany necessary to reach full operational capacity. The head of this German delegation was Major General (and future Chief of Staff) Werner Von Blomberg. Von Blomberg visited Kama in late August, where he decided to remove several of the staff members, including Malbrandt. However, he was generally impressed by the progress of construction and the work of the German engineers. Based both on his visit and extended discussions with Voroshilov, Von Blomberg wrote a report arguing for the dispatch a number of tank prototypes to Kama as soon as possible. He, like Voroshilov, realized the need for tank prototypes for any progress to be made at the facility.

¹⁶⁸ Zeidler, p. 188. Zeidler claims that the Germans were successful in acquiring Carden-Lloyd Tankettes for Kama in 1927. The Soviet sources suggest this did not happen until later.

Oswald Lutz and Hans Pirner, arrived at Kama.¹⁶⁹ They would be joined by a number of purchased Russian vehicles: a Carden-Lloyd tankette, and two medium Vickers tanks.¹⁷⁰

The arrival of these vehicles enabled, beginning in June 1929, the first formal tank instruction.¹⁷¹ Practical lessons centered on driving, shooting and unit maneuvers. Two former cadets offered shooting lessons for machine guns and tank cannons out on the “Polygon.” The Russian students proved enthusiastic to add an element of realism to their training exercises – they dressed up the shooting range dummies in Polish and Czech uniforms.¹⁷² Less effort was invested in safety at the range. Müller wrote that

it was very embarrassing when a Russian first year cadet, loading a Soeda¹⁷³ Machine gun.... accidentally stepped on the foot trigger; both drums, with 1000 rounds, emptied... In an adjacent factory two workers were hit by the errant rounds- one in the shoulder and one in the thigh.¹⁷⁴

The German officers proved somewhat unsympathetic to the injured locals. Major Ebert, one of the radio instructors, remarked that “when [the guns] start popping, everyone should get out of the way; they know it’s a shooting range.”¹⁷⁵

¹⁶⁹ Esser, pp. 8-9.

¹⁷⁰ “Verhandlungsprotokoll, Johann Hoffmann, Allied War Crimes Tribunal [Transcript of Proceedings],” December 15, 1947, WA 40/6, 452 (KA), p. 4.

¹⁷¹ By summer 1929, the garage inventory had the following at Kama: “seven tanks, four of them in full combat readiness, six cars, four trucks and five motorcycles.” See Bulat Sultanbekov, “Kama na Volge [Kama on the Volga],” *Nauchno-Dokumentalniy Zhurnal Gazirlar Avazi [Scientific-Documentary Journal Gasirlar Avazi]*, Issue 2, 2005, January 3, 2012.

http://www.archive.gov.tatarstan.ru/magazine/go/anonymous/main/?path=mg:/numbers/2005_2/04/04_41/

¹⁷² Müller, *So lebten und arbeiteten wir*, p. 29.

¹⁷³ The Söda machine gun, later known as the MG S2-100. Nicknamed for the design bureau where it was conceived – Rheinmetall’s Sömmerda facility – the Söda machine gun was one of the first post-World War I machine gun designs drawn up by German military industry. As production within Germany was forbidden under the Treaty of Versailles, it was mass-produced in the town of Solothurn across the Swiss border. For more, see Peter Chamberlain and Terry Gander, *Weapons of the Third Reich: An Encyclopedic Survey of All Small Arms, Artillery and Special Weapons of the German Land Forces 1939-1945* (New York: Doubleday Publishers, 1979).

¹⁷⁴ Müller, *So lebten und arbeiteten wir*, p. 29.

¹⁷⁵ Ibid.

Most of cadets' hands-on training focused on learning to operate a tank. As most of the vehicles required five or six men to operate, mastering these machines took weeks of practice. Each student had to master "the skills of driver, tank commander, radio operator and gunner."¹⁷⁶ They then took turns commanding the vehicles, and then small formations of the armored vehicles together. Instructors gave the cadets an examination at the end of the summer, which included maneuvering a tank at night, overcoming various earthen obstacles, and driving through water barriers.¹⁷⁷

The classroom and "polygon" lessons were put to the test in day-long exercises and annual maneuvers. In October 1932, for instance, von Köppen and the other cadets were informed by one of their instructors, Captain Conze, that the inspector of Russian Tank Forces was coming for a visit.¹⁷⁸ Together, they planned a field exercise. Two Russian regiments – one reinforced by the company of Russian cadets at Kama – faced off against each other with the assistance of German engineers and officers.¹⁷⁹ The armored officers, borrowing four of Kama's tank prototypes, were on the offensive, while one of the Tatar regiment, with mock artillery, stood on the defensive. The tanks apparently performed admirably, earning the approbation of the Russian inspector.¹⁸⁰

¹⁷⁶ Gorlov, pp. 219-225.

¹⁷⁷ Sultanbekov, "'Kama' na Volge [Kama on the Volga]." Among the first men to pass this examination were Ritter Wilhelm von Thoma, who would go on to serve as a major-general on the Eastern Front and in North Africa, and Josef Harpe, who would run Kama from 1931 until its closure in 1933. Harpe served as a divisional and corps commander in World War II, before being promoted in 1944 to serve as the commander of Army Group North on the Eastern Front, one of the Wehrmacht's most senior positions. Most of the students who passed this examination in November 1929, returned in 1930 for the spring session, completing their training at Kama by mid-summer. "Personnel File of Josef Harpe," 1945, R242, A 3356, 276 (NARA).

¹⁷⁸ Müller, *So lebten und arbeiteten wir*, p. 29.

¹⁷⁹ Ibid.

¹⁸⁰ Ibid, p. 29.

In appreciation, the Russians organized a military parade for the benefit German officers. First, a regimental band struck up the *Internationale*, which the Germans saluted. After all, as part of the maneuvers, they were wearing Red Army uniforms. The Russian cadets from Kama then hosted a party replete with “caviar, smoked sturgeon, mushroom salad, borscht soup, crimean Champagne and vodka with much drinking and toasts.”¹⁸¹ German officers noted that the company’s political officer ran the event, while the company commander seemed “like a guest at his own party.”¹⁸² There was reason to celebrate: the exercises had been reasonably successful at addressing tactical issues in both armies: coordination between tanks and infantry, management of platoon sized tank units, and the potential power of the tank in the face of antitank defenses.

ADVANCING THE ART OF THE TANK

Engineer Erich Woelfert must have been ecstatic when he heard the news.¹⁸³ His supervisor, Georg Hagelloch, had asked him to travel to Russia to participate in testing of two prototypes Woelfert had helped to design. He would get a chance to see these engineering projects in action for the first time. Woelfert, then 42 years old, was a senior

¹⁸¹ Müller, *So lebten und arbeiteten wir*, pp. 29-30. It is interesting to note that in 1932, the Soviet Union was gripped by the worst famine in Russian history. The state was largely to blame. As many as 8 million Soviet citizens, mostly Ukrainian or Russian, may have starved to death. The city of Kazan was at the edge of the famine-affected zone.

¹⁸² Müller, *So lebten und arbeiteten wir*, p. 29-30. Indicating, no doubt, the power of political officers in the Red Army of the 1930s.

¹⁸³ Besides getting to see his work in action, Woelfert described himself as a travel aficionado in his interview with the Allied Control Commission after the War. He proudly noted that he had sailed the Mediterranean, gone skiing in the Alps, traveled to America and attended the 1924 Paris International Motor Show, besides his work trips to Finland, Russia, Italy and Hungary.

engineer for Krupp in its semi-legal Bureau of Motor Vehicle Construction.¹⁸⁴ Under conditions of great secrecy, he had managed a team in designing Germany's newest tank, the "*Leichttraktor*."

Woelfert had graduated with an engineer's degree from one of Germany's elite schools, the Technische Hochschule in Charlottenburg and immediately gotten a job as a car designer.¹⁸⁵ During World War I, he had worked on military engineering projects including a cutting edge aircraft engine and one of Germany's first tanks. After the war, he had been fortunate to be hired by Krupp AG's design office for motor car engineering.

In 1925, the newly hired Woelfert, his boss Georg Hagelloch, and three other engineers worked for Krupp AG in Essen designing commercial trucks.¹⁸⁶ That was not to last long. The Reichswehr decided in the same year to restart tank design within Germany.¹⁸⁷ General von Volland-Bockelberg, head of the Reichswehr's *Inspektion für Waffen und Gerät* (Inspectorate for Weapons and Equipment, or *IWG*), chose to pursue two separate tank designs.¹⁸⁸ One would be a light tank under 10 tons, the other a heavy tank under 20 tons. The IWG gave priority to the heavy tank. To that end, in 1926, the IWG contacted Krupp AG, as well as Rheinmetall-Borsig and Daimler-Benz, with an

¹⁸⁴ "Rücksprache II mit Herrn Georg Hoffmann [Interview II with Mr. Georg Hoffmann]," December 15, 1947, WA 40/7, 463 (KA).

¹⁸⁵ Erich Woelfert, "Fragebogen, Erich Woelfert, Allied War Crimes Tribunal [Questionnaire]," May 23, 1947, WA40B/1350, 897 (KA). The Technische Hochschule is now known as the Technical University of Berlin. Its illustrious alumni and former faculty include Wernher von Braun and Gustav Hertz.

¹⁸⁶ His superior, Georg Hagelloch, had deep ties to the Reichswehr. Not only had Hagelloch served in the military before and during World War I, but he had also been the assistant head of Krupp's tank development program during World War I.

¹⁸⁷ Esser, p. 7.

¹⁸⁸ Working closely with him were Oswald Lutz and Hans Pinner. Esser, p. 7.

order for a medium tank.¹⁸⁹ The companies were sworn to the strictest secrecy and ordered to use the designation of “Grosstraktor” [heavy tractor] in all communications and financial reports. This was to hide their real purpose, which was clearly illegal under the Versailles Treaty.¹⁹⁰ It was to be bigger, faster and more heavily armed than any previous German tank, weighing sixteen tons, reaching a top speed of over 40 km, and mounting a powerful 7.5 cm cannon.¹⁹¹

To Woelfert, it must have been clear from the moment he saw the specifications that his newest project would violate Germany’s treaty obligations. The Krupp engineers decided not to discuss the subject: one coworker noted “when we started working on building tanks in 1926, we didn’t speak about the Treaty of Versailles.”¹⁹² Woelfert’s superior swore all five men on the Krupp engineering team to secrecy.¹⁹³ At first, the team worked on preliminary designs in Krupp’s car factory, before moving their offices and construction work to “Administrative Building III,” where they could work covertly.¹⁹⁴ They had two years to build the world’s most advanced tank.

Meanwhile, at Kama in 1927, the small Reichswehr engineering team already in place were working on their own experiments. Lacking true tank prototypes with which to work, they decided they would attempt to turn commercial tractors into self-propelled armored guns. The engineers made use of two tractors built by the Hanomag

¹⁸⁹ “Bericht über die Entwicklung von Panzerfahrzeugen bei der Fried. Krupp AG [Report on the development of Tanks by Friedrich Krupp],” August 7, 1945, WA 40 B.1354, 2319 (KA).

¹⁹⁰ Esser, p. 7.

¹⁹¹ Ibid.

¹⁹² Esser, p. 2.

¹⁹³ Ibid, p. 6.

¹⁹⁴ “Verhandlungsprotokoll, Johann Hoffmann, Allied War Crimes Tribunal [Transcript of Proceedings],” Johann Hoffmann,” p. 7.

Corporation.¹⁹⁵ The first attempted modification involved the addition of a 37 mm anti-tank gun mounted on a pedestal, which could only traverse 30 degrees.¹⁹⁶ Mounted on the rear of the tractor was a machine gun. The vehicle itself, a 1922 model, had an engine about as powerful as a riding lawnmower today.¹⁹⁷ On their second attempt, the engineers used a higher powered tractor (with 50 horsepower) and equipped it with a 75mm gun.¹⁹⁸ The move from the 77 mm cannon, a standard gauge for German artillery during World War I, to 75mm, was a permanent one for the Reichswehr.¹⁹⁹

Meanwhile, back at Krupp's headquarters in Essen, under the guidance of Georg Haggeloch, the Krupp engineering team began drawing up preliminary drafts for the *Grosstraktor*.²⁰⁰ By March 1927, designs had advanced far enough to produce a wooden model, which was inspected and approved by the IWG.²⁰¹ Over the summer of 1927, preliminary production began, and by August of the next year, Krupp workers assembled the chassis and installed a BMW V(a) airplane engine as the tank's power plant.²⁰² A second prototype was put together shortly thereafter.

Now there came the great difficulty of testing the vehicles. The Reichswehr wanted to test the prototypes at Kama. Up to 1928, the major technological components

¹⁹⁵ Peter Chamberlin and Hilary L. Doyle, *Encyclopedia of German Tanks of World War Two: A Complete Illustrated Directory of German Battle Tanks, Armoured Cars, Self Propelled Guns and Semi-Tracked Vehicles, 1933-1945* (New York: Arco Publishing Company, 1978), p. 146.

¹⁹⁶ *Ibid.*, pp. 146-147.

¹⁹⁷ *Ibid.*

¹⁹⁸ Gorlov, pp. 203-265.

¹⁹⁹ For more detail, see Herbert Jäger, *German Artillery of World War One* (Ramsbury, Marlborough, Wiltshire: Crowood Press, 2001). The 75 mm gun would become standard on many German vehicles - including the Sturmgeschütz and Mark IV Panzer - by the beginning of World War II.

²⁰⁰ "Reichswehrministerium Vorgang: Gr. 2 [Reichswehr Ministry, Development of the Grosstraktor 2]," May 14, 1935, WA 40/252 (KA), pp. 88-91.

²⁰¹ *Ibid.*

²⁰² *Ibid.*

shipped to the various secret Reichswehr-Red Army facilities in the Soviet Union had been relatively small – airplane engines, disassembled component parts, and laboratory equipment for chemical weapons testing. Besides Krupp’s two prototypes, Rheinmetall and Daimler had their own models. Transporting six 16 ton tanks two thousand miles – secretly, no less – was a new challenge entirely. Continued fears about being caught by the French or British led to a comical attempt at secrecy: the Reichswehr decided to export the tanks to the Soviet Union under the guise of “tractors.”²⁰³ To that end, in September 1928, Krupp began to make external modifications to their *Grosstraktors* to try and make them appear like a commercial vehicle.²⁰⁴ Included in the shipment, just in case, were a number of tractor “plows” to lend the cover story credibility.²⁰⁵ Of course, these “tractors” mounted 7.5 mm cannons, which likely would have given the ruse away, but as it turned out, they avoided detection. In the end, this process took five long months, delaying the shipment to Russia. During the intervening months, the Krupp engineers took the risk of testing driving the vehicle themselves inside Administrative Building III.²⁰⁶ Shortly after this brief but successful test, the vehicle was loaded secretly onto rail cars and shipped to Kazan in June 1929.²⁰⁷

Upon arrival, the tanks were put through their paces. Daimler had designed its own engine for the tank and generally avoided collaborating with the other two firms.

²⁰³ Nekrich, p. 60.

²⁰⁴ Ibid.

²⁰⁵ Ianis Berzin, “Dokladi vaiu “Druz’yami” predstavleni po Kazanskoi i Lipetskoi Stantsyam Opisi [Reporting: Kazan and Lipetsk Station Inventories Presented by "Friends"],” July 29, 1933, Y-183 (MAC-YU), pp. 1-18.

²⁰⁶ Ibid.

²⁰⁷ Müller, *So lebten und arbeiteten wir*, p. 13. Captain Hans Pirner personally accompanied the prototypes from Germany to Kazan.

They had placed their prototype design in the hands of already-famous engineer Ferdinand Porsche.²⁰⁸ But his prototype faced constant failures in 1929. Daimler engineers on site decided that the design flaw in the Daimler *Grosstraktors* could not be resolved.”²⁰⁹

Testing continued on the Krupp and Rheinmetall models. The other two firms were heavily invested in the possible outcome – lucrative contracts and professional pride were on the line. By 1930, Krupp had ten employees living at Kama while Rheinmetall had seven; both teams were tasked with modifying and fixing the vehicles as they were tested.²¹⁰ Some competition developed between the teams: one Krupp engineer reported not being allowed near a Rheinmetall vehicle.²¹¹

Both teams quickly discovered extensive problems with their *Grosstraktors*. The IWG specifications had been well beyond the technical capabilities of engineering at the time they had been placed, and it was quickly discovered none of the four vehicles could meet the Inspectorate’s high standards.²¹² But modifications rapidly improved each vehicle. Hagelloch, the head of the Krupp engineering team, came for a visit in October 1930. He wrote that

²⁰⁸ Esser, p. 58.

²⁰⁹ Müller, *So lebten und arbeiteten wir*, p. 18. Porsche’s failed prototype led to his departure from Daimler in 1928. He moved on to Steyr AG, but that company declared bankruptcy in the Great Depression. Unemployed for several years, Porsche finally decided to start his own consulting firm, which evolved into Porsche SE. In one of those strange twists of fate, the failure of his tank prototype some 2000 miles from Germany on a secret military base led to the invention of the famed Porsche brand. Not that Porsche would avoid future tank development – in part for his work with German tank designs during the war, Porsche was sentenced to 20 months in prison after the war. Daimler would send a new prototype the next year.

²¹⁰ Daimler continued to maintain a team at Kama through 1933 to test their later model Grosstraktor.

²¹¹ “Verhandlungsprotokoll, Johann Hoffmann, Allied War Crimes Tribunal [Transcript of Proceedings],” pp. 4-5.

²¹² “Reichswehrministerium Vorgang: Gr. 2 [Reichswehr Ministry, Development of the Grosstraktor 2],” May 14, 1935, WA 40/252 (KA), pp. 88-91.

due to the driving tests from 1930, we made the following improvements: [the installation of] a new chain to drive the wheels and casters; a change the lever pivot of the drive; improvements to the compressor system; the installation of chilled cast iron sleeves and a new conveyer belt in the gearbox.²¹³

The next two years followed the same pattern: students drove and operated the *Grosstraktors* all summer, engineering staff from each company took careful notes of the results, and then spent the long winter making modifications for the next years' driving tests.

ERICH WOELFERT AND THE LEICHTTRAKTOR

The autumn after Hagelloch's visit, Erich Woelfert finally got his chance to travel to Kama. He had two tasks: to once again examine changes made to the *Grosstraktor*, and also to supervise the testing of his own, new tank prototype. In 1928, the IWG had completed its requested specifications for the second set of prototypes they wanted to test at Kama. Codenamed the *Leichttraktor* [Light Tractor] the model was to weigh between eight and nine tons, mount a 3.7 mm cannon and have a rotating turret.²¹⁴ Given Daimler and Porsche's disastrous performance with the *Grosstraktor*, only Rheinmetall and Krupp received contracts for prototypes.²¹⁵

Captain Hans Pirner, the head of the *Waffenamt Prüfwesen #6: Panzer- und Motorisierungsabteilung* (the IWG's Weapons Testing Bureau Section #6 for Tank and Motor Vehicles – hereafter Wa Prüf 6) travelled to Krupp's headquarters personally to

²¹³ "Reichswehrministerium Vorgang: Gr. 2 [Reichswehr Ministry, Development of the *Grosstraktor* 2]," p. 88-91.

²¹⁴ Esser, p. 38.

²¹⁵ "Betrifft: L.Tr. [Subject: the *Leicht Traktor*]," May 27, 1935, WA 40/252, 92-97 (KA).

brief Hagelloch and Woelfert on the specifications for the new prototype in May 1928.²¹⁶ Hagelloch must have noted great potential in the 35 year old Woelfert to bring him to the meeting, as he soon thereafter promoted Woelfert ahead of several older Krupp engineers to head up the *Leichttraktor* program. From this meeting in May 1928 onwards, Erich Woelfert, now officially Hagelloch's deputy, was the heir apparent to head Krupp's tank development program.²¹⁷

With great industry, Woelfert rapidly put together a preliminary wooden model of the *Leichttraktor*, loosely based on a prototype design from the end of World War I. Pirner reviewed the designs during the summer of 1928, assisting Woelfert in selecting an engine before approving construction.²¹⁸ By October 1928, two prototypes had entered production in Administrative Building III.

The *Leichttraktor* was designed with several new technical elements, including an upgraded tracked suspension and new rubber track, as well as a new and much superior air filter (an alteration made after experiments on the *Grosstraktor*).²¹⁹ Woelfert and the Krupp team decided to wait to install the turret, and instead took the turret-less *Leichttraktor* out to the Reichswehr's motor driving range at Meppen, inside Germany.

²¹⁶ "Die Besprechung mit Wa. Prw. 6 am 26.5.28 in Essen [Conversation with Wa. Prw. 6 in Essen]," May 26, 1928, WA 40/255 (KA), p. 172.

²¹⁷ Erich Woelfert, "Fragebogen, Erich Woelfert, Allied War Crimes Tribunal [Questionnaire]," May 23, 1947, WA40B/1350, 897 (KA).

²¹⁸ Krupp also put Woelfert to work building a commercial version of the Light Tractor – something that could serve as an actual tractor, or truck or something similar. Given the small size of their initial contract with the Reichswehr (somewhere around 230,000 RM), apparently Krupp's board wanted to generate revenue from their investment immediately. Interestingly, Junkers tried something similar with its illegal aircraft work for the Reichswehr, which led to inferior performance, as Junkers made his aircraft low-speed for commercial sales. In Krupp's case, the commercial compromise only came after the prototype had been manufactured, and did not seem to impact performance.

²¹⁹ "Betrifft: L.Tr. [Subject: the Leicht Traktor]," May 27, 1935, WA 40/252, p. 92-97 (KA), pp. 1-5.

Given the supposed development of the *Leichttraktor* for commercial applications, the Reichswehr and Krupp believed that they could quietly road test the *Leichttraktor* within Germany without drawing Allied attention.²²⁰ For three months, Woelfert continued road testing at Meppen. Major changes were made to the tank's suspension and steering.²²¹ On January 14, 1930, the *Leichttraktor* was put through a demonstration at Meppen in front of "authoritative men from the army."²²² The Krupp engineers proudly noted that "the most difficult of tasks were performed with good results."²²³

About a month after the demonstration at Meppen, the first prototype *Leichttraktor* was placed on rail cars and dispatched to Kazan. In May, the second tank was sent. Woelfert's trip followed not long after. Like Reichswehr officers such as Köppen, Woelfert had to travel in great secrecy.²²⁴ He arrived in Kama, met with the Krupp engineers there and watched the *Leichttraktor* perform at the "Polygon." He must have been pleased to hear that of the four *Leichttraktor* Prototypes (the other two being from Rheinmetall), it was one of his own models which proved to have the best performance.²²⁵ Woelfert later noted that the *Leichttraktor* project was the Krupp team's important learning experience in designing tanks: with the *Leichttraktor*, "we gained

²²⁰ "Betrifft: L.Tr. [Subject: the Leicht Traktor]," May 27, 1935, pp. 1-5.

²²¹ Ibid.

²²² Ibid.

²²³ Ibid.

²²⁴ His subordinate, Hoffmann, described that "we would have to provide our post with German stamps to hide the real address and location, and tell our family members only that they could write us in Berlin ... this was characteristic of the level of secrecy." ("Verhandlungsprotokoll, Johann Hoffmann, Allied War Crimes Tribunal [Transcript of Proceedings]," p. 8.)

²²⁵ Müller, *So lebten und arbeiteten wir*, p. 22. The Krupp Light Tanks had managed 534 and 365 kilometers of test driving apiece, while the Rheinmetall prototypes had managed only 382 and 290 kilometers a piece during the summer of 1930.

essential experience, particularly with the engine's machinery and tracked vehicle component parts."²²⁶

Although there were some tensions between the corporate rivals, the IWG's Wa Prüf 6 began to force closer cooperation between Rheinmetall and Krupp beginning in 1930. One of the first instances of this collaboration was Rheinmetall's assistance in installing one of their own turrets onto Woelfert's prototype *Leichttraktor*.²²⁷ There were several consequences to this collaboration: Krupp and Rheinmetall's prototype *Leichttraktors* were mostly identical, except for their suspensions.²²⁸ Both also mounted a 37 mm gun of the variety that German engineers had tested in the Hanomag Tractor I back in 1927.²²⁹ By the end of testing at Kama, Krupp's prototype had a Krupp chassis, a "Daimler-Benz engine... an Aphon- manual transmission, gears from a factory in Friedrichshafen and.... a Rheinmetall turret."²³⁰ The *Leichttraktor* was the product of extensive corporate collaboration, supervised by the Reichswehr.

In addition, the Wa Prüf 6 began to supervise both Rheinmetall's and Krupp's engineering teams more and more closely.²³¹ The Wa Prüf 6, represented by Major

²²⁶ Müller, *So lebten und arbeiteten wir*, p. 22.

²²⁷ "Aktenvermerk über die Besprechung bei der Fa. Krupp on May 22, 1931," June 2, 1931 RH8/I/2674 (BA-MA), p. 134.

²²⁸ Esser, pp. 38-41. Krupp used coil springs while Rheinmetall used leaf springs.

²²⁹ Ibid.

²³⁰ "Bericht über die Entwicklung von Panzerfahrzeugen bei der Fried. Krupp [Report on the development of tanks by Friedrich Krupp AG]," August 7, 1945, WA/41 B. 1350, 2319, 1350 (KA).

²³¹ Besides the *Grosstraktor*, the *Leichttraktor* and the LaS, the Reichswehr tested numerous other armored vehicles. Daimler-Benz, C.D. Magirus and Büssing corporations designed prototype heavily armored personnel carriers and scout vehicles. Each had eight to ten wheels, and was intended to carry a large, domed armored platform to protect the troops inside. German instructors and mechanics tested these extensively at Kama between 1929 and 1930, but funding shortages meant that German officers directed their efforts towards tank development rather than armored cars. The Reichswehr decided to drop the designs, though the SdKfz 231, a six-wheeled personnel carrier which Germany mass-produced during the war, was based on these three experimental designs.

Streich, organized a conference in August 1930, which laid a framework for regular future meetings between Reichswehr and corporate engineers.²³² Between June 1931 and July 1933, Woelfert and Hagelloch would meet with men from Wa Prüf 6 at least 64 times - some of these conferences lasted for days or even a week.²³³ At these meetings, they reviewed reports from the corporate engineers at Kama and made decisions about component changes. Between the 1930 meeting and spring, 1932, the working group decided on 18 major component changes for the *Leichttraktor* alone, representing a fundamental redesign of the vehicle.

THE LaS AND THE TANKS OF WORLD WAR II

It was based on these conversations that Wa Prüf 6 drew up plans for their next generation tank prototype. The goal was to combine the engineering experiences of the *Leichttraktor* with lessons drawn from a British tank tested at Kama – the Carden-Lloyd.²³⁴ The RKKA had imported the British Carden-Lloyd tankettes in 1930, two of

The other type of tank that was at Kama was the Rader-Raupen Kampfwagen M-28. Built by the German-Swedish consortium Merker, engineers drew up initial designs for a treaded tank whose treads could be removed for fast road travel. This vehicle was the product of early German attempts to use Sweden as a base for tank development. Merker produced six prototypes by 1930, one of which the Reichswehr shipped to Kama for testing. The Germans did not like the model, and ended up not pursuing the multi-use chassis the Swedes had developed. The L-30 was the only model at Kama which was not clearly utilized in future designs. The Swedes tried to develop it further, creating a more complicated, lighter version in the L-80, but eventually abandoned the design and purchased tanks from Czechoslovakia. BT White, *German Tanks and Armoured Vehicles, 1914-1945* (London: Ian Allan, 1971), pp. 30-32.

²³² Streich would go on to serve as commander of a Panzer Division under Rommel and win a Knight's Cross. However, he was nearly dismissed for his failure to take Tobruk in 1941. He also served under Guderian on the Eastern Front, though apparently the two men squabbled. Streich made a harrowing escape from Berlin during the Battle of Berlin in 1945 and reached Allied lines. After three years in a Prisoner of War Camp, he was released; he lived into his late 80s.

²³³ "Betrifft: L.Tr. [Subject: the Light Tractor's Development,] 1930-1933, RH/2/2673-2678 (BA-MA).

²³⁴ Ibid.

which it shipped to Kama for its officers' use.²³⁵ The Wa Prüf 6 decided it wanted a tank weighing 6 to 8 tons (about four times as large as the Carden-Lloyd) and capable of speeds of around 40 kmh.²³⁶ On their visits to Kama, Woelfert and Hagelloch both studied the Carden-Lloyd carefully.²³⁷ In 1931 Woelfert was placed in charge of the new project and began work on the vehicle, codenamed "Landwirtschaftlicher Schlepper" (LaS) or "Agricultural Tractor."²³⁸ It was due to be tested during the summer of 1934 at Kama, but events intervened. Hitler's rise to power in January 1933 meant the Reichswehr was free to test vehicles within Germany's borders.²³⁹ In 1938, the Germans dispensed with the codenames, and so Woelfert's prototype "LaS" was renamed the German Mark I Panzer.²⁴⁰

As Woelfert noted in a 1942 memo, "the early studies with the *Grosstraktor* [and] the *Leichttraktor*..." prepared his engineering team to "build the LaS, the first of the German, mass-produced battle tanks."²⁴¹ The Panzer I was the first of a generation of machines which would see combat in World War II. Krupp, Rheinmetall, Daimler, MAN and Henschel AGs built 1,926 Panzer I's between 1934 (when they entered mass production) and 1942.²⁴²

²³⁵ "Verhandlungsprotokoll, Johann Hoffmann, Allied War Crimes Tribunal [Transcript of Proceedings]," p. 5. The T-27 was the Soviet version of the Carden-Lloyd, and entered mass production in 1931.

²³⁶ Müller, *So lebten und arbeiteten wir*, p. 36.

²³⁷ Müller, *So lebten und arbeiteten wir*, p. 36.

²³⁸ "Verhandlungsprotokoll, Johann Hoffmann, Allied War Crimes Tribunal [Transcript of Proceedings]," p. 5.

²³⁹ Müller, *So lebten und arbeiteten wir*, p. 36.

²⁴⁰ Gorlov, pp. 219-225.

²⁴¹ Erich Woelfert, "Panzerkampfwagen bei der Firma Fried. Krupp A.G [Tanks at Friedrich Krupp], January 23, 1942, WA 40/252, KA, p. 86-87.

²⁴² Spielberger, *Die Motorisierung der Deutschen Reichswehr 1920-1935*, p. 415.

The significance of Kama's role in tank development, and specifically the importance of Woelfert's LaS, can hardly be overstated. In fact, both subjects were put on trial. In 1947 American prosecutors brought charges against the Krupp Corporation's board for the use of slave labor and their work illegally rearming the German state. On December 15, 1947, prosecutors in Nuremberg's Palace of Justice interviewed an uncooperative Krupp Engineer named Johann Hoffmann. He had been one of Woelfert's assistants, had worked on armored designs beginning in 1926, and had lived at Kama for two summers.²⁴³ Prosecutors tried to draw forth from Hoffmann an admission that Krupp had prepared Germany for a new war by its activities in Russia with an aggressive line of questioning:

"Is it true, as has been said and described in the evidence submitted in the course of this case, that [Krupp's] LaS-Tank fundamentally laid the basis for the armored tanks that were used in World War II?"²⁴⁴

"I don't remember," replied the hostile witness.²⁴⁵

"Was the LaS Tank considered an important forerunner of the tanks that were actually used in the Second World War?"

"I don't remember that either..."

"You are aware that tanks were used in World War Two, no?"

"Yes."

²⁴³ "Verhandlungsprotokoll, Johann Hoffmann, Allied War Crimes Tribunal [Transcript of Proceedings]," p. 8. Shockingly for a corporate engineer, he had actually served as an instructor to German and Russian students, going so far as to wear a Red Army uniform during maneuvers.

²⁴⁴ "Verhandlungsprotokoll, Johann Hoffmann, Allied War Crimes Tribunal [Transcript of Proceedings]," p. 8.

²⁴⁵ Ibid.

“And that the tank and the wide use of tanks was the basis of the so-called Blitzkrieg Method, was it not?”

“I don’t think you phrased that question correctly.”

Presiding Judge Edward Daly cut in at that moment: “I think we’ll adjourn for the day.”

Notwithstanding Hoffmann’s hesitancy to testify, the Krupp Board was found guilty.

FURTHER DEVELOPMENTS

To fully grasp Kama’s importance to the German Army, it is useful to trace the lineage its vehicles after 1933, when the facility closed. As the Panzer I s first rolled off the assembly line, the Wa Prüf 6, flush with the financial backing of the newly established Third Reich, drew up designs for the two chief combat tanks of the future. The Panzer I was intended for training and to satisfy the immediate needs of the Wehrmacht as it rearmed. But in the long term, it did not fit neatly into the operational concepts of mobile warfare that had developed by 1934.²⁴⁶

Oswald Lutz, Heinz Guderian, Ernst Volckheim and other tank advocates reached the conclusion that two new types of tanks would be necessary to meet Germany’s military needs.²⁴⁷ One design would be thinly armored (relatively speaking) and faster, engineered for penetrating enemy lines and operating in the enemy’s rear. This would be Germany’s primary battle tank.²⁴⁸ The other vehicle would specifically be designed to support infantry and battle enemy artillery and tanks, and as such would have heavier

²⁴⁶ Habeck, p. 226.

²⁴⁷ Walter Spielberger, *Panzer IV and its Variants* (Atglen, PA: Schiffer Publishing, 1993), p. 10.

²⁴⁸ Walter Spielberger, *Panzer III and its Variants* (Atglen, PA: Schiffer Publishing, 1993), p. 8.

armor and slower speeds. The two concepts would evolve into the Panzer III and Panzer IV, respectively. Both prototypes were commissioned by the Wa Prüf 6 on January 11, 1934.²⁴⁹ The future Panzer IV was named the *Begleitwagen*, or support vehicle. Its purpose was to “battle enemy armor and protect the light vehicles from antitank defenses and artillery.”²⁵⁰ Krupp and Rheinmetall were assigned initial contracts to develop prototypes.²⁵¹

Krupp and Rheinmetall engineering teams both noted that the new designs would take years to begin mass production, and as such, the Wa Prüf 6 also decided to begin production on another type of vehicle. To that end, they drew up another set of specifications with Daimler-Benz in July 1934 for its version of the La.S. It was based upon Krupp’s already completed prototype, but with some significant modifications.²⁵² This new tank, the Panzer II, was meant to be a heavier version of the Panzer I, closer in weight to the *Leichttraktors* tested at Kama. It was intended to carry a small 2 cm gun with armored piercing round capability.²⁵³ Daimler (and MAN, to whom the Reichswehr also gave a contract) produced 2,030 between 1934 and 1944.²⁵⁴

One of the central questions of the Wa Prüf 6 at this critical juncture was how to optimize the arrangement of the tank’s crew. Based on British models in the First World

²⁴⁹ Spielberger, *Panzer IV and its Variants*, p. 10; Spielberger, *Panzer III and its Variants*, p. 8.

²⁵⁰ Habeck, p. 226.

²⁵¹ Spielberger, *Panzer IV and its Variants*, p. 10-12.

²⁵² “Verhandlungsprotokoll, Johann Hoffmann, Allied War Crimes Tribunal [Transcript of Proceedings],” pp. 28-41.

²⁵³ Ibid.

²⁵⁴ Ibid. The Daimler engineers, some of whom had lived at Kama, also took the lead with the Panzer III, of which 6,404 were manufactured between 1935-1945. The Panzer IIIs initially used a coil suspension which had been rejected by Krupp for its own Panzer I based on testing at Kama. In 1940, Daimler’s Panzer IIIa’s were all withdrawn due to unsatisfactory performance of their suspensions.

War, the *Grosstraktor* had been designed with a complement of six: a driver, radio operator, two gunners, an “engine warden” and a commander.²⁵⁵ The structure of the tank, with the commander in the center of bow, meant that he also had to operate one of the tank’s machine guns. This turned out to be an awkward division of labor. German officers concluded that “that the leadership of these vehicles was difficult due to the proliferation of crew members.”²⁵⁶

The *Leichttraktor*, the next model to be tested at Kama, drew some inspiration from Russian designs. In particular, it borrowed its turret design and crew layout from the T-28, which in turn borrowed from the British Vickers Mark III medium tank.²⁵⁷ There were four crewmen in the *Leichttraktor*: a driver and radio operator sat in the bow while the commander and gunner sat in the turret.²⁵⁸ However, this meant that the commander had to load the main gun besides commanding; this too was problematic. As neither design proved satisfactory, engineers Hoffmann (Krupp) and Seger (Rheinmetall) began to experiment with new turret designs while stationed at Kama.²⁵⁹

During meetings at Kama in 1931, Hoffmann, Seger and other engineers built a large wooden model of the next generation of *Grosstraktor*.²⁶⁰ Their design had a much larger turret than the previous *Grosstraktor*.²⁶¹ The next year, while visiting Kama, General Lutz officially proposed the development of a medium multi-turreted tank

²⁵⁵ Spielberger, *Die Motorisierung der Deutschen Reichswehr 1920-1935*, pp. 282-286.

²⁵⁶ Ibid, p. 282. This was in general reference to tanks with crews of 6 or more.

²⁵⁷ Spielberger, *Die Motorisierung der Deutschen Reichswehr 1920-1935*, p. 282.

²⁵⁸ Ibid, p. 318. Note: one of the prototypes had only three crew, with no radio operator. But the four-man crew was the primary layout of the *Leichttraktor*.

²⁵⁹ Esser, p. 24.

²⁶⁰ Ibid, p. 37.

²⁶¹ Ibid.

meeting the dimensions of the 1931 wooden model.²⁶² Krupp and Rheinmetall duly submitted proposals some two weeks later, on October 25, 1932.²⁶³ Both included a turret with a gunner, commander and loader sharing the main turret.²⁶⁴

The three-man turret was a major technological advance. The design placed the commander in the turret to observe and issue commands while a gunner and loader handled the actual work of the main gun.²⁶⁵ The Rheinmetall and Krupp prototypes, named the *Neubaufahrzeug V and VI* respectively, were the first German tanks with a three-man turret.²⁶⁶ Rheinmetall completed its prototypes in 1934 and began technical testing, but their primary turret encountered difficulties and were replaced with Krupp's design.²⁶⁷ Despite this technical difficulty, the Wa Prüf 6 decided (even before the *Neubaufahrzeugen* were complete) that the three-man turret was superior to the two-man turrets designed for the Panzer II. As a result, on January 11, 1934, when Wa Prüf 6 issued its specifications for the future Panzer III and IV, both models were to be equipped with the three-man turret structure designed by Krupp and Rheinmetall.²⁶⁸

²⁶² Spielberger, *Die Motorisierung der Deutschen Reichswehr 1920-1935*, p. 334

²⁶³ Ibid. The fact that they were able to submit prototype designs within two weeks indicated how much work had already been done on the next generation tank design.

²⁶⁴ Spielberger, *Die Motorisierung der Deutschen Reichswehr 1920-1935*, p. 341.

²⁶⁵ While innovative, it was not entirely new: it had first appeared on the Char 2C, a heavy French tank first produced in 1921. In 1924, German officers got to see this vehicle, as a short write-up on its design appeared in Ernst Volckheim's *Der Kampfwagen* in its January, 1925 issue "Der neue französische kampfwagen "Type 2 c" in *Der Kampfwagen*, Nr. 4 (Januar, 1925), p. 31.

²⁶⁶ Spielberger, *Die Motorisierung der Deutschen Reichswehr 1920-1935*, pp. 334-340. The *Neubaufahrzeug* was the last of the interwar tank designs to have an innocuous title – it translates as new construction vehicle. Krupp prototypes saw action, serving in the Norway campaign in 1940. They proved hard to build and technically unreliable due to the complicated nature of the three turrets and the poor engine performance of the initial prototypes.

²⁶⁷ Spielberger, *Die Motorisierung der Deutschen Reichswehr 1920-1935*, p. 334-340.

²⁶⁸ Ibid.

Even though enemy vehicles, particularly the French, had some technical superiorities to the Germans, their internal configuration meant that the commander was unable to devote himself entirely to leading his vehicle. The French Char B-1 Bis tank's commander had to load and fire his main armament as well as issue orders. The result was a rate of fire around 2-3 rounds per minute.²⁶⁹ By comparison, the Panzer IV's commander "was free of responsibilities to tend to the gun, and could concentrate on locating targets and coordinating the actions of his tank with that of neighboring tanks or infantry."²⁷⁰ The result was a rate of fire three to five times faster, a potentially decisive advantage. Soviet designs retained the two-man turret where a commander had to load as well as lead. This remained the design even on the famed T-34.²⁷¹

Shortly after the closure of Kama, Woelfert replaced Hagelloch as the head of Krupp's tank engineering bureau.²⁷² Even before he assumed leadership at Krupp, however, Woelfert and his men had begun brainstorming the design of a new medium tank, discussing the construction of an 18-ton tank between trips to Kama, starting in 1930.²⁷³ When the Wa Prüf 6 issued its specifications for the Panzer IV, Krupp quickly put forward a design. Perhaps as a result of their early work, or their careful adherence to

²⁶⁹ Steven J. Zaloga, *Panzer IV vs. Char B1 bis: France 1940* (Oxford, UK: Osprey, 2011), p. 24.

²⁷⁰ Zaloga, *Panzer IV vs. Char B1 bis: France 1940*, p. 24.

²⁷¹ Larisa Vasilieva, Igor Zheltov, Galina Chikova, *Pravda o Tanke T-34: Fakti, Dokumenti, Vospominania I Raznie Tochki Zrenia ob Odnom iz Chudes XX Veka*. The Truth about the T-34: Facts, Documents, Reminiscences and Different Points of View about One of the Wonders of the 20th Century, pp. 114-133.

²⁷² Erich Woelfert, "Fragebogen, Erich Woelfert, Allied War Crimes Tribunal [Questionnaire]." He was very well paid for his work. Based on his Krupp personnel folder and average incomes in Germany, he was making seven times more than the average skilled laborer in Germany in 1936. Income levels drawn from Adam Tooze, *The Wages of Destruction: The Making and Breaking of the Nazi Economy* (New York: Viking Penguin, 2007), p. 141-142.

²⁷³ Erich Woelfert, "Fragebogen, Erich Woelfert, Allied War Crimes Tribunal [Questionnaire]." This was, of course, before Hagelloch retired. But the engineers noted that the project was clearly under Woelfert's control.

Wa Prüf 6 requirements, Krupp's design beat Rheinmetall's. They were given a year to prepare for initial testing.²⁷⁴

With Hitler's ascension to power, Krupp's Bureau of Motor Vehicle Construction began to abandon its secrecy and also massively increased in size. It employed 153 engineers and workers in 1932. By early 1935, it had 473 registered employees.²⁷⁵ As a result, the Krupp engineers who had worked at Kama were rapidly promoted, becoming the senior leaders of Krupp design team. Johann Hoffmann, for instance, was put in charge of the group designing the Panzer IV's steering.²⁷⁶ Overall, the team of engineers who had worked on the *Leichttraktor* stayed together, but as the heads of different engineering teams within the bureau. The entire project, from conception to construction, was managed "under the leadership of Mr. Woelfert."²⁷⁷

The Reichswehr gave the initial contracts for the Panzer IV exclusively to Krupp AG, where the design entered mass production in 1936. As a result of Krupp's monopoly, Woelfert, more than anyone else, dominated the Panzer IV's production and evolution. As Walter Spielberger has noted, until 1942, the vital components of the Panzer IV – the hull, upper body armor and turret – were built exclusively under Woelfert's direct management at Krupp's Essen and Gruson-Werks facilities.²⁷⁸ His supervision involved significant modifications to the design, as the Panzer IV would go through more than

²⁷⁴ Spielberger, *The Panzer Mark IV and its Variants*, p. 10.

²⁷⁵ "Konstruktive Tätigkeit und Weiterentwicklung [Construction Activity and Development]," Undated, WA 40 B/1350 (KA), p. 973.

²⁷⁶ "Verhandlungsprotokoll, Johann Hoffmann, Allied War Crimes Tribunal [Transcript of Proceedings]," p. 2.

²⁷⁷ Ibid, p. 2.

²⁷⁸ Spielberger, *Panzer IV and its Variants*, p. 59.

eight major iterations before 1942.²⁷⁹ Even after 1942, “Krupp maintained a virtual monopoly on turret design until the end of the war.”²⁸⁰

The Panzer IV was the most-produced German combat tank of World War II. Krupp, along with two subcontractors, manufactured 8,817 Panzer IVs from October 1937 onwards.²⁸¹ In addition, the Panzer IV chassis would serve as the basis for self-propelled guns, anti-aircraft tanks, tank destroyers and assault guns, of which an additional 3,828 were made.²⁸² The Panzer IV drew heavily from designs and testing done at Kama: it used a leaf suspension developed for the *Leichttraktor*; it fired a 7.5 mm cannon tested at Kama; it utilized a three-man turret; its power plant was a Maybach engine initially planned for the La.S.²⁸³ Further, its chief designer and many of his subordinates had lived and worked at Kama, gaining vital personal experience in the construction and operation of armored vehicles. Kama thus played a key role in the development of the Panzer IV.

IMPACT OF KAMA ON SOVIET TANK ENGINEERING

The impact of Kama on Soviet tank design was less substantial than in the German case, largely because the Soviets had already initiated a tank construction program of considerable dimensions by 1929, when Kama reached full operation. In 1925, the Zaslavskii Tank Bureau produced the first Soviet-designed tank, the T-16. It

²⁷⁹ See Spielberger, *Panzer IV and its Variants*.

²⁸⁰ Spielberger, *Panzer IV and its Variants*, p. 12-13.

²⁸¹ *Ibid.*, p. 13.

²⁸² *Ibid.*

²⁸³ Erich Woelfert, “Panzerkampfwagen bei der Firma Fried. Krupp A.G [Tanks at Friedrich Krupp], January 23, 1942, WA 40/252 (KA), pp. 86-87.

was little more than an adapted version of the FT-17, a light tank of approximately six tons with a few minor modifications.²⁸⁴ It proved unreliable in testing and was replaced by the T-18 design, which upgraded the engine, chassis and suspension from its predecessor. The T-18 would be the first mass-produced Soviet tank, entering production in July 1927. Over the next eighteen months, 96 of these vehicles were produced.

With the Stalinist Turn, the First Five Year Plan and the realignment of Soviet strategic planning, armored vehicles became a central part of the Soviet industrialization project. Calls for 1,075 tanks in the 1926 armament program were replaced by a plan for 3,500 in May 1929.²⁸⁵ Following the arrival of the T-18 in 1927, Soviet tank production and design ramped up dramatically, leading to a huge number of new prototypes. By 1929, the Soviet tank park would include among its tank designs the “T-19, T-20, T-26, BT-2, BT-5, BT-7, BT-8, BT-IS, T-46-5; the T-17, T-23 and T-27 tankettes; the T-37 and T-38 amphibious models; the T-24, T-28 and T-29 medium tanks; and the heavy T-35.”²⁸⁶

But mass producing the enormous number of tanks envisioned in 1929 was problematic. Soviet industry lacked engineering specialists and industrial facilities capable of mass-producing tanks in great numbers. In 1929, the RVS recorded that the “implementation of existing plans, even in acquiring prototypes for testing, is a difficult task, complicated by the lack of large numbers of experts. In the view of Red Army

²⁸⁴ Zaloga, Grandsen, p. 36.

²⁸⁵ Ibid, p. 43.

²⁸⁶ Richard W. Harrison, *The Russian Way of War: Operational Art, 1904-1940* (Lawrence, KS: University Press of Kansas, 2001), p. 176.

headquarters... it is necessary to attract foreign technical expertise.”²⁸⁷ That expertise would come in three different forms. First, as in other areas, individual experts and businesses would be contracted to provide technical expertise. Among individual experts, there were two senior Germans who began designing tanks for the RKKA. One was Josef Vollmer, pioneer of Germany’s tank program, who was hired by the Red Army in 1929.²⁸⁸ The other was Eduard Grotte, a German tank designer who was brought in on contract from 1930 to 1931.²⁸⁹

Some of the German business arrangements to refurbish military factories has already been noted. The most important for the purposes of tank production was the Kharkov Locomotive Factory (KhPZ) and Leningrad’s Bolshevik Factory.²⁹⁰ These were the two most important tank production facilities in the Soviet Union; not only did they produce the bulk of the country’s armored vehicles prior to 1929, they housed the two most important design bureaus in the country. OKMO, in Leningrad, was responsible for the design of the T-26, Russia’s main interwar tank, as well as the T-28 and T-35. Not only did the Germans assist in the modernization of the factory, but one of OKMO’s chief designers in 1930-1931 was Grotte. The Tank Design Team at KhPZ, formally

²⁸⁷ “Predsedateliu Revoliutsionnogo Voennogo Soveta] [To The Chairman of the Revolutionary Military Council] 18.7.1929, 4-2-504, l. 5, RGVA, p. 1.

²⁸⁸ “Protokol Zasedaniya u Nachal’nika Shtaba RKKA I Voprosy proekta kolesno-gusenichnogo tanka inzh. Vollmer [Minutes from a Meeting of the Chief of Staff of the Red Army and Questions about the project of the wheel-tracked tank of Engineer Vollmer], 31.9.1929, 4-2-503-504, l. 41, RGVA, p. 1.

²⁸⁹ Zaloga, Grandsen, p. 80. Where Vollmer’s designs drew from his experiences in the First World War, Grotte’s were fantastical and hyper-modern. His initial projects were all in the field of “super-heavy tanks,” weighing anywhere from 100 to a stunning 1000 tons. The only one of his designs which was ever built, even in prototype, was the sleek TG-1, but its electrical and pneumatic systems proved far too complicated for mass production in the Soviet Union. The TG-1 would have been among the best armed and armored tanks to appear during the interwar years, but its cost was prohibitive.

²⁹⁰ Zaloga, Grandsen, p. 43.

organized in 1928, handled the design and production of the T-12 and T-24 in the late 1920s, as well as much of the BT series. Under the leadership of Alexander Morozov, the tank design bureau in Kharkov would be responsible for spearheading the T-34 project.²⁹¹ Of equal importance was the assistance of American firms in modernizing tractor and automobile factories, usually for military production.²⁹² German and American firms played a major role in the development of the Soviet tractor and tank industries. German and American businesses modernized five major plants. American firms built two more from scratch. German and American machine tools and factory components were installed in three other factories with foreign assistance.²⁹³ By 1941, the Soviet Union had eighteen major tank production facilities in the country. Thus, 55 percent of Soviet tank production at the start of World War II depended on German and American machinery. And the scale of that production grew enormously. Total Soviet output in 1929 was only 26 tanks. This figure grew to 170 in 1930, then 740 in 1931, rising sharply to 3,121 in 1932.²⁹⁴ From 1933 to June 1941, Soviet industry would produce a stunning 23,386 tanks and armored vehicles.²⁹⁵

Almost all of the tank designs produced in these plants were drawn from Western prototypes, though usually ones that had failed to receive endorsement of the militaries in

²⁹¹ For the best description of the technical evolution of the T-34 project, see Larisa Vasilieva, Igor Zheltov, Galina Chikova, *Pravda o Tanke T-34: Fakti, Dokumenti, Vospominania I Raznie Tochki Zrenia ob Odnom iz Chudes XX Veka [The Truth about the T-34: Facts, Documents, Reminiscences and Different Points of View about One of the Wonders of the 20th Century]* pp. 67-117.

²⁹² Zaloga, Grandsen, pp. 42-44.

²⁹³ Ibid, pp. 43-44.

²⁹⁴ Ibid, p. 108.

²⁹⁵ David R. Stone, *Hammer and Rifle: The Militarization of the Soviet Union, 1926-1933* (Lawrence, KS: University Press of Kansas, 2000), p. 214.

their respective home countries. In 1928, the Red Army purchased light tanks from Fiat and KH-50 models from Czechoslovakia, the latter having been designed by Vollmer. In late 1929, Innokentii Khalpeskii, the head of the UMM, departed on massive worldwide shopping spree to purchase foreign tank designs.²⁹⁶ His largest agreement was reached with the Vickers-Armstrong Corporation on March 11, 1930, in which the Red Army purchased 20 Carden-Lloyd Mark IV light tanks, fifteen 6-ton tanks and fifteen 12-ton tanks for £205,000.²⁹⁷ The Vickers 6-ton model served as the basis for the T-26, which was the most produced tank of the interwar period. More than 12,000 were produced by 1941, or approximately four times the total tank production of all types in Germany between 1918 and 1941.²⁹⁸ The Carden-Lloyd Tankette – which underwent testing at Kama in 1932 and 1933 – served as the basis for the T-27, of which 3,295 were produced.²⁹⁹ The T-28 line combined elements from the German medium tank prototypes at Kama – including a BMW engine – and the Vickers 6-ton.³⁰⁰ Perhaps the most important purchase was a pair of American engineer Walter Christie’s tanks, which had to be purchased as “tractors” due to a ban on military sales to the Soviet Union. Christie’s

²⁹⁶ Habeck, p. 129. Of the eighteen tank production facilities active in the Soviet Union in 1941, two were modernized by German engineers, two – the Stalingrad Tractor Factory and the Gorki Automobile Factory – were built by American firms with American and German machine tools. Three more were modernized under contract with American firms with German and American machine tools. Three others were built by Soviet construction crews, but equipped with German and American machine tools and factory components.

²⁹⁷ “Buying Order Number 549570, Arcos Limited with Vickers Armstrong, LTD,” 15 March 1930, 33987-3c-350, l. 1, RGVA, pp. 1-4. Arcos Limited was a Soviet corporate front to arrange military and industrial purchases in the United Kingdom. Its offices had been raided in 1927 for its role in labor unrest in the USSR. Correspondence in the same file as the one cited above includes back and forth from Voroshilov to Arcos, confirming the degree of control from Moscow. As one might imagine, this large-scale purchase of armored vehicles required the approval of the British government, which granted it before the end of the month. Facing national recession, the British government concluded that Russian gold meant jobs.

²⁹⁸ Zaloga, Grandsen, p. 55.

²⁹⁹ Svirin, p. 148.

³⁰⁰ Zaloga, Grandsen, p. 72.

unique suspension design and sloped armor provided the basis for the Fast Tank [BT] series. The name only became appropriate, however, when the tanks were upgraded with a BMW-licensed engine system.³⁰¹ The Christie chassis would serve as the basis for the T-34 design.³⁰²

As Zaloga and Grandsen wrote, “97 percent of Soviet tank production [through 1940] was of vehicles that were either identical copies of foreign designs or closely related, improved derivatives.”³⁰³ By and large, these drew from British, American and German designs, in that order. Most of the Soviet Union’s tank production facilities also depended on imported German and American industrial equipment. The degree to which Soviet military industry depended on engineers trained by Germany, either at Kama or elsewhere, is difficult to pin down. Given that the rosters of the Russian students at the joint facilities remain in FSB archives that are off-limits to foreign researchers, it will be some time before that question can be answered. Regardless, it is clear that the massive interwar tank production program of the Soviet Union would have been impossible without cooperation from Germany. Kama played a central part in that exchange.

³⁰¹ Zaloga, Grandsen, p. 72.

³⁰² The BT line impressed Liddell-Hart enough to suggest the British government also seek an arrangement with designer Walter Christie.

³⁰³ Zaloga, Grandsen, p. 48. The authors also add that “It is curious that the designs which the Soviets so wisely chose, for their excellent capabilities and ease of manufacture, were in most cases not procured in any numbers by the armies of the countries in which they originated.

*RADIO AND THE BIRTH OF "BLITZKRIEG"*³⁰⁴

Colonel Friedrich Kühn was about to take part in the largest armored battle of all time – up to that point in history.³⁰⁵ His Third Panzer Brigade had crossed into Belgium less than 72 hours earlier. On May 13th, 1940, lead elements of two of his regiments encountered a French armored detachment. Kühn watched as his “light tanks [waited] under cover, the mediums with their hatches open....firing on some thirty French machines moving slowly southwards.” Kühn’s Panzers, mostly light Panzer Is and IIs, were less well armored and armed than their slower, heavier French opponents. But they possessed one critical advantage: radios.

At about 1:00 P.M. a great fleet of Panzers clanked into view over the open Belgian fields. Alone in his Hotchkiss [tank] with his driver Dupont, [French Lieutenant] Le Bel was soon fully occupied working his short 37-mm gun. Within minutes he fired off half his store of one hundred rounds, claiming six enemy tanks hit, some of them immobilized or burning. But lacking radio....he ceased in practice to command his unit from the moment he himself opened fire.³⁰⁶

Kühn’s tanks experienced heavy losses, but had soon outflanked Le Bel’s squadron. Suffering casualties from the air and from heavier German tanks, Le Bel had no choice but to retreat. The German XVIth Corps diary, of which the 3rd Panzer Division was a critical part, noted for the day that “the Germany Panzer arm feels itself superior to the enemy.”³⁰⁷ And radio had played the decisive role.

³⁰⁴ The term is now a contentious one in military history. While the Germans may not have used it, their opponents did. I use it here because the phrase was used repeatedly by the American prosecutors at Nuremberg investigating Kama.

³⁰⁵ Just a reminder to the reader: Colonel Kühn was one of the instructors from Kama introduced earlier. He was now commanding the point of the German spear: the only armored unit within the 3rd Panzer Division, which along with the 4th Panzer Division led the German offensive through the Ardennes. Jeffrey A. Gunsburg, “The Battle of the Belgian Plain, 12-14 May 1940: The First Great Tank Battle,” *The Journal of Military History*, Vol. 56, No. 2 (Apr., 1992), pp. 207-244; p. 232.

³⁰⁶ Gunsburg, p. 234.

³⁰⁷ *Ibid.*

The issue of command and control of tank units began to become apparent towards the end of the First World War. This was particularly true in the French Army, which produced the most tanks of any of the combatant powers.³⁰⁸ To coordinate increasingly large numbers of armored vehicles, the French designed a new communication tank, the FT TSF. A modified version of the FT-17, the FT TSF mounted a large, folding radio antenna attached to an ER 10 Wireless Machine.³⁰⁹ The machine could thus transmit and receive morse code messages from regimental headquarters, improving unit coordination. The FT TSF was introduced at the very end of the war, and as a result, only three regiments were ever provided the radio tank.³¹⁰ And because of communication difficulties between tanks (since only one vehicle in a unit would be equipped with a radio), the FT TSF found its primary function largely limited to that of a mobile observation post.³¹¹ British developments followed similar lines: a number of Mark I tanks were converted to wireless radio vehicles beginning in 1917.³¹² But they, too, were only used in combat on a few occasions. For their part, the German Army did not invest in the development of radio tanks because of the much smaller number of vehicles they had in operation.

After the war, however, the Reichswehr devoted considerable resources towards radio development. It was the single most important technology in the offensive-minded, combined arms doctrines developing in both Germany (and the Soviet Union):

³⁰⁸ This was in part because of the French decision to focus on light tank production, such as the FT-17.

³⁰⁹ Fedoseev, pp. 219-220.

³¹⁰ Fedoseev, p. 220

³¹¹ Ibid, p. 220.

³¹² David Fletcher, *British Mark I Tank* (Oxford: Osprey, 2004), p. 47.

Their [German] policy was essentially the grand strategic offensive, in which aircraft, submarines and tanks – the most potent offensive weaponry to emerge from the Great War – were the key elements. Radio communication greatly enhanced the effectiveness of these weapons systems by providing a means of command and coordination of fast-moving or far-flung formations.³¹³

Radio was at the very center of the technologically-driven, offensive-minded doctrine that originated with Seeckt and fueled the Soviet-German technological pact.

This doctrine had three general strands. First, it depended upon the assumption that changes in technology had restored primacy to the offensive. Second, it emphasized the power of machines – tanks and aircraft in particular – over masses of men. Finally, to operate a technologically modern, offensive-oriented force, German doctrine required the ability to closely coordinate mechanized forces in the air and on the ground. Thus, the single most important technology for the realization of German offensive doctrine was the radio. The Treaty of Versailles did not place limits upon radio technology, so German radio production during the 1920s kept up with, and in some areas surpassed, developments ongoing in Great Britain and France.³¹⁴ However, Versailles handicapped the Reichswehr's ability to test radios in vehicles and aircraft, an essential element of radio development.³¹⁵

The technical problems were immense. Radios in the 1910s were made with crystals that required relative stability. Putting a standard commercial radio into a tank

³¹³ Alan Beyerchen, "From Radio to Radar: Interwar Military Adaptation to technological change in Germany, the United Kingdom and the United States," in *Military Innovation in the Interwar Period*, edited by Williamson Murray and Allan Millet (Cambridge, UK: Cambridge University Press, 1996), pp. 265-299; p. 268.

³¹⁴ Kenneth Macksey, *The Tank Pioneers* (London: Jane's Publishing Co., 1981), p. 119.

³¹⁵ To solve the problem in the air, the Reichswehr used Lufthansa aggressively in the interwar period to test military radios and train new pilots.

would have resulted in these crystals breaking, thus rendering the unit ineffective.³¹⁶ Frequency control proved extremely difficult: due to movement and temperature variation, interwar AM radios were “nearly impossible to tune while in a moving tank.”³¹⁷ The tremendous noise within a tank also rendered voice transmission or reception very difficult. Finally, the locomotion of the tank itself produced interference which made radio use very difficult.³¹⁸ For instance, until 1917, most World War I aircraft equipped with transmission capability needed to trail a radio aerial on a wire 120 meters behind the aircraft in order to effectively communicate with ground radio stations.³¹⁹

At Kama, German engineers worked extensively with tank-to-tank radio communications. Despite the relative strength of the German radio industry, the Reichswehr possessed little familiarity with the challenges posed by wireless tank coordination. It was at Kama that German engineers began their first systematic experiments in tank-to-tank voice communication and control.³²⁰

Klaus Müller wrote after his time at Kama, that “for the guidance of even the smallest armored formation, flawless communication is required.”³²¹ Before the development of the radio, signal flares and flags were the principal means of issuing

³¹⁶ On the development of the radio, see Hugh G.J. Aitken, “De Forest and the Audion,” in *The Continuous Wave: Technology and American Radio, 1900-1932* (Princeton, NJ: Princeton University Press, 1985), pp. 162-249.

³¹⁷ Richard J. Thompson, *Crystal Clear: The Struggle for Reliable Communications Technology in World War II* (Wiley: 2011), p. 10.

³¹⁸ *Ibid.*, p. 24.

³¹⁹ Russell W. Burns, *Communications: An International History of the Formative Years* (London: The Institution of Engineering and Technology, 2004), pp. 406- 417.

³²⁰ Müller, *So lebten und arbeiteten wir*, p. 15.

³²¹ *Ibid.*

orders between tanks, both clearly problematic approaches. The challenge of making a radio work inside a tank led to one amusing exchange; a Reichswehr cadet in 1928 enthusiastically reported to his commander that he had been able to hear someone speaking over a radio during a test ride in a car. The commander was incredulous at the news, replying that “that would only be possible if the radio operator, with his seat and radio, were suspended from the ceiling, hanging in midair.”³²² But he agreed to suspend his doubts. After all, he had not been there. So he gave the cadet an order: “try to do it again; but if you’re wrong, I’ll lock you up for a week.”³²³ Given that there was no note of a successful voice-to-voice transmission reported to the Reichswehr’s Wa Prüf 6 in 1928, it seems the cadet must have suffered for his overexcitement.

After the First World War, the Reichswehr’s Inspectorate of Communication Troops (IN-7) supervised a broad range of radio research, most of it conducted by private companies.³²⁴ German civilian researchers produced a number of breakthroughs in “ultra-short wave” transmission in the early 1920s, which were almost immediately co-opted by the Reichswehr.³²⁵ When the Reichswehr put in its orders for tank prototypes beginning in 1922, they required that every unit have a radio mount, even though the technology for stable transmission from a tank had not yet been developed.³²⁶ Hans Pirner, later an instructor at Kama, was the inspiration behind this remarkable foresight.³²⁷ This marked a

³²² Müller, *So lebten und arbeiteten wir*, p. 16.

³²³ Ibid, p. 16.

³²⁴ Corum, *The Roots of Blitzkrieg*, p. 108.

³²⁵ Ibid.

³²⁶ Müller, *So lebten und arbeiteten wir*, p. 8.

³²⁷ Ibid, p. 8. Krupp engineers noted that Pirner had given them this requirement for the tank prototypes as member of the Reichswehr’s IWG when the Reichswehr placed the orders, likely to their great puzzlement.

major change from the First World War. Instead of having a radio command vehicle, the major German prototypes of the interwar period were all to have their own transmission and reception capabilities, as well as an on-board radio communications officer.³²⁸

There were few major corporate competitors in the field of military radio production in Germany in the interwar period. During World War I, Telefunken was the major German producer of radios.³²⁹ The company's leadership apparently took for granted that Telefunken would win the bidding for any major contracts in the interwar period as well. However, it was an American manufacturing firm, International Telephone & Telegraph Corporation, which would begin developing radios that met the Reichswehr's needs. ITT offered these radios for sale to the Reichswehr through a German subsidiary, Lorenz.³³⁰ To undercut their competition, Lorenz secretly commissioned Engineer Burkhardt, a radio technician bound for Kama, to bring several of their radio modules with him.³³¹ There, Burkhardt installed the first 30 watt transmitter and receiver in the *Grosstraktor* prototype.³³² This radio was designed "like a battleship," sturdy, with a number of modules divided by steel compartments.³³³ This meant the radio

³²⁸This technological optimism would find itself disappointed by the inability of the Reichswehr to develop a capable tank transceiver. Instead, when the Panzer I entered mass production, the German army initially resorted to the World War I expedient of building a command tank (*Panzerbefehlswagen*) with specialized radio equipment. Individual Panzer Is were then equipped with the Lorenz radios discussed elsewhere, which could receive from the command vehicle.

³²⁹Dick W. Rollema, "German World War II Communications Receivers: Technical Perfection From A Nearby Past," *CQ Amateur Radio Magazine*, 8/1980, p. 22.

³³⁰*Ibid.*, pp. 22-23.

³³¹Müller, *So lebten und arbeiteten wir*, p. 16.

³³²*Ibid.*, p. 16. A somewhat amusing addendum to that story: one day, Burkhardt was experimenting with distance transmission, trying to use one of Lorenz's radios to contact a station some 40 kilometers away. Apparently, he was not getting a very strong signal on the ground, and decided adding some altitude might be useful. He spent some time lugging the heavy receiver up into a tree and tried again, but this time lost his balance, fell out of the tree and broke his arm. He spent the rest of the summer comfortably enough in a Russian hospital.

³³³Müller, *So lebten und arbeiteten wir*, p. 23.

was difficult to damage and easy to fix, though it was very heavy. Initially, it was able to transmit and receive voice signals, but only when the tank was stationary. This was not what the Reichswehr wanted.

At Kama, Burkhardt and the other German radio technicians attempted to solve three main problems: improving frequency control, increasing the stability of the radio itself and finding a means of clearly transmitting and receiving a human voice from within the loud confines of a tank.³³⁴ The first was partially remedied by improving the suspension of the tank models being tested.³³⁵ However, this issue would continue to plague German radio development for some time.³³⁶ They addressed the second by testing newer, more stable versions of Lorenz's audion radio. Here, too, they ran into difficulties with transmission, but discovered radios that could at least endure the rigors of tank movement.

To the third challenge, technicians at Kama attempted to improve the clarity of voice transmission and reception, a difficult task within a moving tank. To that end Burkhardt and other technicians at Kama first tried a "lip reader," which was a modified contact microphone. Unfortunately, after considerable experimentation (and apparently much saliva), they decided the device was disgusting and unsanitary.³³⁷ Other work

³³⁴ This is not to say that these three issues were the only ones hindering radio development; it only means that the primary source material indicates that it was on these three issues that the German engineers at Kama devoted most of their time.

³³⁵ Müller, *So lebten und arbeiteten wir*, p. 24.

³³⁶ The issue was solved in the US by the introduction of the FM radio in 1939-1940. Interestingly, FM radios, while broadly adopted within US armored formations, were not uniform throughout the US Army even by 1942. As a result, during fighting in North Africa, infantry units were sometimes unable to communicate with their headquarters or coordinate artillery or air support, and had to ask tank commanders to relay messages on their behalf. Thompson, pp. 52-53.

³³⁷ Esser, p. 3.

proceeded with a larynx contact microphone, but that too proved unsuccessful. In the end, the engineers invented a new set of headphones which “were embedded in large soft brackets and pressed by a spring clip...to the head.”³³⁸ With this headset (along with other developments in radio technology), even in a moving vehicle, radio operators could at least receive voice commands. This meant that as long as a command tank remained motionless, a squadron commander could send orders to his men. While a stride forward for the Reichswehr, this development was on par with British and American radio technology at the end of the First World War.³³⁹

Ianis Berzin, the head of the GRU (Red Army Intelligence) wrote to Marshal Mikhail Tukhachevsky in September 1931 to discuss radio developments at Kama. He noted that tactical studies had been of immense value in revealing the importance of radios. By that year, the Soviets had begun developing their own tank radios at the Red Army’s Institute of Communications based on German experiments at Kama.³⁴⁰ He wrote that “the tactics of the tank vehicles depend on communication. There are three means of such communication: radio, signal flags and tracer shells.”³⁴¹ He noted that the field exercises had clearly demonstrated that radio was the most efficient means of command and control, but that the Red Army had not yet perfected the technology. He ended his

³³⁸ Müller, *So lebten und arbeiteten wir*, p. 24.

³³⁹ In 1918, the American-invented Audion vacuum tube enabled the installation of the first voice-transmission radios on observation aircraft. See Hugh G.J. Aitken, “De Forest and the Audion,” in *The Continuous Wave: Technology and American Radio, 1900-1932* (Princeton, NJ: Princeton University Press, 1985), pp. 162-249.

³⁴⁰ Gryaznov, “O Rabote Kursov TEKO v 1932 Godu [About the Course of Work at TEKO in 1932],” 14 March 1932, 33987-3-375, l. 113, RGVA (#230, Y-RAP), pp. 1-6, p. 2.

³⁴¹ Ianis Berzin, “Predstavliau uchebnyi otchet Nachka tankovikh sovместnoy s druž'yami uchebi za letniy period [Presenting Academic Report Number 2: the Beginnings of Tank Collaboration with "Friends" Training for the Summer Period],” July 29, 1933 (MAC-YU), pp. 1-18.

notes on the tactical exercises at Kazan with a recommendation: “Management and command ought to be given by radio. However, right now, this special radio is still in testing mode and often crashes...”³⁴² But the conclusion that radios were an essential component of command and control – and possible to build – had been firmly established for both the German and Soviet armored forces.

In 1933, when Kama closed, the Soviets supervised the return of all leftover materiel to Germany. They also inventoried the items present. The list of items left by the Germans included more than 120 radio receivers and transmitters, small mobile “satchel” receivers, and five experimental Lorenz transmitters and receivers.³⁴³ The quantity of equipment clearly demonstrated the significance the Germans attached to radio development. The immediate result of Kama was a contract for Lorenz: the Panzer I s manufactured in 1933 used Lorenz FuG 2 and FuG 6 model radios.³⁴⁴ The latter, present in command vehicles, could transmit, while the former could only receive.³⁴⁵ The first generation Lorenz tank radios after Kama were decidedly flawed, but represented the first systematic German attempt to incorporate all armored vehicles into a radio communications network.³⁴⁶

³⁴² Ianis Berzin, “Predstavliau uchebniy otchet Nachka tankovikh sovместnoy s druž'yami uchebi za letniy period [Presenting Academic Report Number 2: the Beginnings of Tank Collaboration with "Friends" Training for the Summer Period],” pp. 1-18.

³⁴³ Ibid.

³⁴⁴ Chamberlin, Doyle, *Encyclopedia of German Tanks*, p. 254.

³⁴⁵ Ibid.

³⁴⁶ Ibid, pp. 254-255. The Wehrmacht would soon upgrade to the FuG 5 and FuG 10, both of which could receive and transmit.

German radio technology for armored vehicles lagged behind the Allies throughout the Second World War.³⁴⁷ However, the considerable strides forward made by the German army during the interwar period in tank radio technology can be credited in part to Kama. It was there that the German military systematically used radios inside armored vehicles for the first time. This work involved the extensive use of radios in maneuvers, in training and in technical testing. The experimentation at Kama also led to the first major tank radio production contract with Lorenz for the Panzer I. Although Kama did not remedy many of the technical issues with the tank radio, it did advance German expertise. When Kühn fought in the Battle of France in 1940, many of his Panzer Is were equipped with the radio sets that had first been tested and developed at Kama.

CONCLUSION

The base at Kazan would begin to face increasing pressure as tensions grew between the Red Army and the Reichswehr. As noted in the previous chapter, on May 30, 1933, the Soviets suspended chemical weapons testing at Tomka. Two weeks later, they did the same for Kama, announcing a temporary suspension of military activity there. The Reichswehr had some interest in maintaining the facilities, as was witnessed by the efforts performed to keep Tomka potentially operational that winter, but by early June it was clear the “chapter of particularly close cooperation should be considered at an end.”³⁴⁸ On July 20, the Soviet side began to “liquidate” the facility, sending ten tanks

³⁴⁷ Thompson, *Crystal Clear*, p. 164.

³⁴⁸ Gorlov, p. 305.

back to Germany, while retaining more than 220,000 rubles' worth of equipment.³⁴⁹ By September 15, the school was closed.³⁵⁰ It is clear that neither side saw much value in continuing cooperation after 1933. The Soviets were well along in their massive tank construction program, while the Germans – with Hitler's seizure of power – were much closer to abrogating the Treaty of Versailles. After the departure of the Germans, Kama was converted into one of the central Soviet armored warfare academies.³⁵¹

In many ways, the Red Army and Reichswehr followed similar paths to Kama. Both states had largely missed out on the tank revolution in the First World War. By 1926, when the two sides reached an agreement about Kama, theorists in each military pitched futuristic visions of all-mechanized armies, drawing from the works of Fuller and others, while fighting general institutional skepticism. It was at this point that they diverged, as the Soviets began mass producing tanks in 1929 thanks to the Stalinist turn. Yet, problematically, they would produce more than 100,000 armored vehicles between 1929 and 1941 without having yet established the mechanisms and tactics to apply Deep Battle.³⁵² In some respects, the ease with which Tukhachevsky won the institutional debate by 1929 meant that his mechanization program was built on a foundation of sand. When Army maneuvers from 1933 to 1937 again and again demonstrated that the “Red Army was not able to implement [Deep Battle] in practice,” confidence in the mechanization program began to shrink.³⁵³ When the Soviet armored forces performed

³⁴⁹ Gorlov, p. 305.

³⁵⁰ Werner von Blomberg, «Perevod, Pis'mo, Minister Reichsvehra [Translation, letter of the Reichswehr Minister],” September 29, 1933, 33987-3c-505-1. 171, RGVA, p. 1.

³⁵¹ Habeck, p. 186.

³⁵² The figure of over 100,000 includes their enormous armored car production.

³⁵³ Habeck, p. 260

very poorly in the Spanish Civil War between October 1936 and February 1937, “deep battle” was effectively discredited in the eyes of Stalin and reactionary Defense Commissar Voroshilov.³⁵⁴ Tukhachevsky found himself forced to recant his views in 1936.³⁵⁵ It did not save him from execution on June 12, 1937, the inaugural bloodletting of Stalin’s military purges.³⁵⁶

The German approach to armored warfare was more pragmatic, and ultimately, more successful. While the Soviets followed a deductive path of doctrinal discovery, the German officer corps approached changes in warfare inductively: “For many German officers, the theoretical nature of the entire debate meant that it was a wasted exercise. Instead they looked for the evidence of actual combat or extensive maneuvers to prove conclusively which side was right.”³⁵⁷ Yeroshchenko described this process in action at

Kama:

If for example, [the Germans] were working on a “fight against an anti-tank gun,” and concluded the need to “zigzag” a tank at a given speed, after testing the tank in action, they would begin technical work in order to meet this tactical requirement and make corresponding changes in the engine, driveshaft, caterpillar treads, etc.³⁵⁸

³⁵⁴ Habeck, p. 260.

³⁵⁵ Ibid, p. 296.

³⁵⁶ It is unclear if the perceived failures of Deep Battle played a role in the purges, but there were more than enough other reasons to suggest it was not a major contributing factor. Stalin had despised Tukhachevsky for almost two decades by 1937, a comment that could be applied to few living Soviet citizens by that time. Perhaps Stalin had preserved Tukhachevsky for his competence, and reversed his estimation. But the destruction of much of the officer corps was not merely over a revision of doctrine; it was Stalin’s attempt to guarantee the political loyalty of the military in an environment of approaching war. As Erickson puts it, “The elimination of the Tukhachevsky group from the Soviet command had been primarily a political operation. The state, personified by Stalin and his apparatus of repression, had reversed the normal order by itself turning Bonaparte and marching on the soldiers. In destroying a potential opposition and crashing this final barrier to untrammelled power, Stalin had done himself a monumental service.” Erickson, p. 474.

³⁵⁷ Habeck, p. 63.

³⁵⁸ Berzin, “Tov. Tukhachevskomy, Predstavliau uchebnii otchet no. 2 nach-ka tankovikh kursov v Kazani ob itogakh sovместnoi s “druzyami” uchebi za letnii period, [To Comrade Tukhachevsky, presenting training report number 2 on the conduct of tank study courses at Kazan over the summer period with “friends”], p. 8.

The tank, more frequently than not, was capable of reaching these new technical requirements, constantly increasing its tactical value. As it did so, the body of evidence in favor of concentrated masses of tanks capable of independent operations grew from experimentation at Kama, foreign maneuvers (particularly British) and then finally the early experiences of war.³⁵⁹ Kama was a critical step in reaching the conclusion that tank technology had finally begun to catch up with the expectations of armored warfare advocates.

What sort of innovations came from the experience at Kama? One major change in German doctrine was a product of this interplay of technology and ideas. Test driving and experimentation at Kama convinced the Germans that improvements in the speed and durability of medium tanks rendered light tanks obsolete. In 1931, Guderian and Lutz both test-drove the light and heavy tanks at Kama. As Müller recalled,

In July [of 1931] Lieutenant Colonel Guderian came to form an opinion as to the question of future developments... after riding in both after riding in both that Leichttraktor and Grosstraktor, he ordered that the Grosstraktor should be developed as quickly as possible.³⁶⁰

Kama convinced Guderian and Lutz that the light tanks were at best a “stopgap,” as they would struggle against other tanks as well as existing antitank defenses. Increasing performance of medium tanks further meant that there was not as big a difference in speed and range as had been theorized in the early 1920s. Thus Germany shifted towards

³⁵⁹ Of course, politics had a major role to play. Just as Stalin backed the enormous mechanization program in large part because it fit his broader economic goals, so too did Hitler’s fascination with high technology prove an important factor: “Tanks and aircraft appealed to him [Hitler], partly because he was fascinated with what were then considered novel forms of warfare, partly because of his interest in contemporary technology.” Dinardo, p. 85.

³⁶⁰ Müller, *So lebten und arbeiteten wir*, p. 27.

the design of medium tanks.³⁶¹ However, the light tank (the LaS) was ready for production while the medium tank was not.

Seeking immediate rearmament, the two men sought a compromise, and decided to order many of the LaS while waiting for the readiness of a new medium tank.³⁶² Through all of these technical experiments, the confidence of the German army in armored warfare was greater in 1933 than it had been prior to Kama. School director Ludwig von Radlmaier wrote that Kama had vindicated Ernst Volckheim: the tank was no longer an auxiliary weapon.³⁶³

Kama operated at full capacity for only four years: 1929-1933. Yet it played a powerful role in shaping the leadership of both militaries' armored forces. By 1933, Kama had graduated 187 Soviet and 30 German officers. The German alumni would play a central role in the development of mobile warfare. The country's top theorists – Volckheim, Pirner, Radlmaier, Harpe, Lutz and Guderian – all either lived at Kama or visited. Engineers who worked at Kama, like Erich Woelfert, Johann Hoffmann and Georg Hagelloch, designed the principal combat tanks of World War II. Important technical developments, such as the three-man turret, were made at Kama. And technicians conducted important work on the tank radio. Kama also had an equally profound role in the development of the Reichswehr's human expertise. Of the thirty German students who completed the full curriculum at Kama, seventeen reached the rank

³⁶¹ Habeck, p. 162.

³⁶² Ibid, pp. 162-163.

³⁶³ Zeidler, pp. 196-197.

of General Major – a divisional commander in the Wehrmacht – or above.³⁶⁴ Most of those who did not reach so high a rank died in combat between 1939 and 1942, usually while serving as battalion commanders in Panzer divisions.³⁶⁵ As intended, they shaped armored doctrine after departing from Kama. The leadership of the Germany's Panzer forces was hugely influenced by the cooperative facility.

Among the Soviets, “a large percentage [were] combat commanders or teachers of the tactical and technical courses at the Armored Warfare University [BUZ], and a smaller percentage were engineering staff (engineers, tankers, gunners, radio technicians).”³⁶⁶ They formed the core of the Soviet armored forces, teaching new armored officers and designing the next generation of tanks. It is hard to say for certainty what role the Russian alumni of Kama played in the Red Army after 1933. The military purges, which swept away so many of the Soviet Union's most competent military leaders, wiped out the cadres trained at Kama. According to the memoirs of a Red Army officer stationed at Kama after the purges, Ivan Dubinsky, everyone he knew who had been involved with Kama had been purged by 1938.³⁶⁷ This included plumbers, janitors

³⁶⁴ Personnel Records, NARA; Gerd R. Ueberschär, *Hitlers militärische Elite: 68 Lebesläufe* (Zürich: Primus Verlag GmbH, 2011); and Franz Kurowski, *Panzer Aces: German Tank Commanders of World War II* (Mechanicsburg, PA: Stackpole Books, 1992).

³⁶⁵ *Ibid.*

³⁶⁶ Gryaznov, “O Rabote Kursov TEKÓ v 1932 Godu [About the Course of Work at TEKÓ in 1932],” 14 March 1932, 33987-3-375, l. 113, RGVA (#230, Y-RAP), pp. 1-6, p. 1; Zeidler, pp. 352-354.

³⁶⁷ “Spetsial'naya svodka o sostoaniy 'Tekhnicheskikh kursov Osoaviakhim' [Special Report on the Technical Courses of OSOAVIAKhIM].” Dubinsky himself served at the Kazan Armored School after the departure of the Germans. He, too, was arrested and tried as a saboteur during the Great Purges. He survived in the camps until Stalin's death and was released. Late in his life, he penned an extensive memoir of his time during the Russian Civil War, the interwar Red Army and the Gulags.

and even waitresses at the camp mess hall.³⁶⁸ Tukhachevsky, who had been a major proponent of Kama, was only the first to suffer in the purges.³⁶⁹

But it can be said for certain that the USSR profited in terms of technological development from Kama. Cooperation played a major role in the accumulation of industrial plant and engineering expertise after 1929. Besides its role in updating the Soviet tank industry and training new engineers, the intellectual exchanges brought about by Soviet-German cooperation left a lasting mark on Soviet tank design. Ivan Gryaznov, deputy head of UMM from 1931 to 1933, credited Kama specifically with an enormous number of technological changes made to Soviet designs:

In reality, we are using today 1) the suspension of the Krupp tank (adopted in the design of our medium tank, the T-28). 2) the welded housings on the German tanks, which are reflected in the use of welded hulls on the T-26, BT and T-28. 3) The arrangement of crew in the bow of the hull in the medium German tanks was borrowed for use in the designs of our T-28 and T-35. 4) Following the model of German observation devices... we have manufactured prototypes of [similar] observation domes for the T-28 and T-35. 5) Periscope sights made on the model of German tank periscopes for the T-26, BT, T-28 and T-35. 6) The idea of ..the independent machine gun, being tested for the T-26, BT, T-28 and T-35. 7) Specifications on the design and construction of German tanks were used for the T-24 and T-28. 8) The electrically powered turrets for the Krupp, Rheinmetall and Daimler medium tanks... 9) The Radios for small and medium German tanks were used for the construction of tank radios by the Red Army Institute of Communications³⁷⁰

Further, he noted that the Red Army had learned “a lot of interesting things on the methods themselves in tactics, the technique of driving vehicles, and marksmanship.

³⁶⁸ Ibid.

³⁶⁹ The same fate seems to have befallen all of the German officers who served at Kama and were later captured by the Red Army on the Eastern Front. Thus far, I have not seen records indicating that any of those who were captured – and there were quite a few – survived the war to return to Germany. However, given the generally high death rates for German POWs, I cannot say whether or not this was an intentional policy.

³⁷⁰ Gryaznov, pp. 1-2.

Thus, in general, the work of TEKO has been of great interest to the RKKA from the point of view of the purely technical and tactical.”³⁷¹ Even if Kama had failed to live up to the grand plans initially conceived by Tukhachevsky and others in 1926, it still played an outsized role in the development of Soviet armored forces.

³⁷¹ Ibid, pp. 2-3.

CHAPTER FIVE – TAKING TO THE SKIES: SOVIET-GERMAN AVIATION

COOPERATION AT LIPETSK

INTRODUCTION

On the cold morning of December 18, 1939, 30-year old *Hauptmann* Wolfgang Falck led his squadron of ME-110 fighter-bombers over the North Sea. It was the time of the so-called “phoney war,” when Great Britain, France and Germany eyed each other warily but did not engage in combat on land. As a result, Falck did not expect much in the way of action. The flight was mostly to keep his men in a high state of training. But suddenly, “the radio came alive, stating that a British bomber force was en route.”¹ Flak from German port defenses began to burst in the distance. As he approached the battle scene, Falck could make out 24 British Wellington bombers, headed in the direction of the port of Wilhelmshaven. Immediately, his squadron swung into action. Falck honed in on a damaged Wellington bomber already hit by flak. Coming up behind it, he squeezed the triggers of his two FF cannons, lacing into the British bomber with 20 mm shells. The bomber’s right engine burst into a cloud of smoke and “he went into a slow spin towards the sea below.”² It was Falck’s fifth observed kill. He was now an “ace.”

But the battle was not over. Despite being short on fuel, Falck was hungry for more action. Chasing down another Wellington, his cannons riddled the British plane

¹ Colin D. Heaton, Anne-Marie Lewis, *The German Aces Speak: World War II through the Eyes of Four of the Luftwaffe’s Most Important Commanders* (Minneapolis, MN: Zenith Press, 2011), p. 181.

² *Ibid.*

with holes. This time, the bomber fought back, pounding his two-engine heavy fighter with .30 caliber Browning rounds. Even while his opponent plunged into the waves, Falck heard a noise. Looking out the cockpit to his right, he could see his right engine was smoking. Turning for home, he recalled years later,

I thought the worst was over.”³ But then “thick smoke [started] coming into the cockpit, so I opened the sliding windows to clear it out. I could breathe with the oxygen, but I could not see anything. ‘Okay,’ I thought, ‘I can make it on one engine, no real problem.’ And then the left engine locked up, and then I smelled fire, and then I learned firsthand that my remaining ammunition was on fire. All of this really started off a bad day, even with two more kills to my credit.”⁴

But the now-ace pilot did not give up. “I found out that all the glider training we had as early pilots paid off, since I was now flying a very heavy smoking and burning powerless glider over the North Sea in winter... I could see the ice below me, and the thought of freezing to death was what kept me in that cockpit as long as possible.”⁵ Out of fuel, with both engines dead, and his plane on fire, Falck just barely managed to squeeze enough altitude out his dying plane to skim the treetops of the German coast and make a “‘dead stick’ landing.”⁶

Seven years earlier, Falck had been a twenty-one-year-old trainee at a secret German flight school in the Soviet Union near the city of Lipetsk. There, for the first time, he had learned the maneuvers that saved his life. Among the other skills he had honed there was flying by night. It had not come in handy in his battle over the North Sea, but it would in his combat career as commander of Germany’s night fighter defense

³ Heaton, Lewis, pp. 181-182.

⁴ Ibid, pp. 181-182.

⁵ Ibid.

⁶ Ibid.

force. When he had practiced combat tactics and night fighting at Lipetsk, Falck had piloted an old Fokker D XIII biplane. Now he flew a big Bf 110 fighter-bomber. Like his training, the Bf 110 also had roots at Lipetsk. It had been commissioned in 1934. The year before, the Reichswehr had completed extensive testing of fourteen different prototypes at their secret facility in Russia. These tests led to new specifications for a range of new combat aircraft, including the two engine heavy fighter piloted by Falck. When it came to creating the aircraft itself, its chief designer drew both engineering expertise and component parts from the testing that had been performed at Lipetsk not long before.

Aviation was the first priority for both the Germans and the Soviets when cooperation began in 1922. While the Junkers' plant at Fili proved something of a disappointment to both sides, the air base at Lipetsk, also known as *Wivupal* (*Wissenschaftliche Versuchs- und Prüfanstalt für Luftfahrzeuge*, or the Scientific Research and Test Establishment for Aircraft) would prove to be a different matter. It was the largest of the Soviet-German military facilities in Russia by an order of magnitude. It remained open the longest, with joint exercises beginning in 1924 and continuing until 1933. Lipetsk had enormous significance in terms of the technical and tactical development of German air power. Except for a short memoir published by one of air fields' participants, most of the work on Lipetsk mentions the facility in passing as part of larger German efforts at rebuilding their air force. Tomka's top secret status makes the lack of work on the subject understandable. But Lipetsk had nine hundred German alumni, including some of the Luftwaffe's most famous pilots. It is also

extremely well-documented in the German archives. One author summed up Lipetsk's influence thus:

By 1930... the Soviets had long since realized that the arrangement was almost entirely one-sided. The Red air forces were gleaning little useful technical or tactical knowledge to offset the many advantages gained by these potentially dangerous, reactionary guests...[And] by 1930, Germany also had little to gain from the Lipetz operation.⁷

But in 1930, the facility did not close. In fact, it expanded considerably. By the end of that year, Lipetsk contained two runways, multiple workshops, research facilities and more than 550 pilots, engineers and mechanics.⁸ This chapter challenges earlier appraisals of Lipetsk's role, and in particular reassesses the Russian and German technical gains made at the facility.

GERMAN AVIATION AFTER 1918

The German Army embraced aviation well before the First World War. In 1908, the Deutsches Heer appointed Pioneer Officer Hermann von der Lieth-Thomsen to run an intelligence group following foreign developments in aviation technology and doctrine.⁹ His supervisor, Erich Ludendorff, helped Lieth-Thomsen receive financial and technical assistance in organizing early German aviation efforts. These followed rapidly upon Thomsen's appointment: in 1909, the Germans held the first aerial maneuvers with rigid

⁷ Robert Craig Johnson, "Planting the Dragon's Teeth: the German Air Combat School at Lipetsk (USSR) 1925-1930," *Chandelle: A Journal of Aviation History*, Issue 3, Number 3 (December 1998), <http://worldatwar.net/chandelle/v3/v3n3/articles/lipetsk.html>. Johnson does note that the facility expanded in 1931 to accommodate additional testing.

⁸ James Corum, *The Luftwaffe: Creating the Operational Air War* (Lawrence, KS: Kansas University Press, 1997), p. 17.

⁹ *Ibid.*

airships. The following year, they began pilot training, initially for aerial observers.¹⁰

Germany had a considerable technical lead in rigid airship design. But in 1912, General von Moltke made the crucial decision – based on Lieth-Thomsen’s suggestions – to “come down firmly on the side of the airplane.”¹¹ This would prove wise.

With the outbreak of war, Germany’s edge in aviation proved crucial on the Eastern Front, as German observer aircraft provided decisive intelligence on the Russian Army during the battles of Tannenberg and Masurian Lakes in late August and early September 1914. As the war progressed and aviation technology improved rapidly, the Germans moved to create a separate air force under Lieth-Thomsen. This was only partially achieved, as both army and navy fought against the formation of a third co-equal branch. Nonetheless, in October 1916, the German Army formed the *Luftstreitkräfte* (usually translated Imperial Air Service, literally, Air Force).¹² From February 1916, the trend in the Imperial Air Service was towards concentration of combat aircraft. The first step was the formation of single-seat aircraft combat squadrons. This was followed by the formation of multi-squadron formations, culminating in the formation of the first *Jagdgeschwader* [fighter air wing]. This innovation proved to be of great value, as through much of 1917, the German Imperial Air Service enjoyed air superiority on both the Eastern and Western Front: for most of that year, British fighter losses outnumbered German ones 3 to 1.¹³ In 1918, as strategic bombing was used increasingly by both sides, the German Air Force conducted a detailed review of Allied efforts against the Ruhr.

¹⁰ Corum, *The Luftwaffe*, p. 18.

¹¹ *Ibid.*, p. 19.

¹² *Ibid.*, p. 25.

¹³ *Ibid.*, pp. 29-34.

They concluded that strategic bombing was largely ineffective; even simple civil defense measures prevented civilian deaths and the loss of productive capacity.¹⁴ This would have a major impact on the post-war doctrinal landscape, which was soon to arrive. At the end of the war, the German *Luftstreitkräfte* was in the best shape of any of the German military's branches: it retained more than 4,500 pilots, large numbers of technically state-of-the-art aircraft, and relatively high morale compared to the other service branches.

But that would soon change. After the war, the Allies began the complete dismantlement of the German air force, as well as placing a moratorium on German civilian aviation for two years. On May 8, 1920, the German Imperial Air Service ceased to exist. The Reichswehr turned over 15,000 aircraft, 28,000 aircraft engines, and 16 Zeppelins to the victorious powers.¹⁵ Lieth-Thomsen soon retired, as did many other senior *Luftstreitkräfte* pilots. But General Seeckt, who had witnessed the utility of air superiority on the Eastern Front, was dedicated to the secret restoration of German air power. He proved to be a fierce advocate of air power throughout the war and after its conclusion. As demobilization proceeded in Germany, Seeckt secretly retained the services of 180 high-ranking *Luftstreitkräfte* pilots, among whom was Helmuth Wilberg. The latter had been one of Germany's first military aviators prior to the war, and risen to command the Fourth Army's aviation wing during the war. One officer described Wilberg as "having the best understanding of the employment of the aircraft in the ground battle" of any pilot in the Reichswehr.¹⁶ Seeckt brought Wilberg into the

¹⁴ Corum, *The Luftwaffe*, p. 41.

¹⁵ Georg Cordts, *Junge Adler: Vom Luftsport zum Flugdienst, 1920-1945 [Young Eagles: From Air Sports to Flight Duty, 1920-1945]* (Munich: Bechtle Verlag Esslingen, 1988), p. 9.

¹⁶ Corum, *The Luftwaffe*, p. 34.

Reichswehr as “chief air advisor,” or head of the thinly veiled German Air Force General Staff.¹⁷ In this role, Wilberg drew up a secret plan for a revitalized German Air Force. It included 1,800 planes and 8-10,000 men to be possessed by the German Army within a decade.¹⁸ Wilberg would serve as Seeckt’s secret chief of the Army Air Staff until 1927, in which position he helped to develop the Reichswehr’s secret programs in Russia.

The post-war study groups organized by Seeckt contained a number of groups dedicated to aviation. Made up of Germany’s top aces, the conclusion of their work defined German air doctrine in the early interwar period. Importantly, they dismissed strategic bombing as ineffective.¹⁹ The goal of any air force was to achieve air superiority first (air supremacy was seen as unrealistic) and use that advantage to support ground forces through intelligence and supporting attacks.²⁰ This view of air power differed dramatically from the air power radicals in England, Italy and the United States who saw air power as a potentially decisive arm. In addition, German air power theorists emphasized many of the lessons of ground warfare: initiative, concentration of mass, and other general principles of combat. But at the same time, like much of the rest of Seeckt’s doctrine, the study group’s lessons, which were incorporated into the F.u.G manual in 1921 were dynamic and non-prescriptive. Its authors went so far as to say that “there are no universally applied principles of air doctrine. Mission and aircraft availability decide

¹⁷ Corum, *The Luftwaffe*, p. 49.

¹⁸ Cordts, pp. 12-13.

¹⁹ Corum, *The Luftwaffe*, p. 74.

²⁰ *Heeresdienstvorschrift 487, Führung und Gefecht der Verbundenen Waffen, Teil I (1921), Teil II (1923)*, [Army Regulations 487: Leadership and Battle with Combined Arms], edited and translated by James S. Corum and Richard R. Muller (Baltimore: The Nautical and Aviation Publishing Company of America, 1998), pp. 74-75.

the matter.”²¹ This flexibility left a great deal of room for innovation in German air doctrine.

Given his estimation of the importance of air power, aviation was Seeckt’s top priority for military cooperation when contact was first made with Soviet Russia. It would become the first branch of direct military cooperation beginning in 1924. But it was not the only avenue that German industry or the Reichswehr pursued in avoiding the treaty terms. German business made the first efforts. As soon as the terms of Versailles became known, the major firms began to move their operations outside of Germany. Junkers and Albatros both moved major production facilities to Russia beginning in 1922. Fokker relocated to the Netherlands (his home country) immediately after the war. Dornier established new factories in Italy and Switzerland, while Rohrbach moved to Denmark. In 1922, the Allies relaxed the terms of the treaty against German civilian aircraft manufacturers, at which point some of these firms shifted at least design work back to Germany. Their work included a number of aircraft designs ostensibly for mail service and civilian passenger aircraft.²² These efforts helped to preserve a nucleus of military aviation expertise within German industry.

Other efforts were made to keep a reserve of pilots ready for future war. Seeckt also saw to it that the Reichswehr retained the services, in one capacity or another, of 200 pilots, of whom 180 were army aviators and 20 were naval aviators.²³ Quite a few of these officers were assigned to cavalry units, alongside general staff officers “hidden”

²¹ Heeresdienstvorschrift 487, p. 77.

²² Corum, *The Luftwaffe*, pp. 76-77.

²³ Cordts, p. 15.

within the ranks of the Reichswehr.²⁴ In addition, a reserve of pilots was maintained through the formation of aerial sports groups. These clubs, flying unpowered gliders, taught the very basics of flight to a new generation of young men.²⁵

In addition, the Reichswehr took advantage of civilian aviation. After the First World War, the Weimar Republic had two partially state-owned airlines: Aerolloyd AG and Junkers Luftverkehr AG. The two merged in 1926 to form Luft Hansa. Its leadership was taken over by former *Luftstreitkräfte* ace Erhard Milch, who by 1929 had frozen out the other board members.²⁶ Milch, who was only 33 years old in 1926, was an ardent advocate of rearmament, and used his position to keep former Imperial Air Service pilots trained. He would also secretly join the Nazi Party in 1929, despite being half-Jewish.²⁷ In his position as head of Luft Hansa, Milch would develop a network of overseas subsidiaries where he could dispatch former military pilots to keep them in good training. To that end, Milch would also buy a stake in Deruluft, the Soviet-German airline, and co-found a regional airline in South America, *Syndikato Condor*. Furthermore, he invested in German aircraft design, promoting the development of a number of “civilian” designs that would prove to be of military utility, particularly fast “mail planes” that could be converted to fighters. Luft Hansa depended upon large subsidies from the state

²⁴ “Reichswehrministerium, Nr. 722/20 Stab vom 10.2.1920,” February 10, 1920, RH/2/2280, p. 175, pp. 1-2.

²⁵ Cordts, pp. 19-27.

²⁶ Ibid, pp. 12-13.

²⁷ His father, an army veteran, was Jewish. Milch would be among the senior military members of the Nazi machine that came to power in 1933, so a fable was invented that his mother had had an affair with an Aryan. He would be promoted to Field Marshall in 1940 and remain in positions of prominence through 1945. He would be convicted of war crimes at Nuremberg after the war. Samuel W. Mitcham, *Eagles of the Third Reich: Men of the Luftwaffe in World War II* (Mechanicsburg, PA: Stackpole Books, 1997), pp. 8-9.

throughout these years. Milch used bribery and political connections on the far right to guarantee the continual flow of these funds.²⁸ During the 1932 presidential campaign, Milch revealed his political loyalties by offering Hitler free flights on Luft Hansa.²⁹ Milch played a significant role in maintaining the flight personnel, and to a lesser degree, military industrial resources, necessary for rearmament.³⁰

All of these measures proved insufficient for Seeckt's vision of cadre development. Luft Hansa and its few affiliated civilian schools produced some pilots, but they lacked combat training. Most of the pilots Milch hired were World War I veterans, already in their thirties or forties. Younger pilots were needed. But efforts to expand the civilian programs in Germany in the late 1920s proved too difficult, as the number of officers made it "increasingly difficult to maintain outward camouflage."³¹ While pilot and observer training could be conducted in Germany, "the training of fighter pilots... was not possible in Germany."³² The Soviet-German partnership was the solution.

²⁸ Mitcham, p. 9.

²⁹ Ibid.

³⁰ Head of the Red Air Force Alksnis would make clear how important Luft Hansa was to secret German rearmament plans. In a meeting in 1932, Alksnis "emphasized that he attached particular importance to dispatching Red Air Force commanders to Germany to learn about the organization and technical work of Lufthansa." "Protokoll der Besprechung zwischen Herrn Alksnis und Herrn Molt am 26.3.1932 in Mo. [Minutes of a meeting between Herr Alksnis and Herr Molt on March 26, 1932 in Moscow]," March 26, 1932, RH12/1/60, 63-71, BA-MA, p. 8.

³¹ Wilhelm Speidel (writing under the "pseudonym" Helm Speidel), "Reichswehr und Rote Armee," in *Vierteljahrshefte für Zeitgeschichte*, Quarterly Journal for Contemporary History, Issue 1 Number 1/1953, p. 21.

³² Speidel, p. 21.

THE SOVIET AIR FORCE, 1917-1924

Aviation in Russia had a brief but important history before World War I. Unlike Germany, Imperial Russia lacked a domestic aviation industry. The Russian Army deployed a handful of aerial reconnaissance balloons during the Russo-Japanese War, but institutional problems and industrial weaknesses during the first decade of the twentieth century handicapped broader efforts at military aviation. As a result, the Russian Army was forced to send officers to France for pilot training prior to the First World War. They returned home in 1910 to open the first two flight schools, outside of Leningrad and in the Crimea.³³ The Russian Army also began to acquire a large and disparate range of military aircraft from France and Great Britain. The first Russian-designed combat aircraft put into action was Igor Sikorsky's Ilya Muromets 4-engine bomber. It entered production in 1913.³⁴ By 1914, the Russian Army had the most military aircraft of any of the warring nations with 263. But nearly all of them were obsolete or even unsafe designs. Further, Russia lacked the infrastructure necessary to maintain the aircraft it did have.³⁵

When the war began, none of the planes of any nation were yet equipped with weapons, so Russian aviators were given machine pistols to fire at opposing aviators. Initially, Russian aviators found themselves outclassed by German and Austrian-

³³ *Voенно-Vosdushnie Sil [Air Force]* in *Sovetskaya Voennaya Entsiklopedia* [The Soviet Military Encyclopedia] (Moscow: Voenizdat, 1980), edited by Andrei Antonovich Grechko. Available through *Voennaya Literatura* [Military Literature] Digital Library, p. 245.
<http://www.troshka.ru/militera/enc/enc1976/index.html>

³⁴ While their operational utility was somewhat limited given the extremely small numbers produced (only twenty in the first two years of the war), they proved very difficult to shoot down.

³⁵ *Voенно-Vosdushnie Sili [Air Force]* in *Sovetskaya Voennaya Entsiklopedia*.

Hungarian planes, in large part because the lack of a domestic aviation industry and spare parts shortages meant Russian fliers were nearly always in inferior and often mechanically problematic aircraft. The Russian Imperial Air Service did have one remarkable claim to its credit in the early days of the war. In August 1914, famed Russian pilot Peter Nesterov rammed an enemy aircraft, marking the first air-to-air “victory” during the First World War. Unfortunately, this also resulted in Nesterov’s death.

In 1915, the Russian Army moved to alter the organizational structure of their air force, removing it from the Army’s Engineer Corps and forming the more independent *Imperatorskii Voенno-Vosdushniy Flot’* [Imperial Russian Air Service]. With the shift towards a new air force structure came new formations: Russian aviation was concentrated into squadrons, then groups, and eventually fighter wings. And like their German opponents, each fighter wing was subordinated to a field army headquarters, operating across a broad front.

Generally, Russian aviators faced even greater challenges than their foreign counterparts. Stunningly, when the war ended, the Imperial Russian Air Service had not yet begun producing synchronized machine guns – which could fire through the propeller of an aircraft – except on a few prototypes. In Germany these devices were universal in fighter aircraft by the end of 1915. This technical disparity made it nearly impossible for a Russian aviator to bring down a German fighter. While the historiography on the Imperial Russian Air Force is thin, one statistic indicates the short life spans and inferior

equipment of Russian aviators: the top Russian ace of the war, Alexander Kazakov, had only twenty kills, the fewest of any combatant nation in Europe other than Turkey.³⁶

In the aftermath of the October Revolution, the Soviets inherited 1,116 aircraft and 600-some spare engines. However, most of these were obsolete or in poor shape. On December 20, 1917, the Soviets established the All-Russian Collegium for Air Power. Trotsky, witnessing the power of an air attack against enemy ground positions during the Kazan campaign, reorganized Soviet air power into the Main Department of the Air Force in September 1918.³⁷ Under Trotsky's further reforms, each front soon had attached squadrons. He also made greater efforts to develop infrastructure to support the development of Soviet air power. For instance, in December 1918, the country's top aviation expert – the elderly Nikolai Zhukovsky – became head of the country's first aviation research lab, the *Tsentrallyy Aerogidrodinamicheskii Institut* [Central Aerodynamic Institute, or TsGASI].³⁸ But these changes failed to alter realities on the ground. By the end of the first year of the Civil War, the Red Army had only 255 operational aircraft. At the height of the action in the late fall of 1919, the Red Army had fewer than 77 total aircraft.³⁹ Aviation performed a somewhat larger role during the Polish-Bolshevik War than during the Civil War, but by that war's end, the Red Army

³⁶ At least one of Kazakov's kills involved ramming. By contrast, the top ace for Germany had 80 kills; France's best had 75; Canada's 72; Britain's 61; Australia's 47; Belgium's 37; Austria-Hungary's 35; Italy's 34; America's 26 (in only six months of combat); New Zealand's 25; and Serbia's 22. Turkey's aviation wing was almost non-existent during the war and commanded by German officers, which explains its lack of combat aces.

³⁷ Robert Jackson, *The Red Falcons: The Soviet Air Force in Action, 1919-1969* (Brighton, UK: Clifton Books, 1970), p. 12.

³⁸ *Voenna-Vosdushnie Sili* [Air Force] in *Sovetskaya Voennaya Entsiklopedia*,

³⁹ "Spravka o Vosdushnogo Flota Rossii," July 26, 1925, 4-2-14, l. 1, RGVA, p. 1.

fielded fewer than 43 aircraft, most of them captured from the Whites in the closing days of the Civil War.⁴⁰

In 1924, with the major reform of the Red Army under Mikhail Frunze, the Red Army was again reorganized as the *Voенно-Vosdushniy Sil RKKA* [Air Force of the Red Army, or VVS]. Appointed to head this new organization was Peter Ionovich Baranov, a 32-year-old army veteran.⁴¹ Baranov had little experience with aircraft. He was deeply interested in technology, though, having also served as commander of the Red Army's armored forces. He also enjoyed considerable political clout, eventually serving on Communist Party's Central Committee. Until 1931, Baranov would remain in charge of the VVS. The challenges he faced were similar to those faced by Fishman in VOKhIMU. Russia lacked all of the other vital components of an air force: aviation industry, engine production facilities, large numbers of skilled pilots, training facilities and even airstrips. From the end of the Russian Civil War until 1924, there were only two operational flight schools in the entire Soviet Union.⁴² Germany's aviation achievements during the First World War had not escaped the notice of the young Soviet Air Force commander. Cooperation with Germany offered solutions to both the immense training and technical issues plaguing the Red Air Force. As it would turn out, such cooperation would help to spur the Soviet Union's "Golden Age of Aviation." By 1933, the VVS was the largest, best equipped air force in the world.

⁴⁰ ⁴⁰ "Spravka o Vosdushnogo Flota Rossii," July 26, 1925, p. 1.

⁴¹ A note on how poor the air forces and services of the Soviet Union remained in 1924: Trotsky, upon hearing news of Lenin's death, hurried back to the capital – but by train, not by plane.

⁴² "Spravka o Vosdushnogo Flota Rossii," July 26, 1925, p. 1.

THE FIRST STEPS TOWARDS COOPERATION

In late 1922, Junkers had agreed to take over management of the Fili Plant. It began producing aircraft two years later. Given the total lack of aircraft production in Russia, this project was of immense importance to Baranov and the VVS. Fili alone consumed about 10 percent of the entire Red Air Force's annual budget in 1925.⁴³ In the meantime, however, Seeckt, Wilberg, Trotsky and Baranov were all interested in moving towards direct cooperation in military aviation. On June 9, 1924, Ambassador Brockdorff-Rantzau and Trotsky met in Moscow to discuss the possibility of dispatching aviation "consultants" to help train Soviet pilots and technicians. An agreement was duly reached and in August 1924, seven German officers departed for the Soviet Union.⁴⁴ Upon arrival in Moscow, they were given Red Army uniforms and ranks, and dispatched to VVS facilities across Russia.⁴⁵

The roles of these consultants varied widely. Two officers served in advisory capacities within VVS training facilities. Five others served as technical trainers within design bureaus, workshops, and factories. The group's leader, Martin Fiebig, was an experienced pilot who had risen to command a bomber wing during World War I.⁴⁶ His

⁴³ "K Spravke po assignovanyam 24-25 goda I namechennim potrebnim assignovaniyam na 25-26 god krasnomu vozduzhnomu flotu SSSR [Inquiry into Appropriations for the 1924-1925 year and projected appropriations requirements for the 1925-1926 year for the Red Air Force of the Soviet Union]," July 7, 1925, 4.2.14(2), l. 1, RGVA, p. 1.

⁴⁴ For the first two years of the group's existence, they were called "Gruppe Fiebig," but in 1925, the group also began to be referred to as "Gruppe Schröder," after the leader of the engineering team. Gorlov states, erroneously, that the group was only referred to by the latter name. "Archivist's Note," RH2/2920-2942/81, 1, BA-MA, p. 1.

⁴⁵ Zeidler, p. 109.

⁴⁶ After 1926, Fiebig followed the course of many other German Air Force veterans and joined Lufthansa. He was called back to active duty to begin training pilots in 1934. In 1941, he was responsible for managing the terror bombing of Belgrade. During the Battle of Stalingrad, he was responsible for the German VIIIth Air Force based just outside the city. In 1943, having escaped encirclement he would be

task was to provide advice on the management of the Soviet flight schools at Smolensk and Vitebsk, as well as helped to establish the Soviet's first night flying courses.⁴⁷ In 1925, he transferred to the Zhukovsky Air Force Engineering Academy, where he commented on course instruction, gave occasional guest lectures, and provided advice on reformulating the curriculum.

Given that the VVS had so short a history and also suffered from massive material shortages, it was not perhaps surprising that it was in a very poor state when Fiebig arrived. His descriptions of the Soviet Air Force Academy were withering. Training courses there were very brief, with each officer studying at the academy for only five months. Only three months after graduation, most graduates were posted to senior positions in Soviet Air Force general staff, a prospect Fiebig found bizarre. He summed up his initial observations by saying that "One cannot help but think that the Academy is a 'quick fix' in the truest sense of the word."⁴⁸

His assessments of the courses themselves were also generally negative. Classes took place in the form of "question and answer" with simple, right or wrong solutions. Some of the instructors lacked preparation, further weakening the value of the courses. Others were simply not particularly invested in the courses. Fiebig noted that with "few exceptions, all the air tactics teachers are from the old Tsarist Imperial Air Force," and

promoted to manage all Air Force units on the Eastern Front. After the war, he was captured by the British, expedited to Yugoslavia and executed for war crimes.

⁴⁷ Zeidler, p. 110.

⁴⁸ "Betr. Strategische Aufgabe Nr. 1 und ihre durchführung bei der Kommandeur-Fakultät der Luftakademie [Report on Strategic Problem # 1 and their implementation at the commander-faculty of the Air Academy]," February 15, 1926, RH/2/2217, BA-MA, pp. 4-6.

tended to teach from very old tactical manuals.⁴⁹ During examinations, instead of forcing students to make quick decisions on issues of tactics and doctrine – as was standard in German training – the Soviet instructors assigned tactical problems as homework. Instead of teaching quick thinking, trainees wrote orders or tactical reports that tended to “degenerate into long written pieces, lacking precision of expression or brevity entirely.”⁵⁰ When assigned basic technical work, the “lack of education” of the cadets was extremely evident.⁵¹ But Fiebig’s real criticisms were organizational. The evaluation system was pass-fail, and nearly every attendee graduated and received a posting with the VVS general staff. This hardly motivated conscientiousness. Further, their instructors enforced almost no discipline at the academy. As Fiebig noted, “missing lessons is hardly even reprimanded. And it is actually rare to experience a lecture that begins punctually or ceases at the correct time.”⁵² Fiebig saw Soviet students as ill-prepared for serious responsibilities because of these shortcomings at the academy. Perhaps unsurprisingly given the pejorative tone of his reports back to Germany, his advice was ignored by Baranov. Even the Russian instructors he lived alongside proved unreceptive to his feedback. In one case, Fiebig noted of an assignment that “therein lies in my opinion a major error in training; I have in fact pointed it out verbally, but it’s difficult to dissuade them from their system.”⁵³

⁴⁹ “Betr. Strategische Aufgabe Nr. 1 und ihre durchführung bei der Kommandeur-Fakultät der Luftakademie [Report on Strategic Problem # 1 and their implementation at the commander-faculty of the Air Academy],” February 15, 1926, p. 1.

⁵⁰ Ibid, pp. 4-6.

⁵¹ Ibid, pp. 4-5.

⁵² Ibid.

⁵³ Ibid, p. 4.

The early German assessment of Russian technical facilities was equally damning, though of greater import to the Soviet-German relationship. In 1925, Fiebig, in the company of Red Air Force instructors, visited a laboratory located in Eastern Moscow called NAMI [The Scientific Institute for Engine Research]. His group was given a tour of the engine and motor workshops. The tour took them through three laboratories. In the first, there were three BMW and Junkers aviation engines, as well as a 12 cylinder Kondor-Engine, all from Germany.⁵⁴ In the second, there was a Junkers L-5 engine mounted on a testing block. In the third, a 400 horsepower American-built Liberty Engine was mounted on a testing standing and surrounded by mechanical equipment.⁵⁵ Fiebig concluded that all of the work being done at NAMI consisted of reverse engineering foreign component parts. He was right. From 1924 to 1930, the Soviet Union borrowed heavily from foreign technical developments in an effort to “catch-up” technologically.

After his self-perceived failures at the VVS Air Academy, Fiebig tried to prove of use to his hosts in the technical fields. During his tours of Soviet training facilities in Lipetsk, Smolensk and Vitebsk he noticed that the Soviets possessed almost no “modern on-board [radio] equipment” and that their radio technology on the ground was woeful. With great diligence, Fiebig informed Lieth-Thomsen that “during my vacation in Germany I came up with a practical proposal to develop a new 75 watt Telefunken Radio device.”⁵⁶ He sent his schematic to head of the Red Air Force Baranov upon his return,

⁵⁴ “Betrieb: Wissenschaftliches Institut für Motorforschung – NAMI [Subject: Scientific Institute for Engine Research],” February 18, 1926, RH/2/2296, BA-MA, p. 1.

⁵⁵ Ibid, pp. 1-2.

⁵⁶ Ibid.

but found his enthusiasm unmatched by the Red Air Force; Baranov's "answer was that it is impossible at present!"⁵⁷ Depressed, Fiebig wrote to Lieth-Thomsen that "Everything here is in vain."⁵⁸

But while Fiebig's work had little effect on Soviet training or doctrine, the technical assistance provided by the other Germans was considered of first rate importance to the Soviets.⁵⁹ Their roles from 1924 to 1926 centered on technical training and management in the Soviet Union's nascent military-aviation industry. Wilberg assigned Lieutenant Hans Johannesson to serve as an aviation advisor with the VVS's Scientific and Technical Committee. Three other officers, "Diete, Droste and Rath, were used in assessing construction and manufacturing projects, with engine testing and establishing workshops... Ludwig Droste created an engine dynamometer, which the Russians built several copies of at their Khodynka testing ground."⁶⁰ Rath also worked with engine development, assisting the Soviets in the reverse engineering an American Liberty engine that they would mass produce in 1925.⁶¹ Another officer, Rudolf Hasenohr, joined the VVS's first bomber training facility in Serpukhov, providing design and training advice. Lieutenant Schröder also arrived to provide technical advice, eventually taking over the entire team after Fiebig's departure.⁶² The role of these five

⁵⁷ "Letter from Fiebig to Lieth-Thomsen," March 31, 1926, RH 2/2296, 54, BA-MA, pp. 1-8.

⁵⁸ Ibid. Fiebig would have been happy to learn that sometime later, the Soviets did indeed adopt a "new German 70-watt board transmitter manufactured by Telefunken." It was one of Fiebig's lone recommendations to be accepted. Zeidler, p. 110.

⁵⁹ "15ego Iunia Ya predstavatelya Nemskoi Gruppi Lip. [On the 15th of June I took a Group of Russian Representatives to Lipetsk]," June 17, 1925, 4-2-14 (1), RGVA, pp. 2-3.

⁶⁰ Zeidler, pp. 110-111.

⁶¹ "Fl. Bericht Nr. 56 [Flight Report Number 56]," September 25, 1925, RH2\2216, 62, BA-MA, p. 1.

⁶² They were joined at some point in 1925 by an "infantryman" named Hube and another officer named Haushofer, who also seem to have played roles in advising the VVS. Hermann von der Lieth-Thomsen, "Fl.

men in developing the Soviet aviation industry was apparently greatly appreciated, as the Soviets took pains to keep the officers on staff after their planned departure.⁶³

In the end, the team would remain as technical advisers to the VVS for two years. Fiebig and five of the officers remained in the VVS into 1926.⁶⁴ They then became the core of the new Soviet-German project at Lipetsk: in May 1926, Johannesson, Diete and Droste all joined the staff at Lipetsk. Rath, who apparently was regarded as something of a prodigy, received a posting in Moscow in 1926 as Lieth-Thomsen's assistant. Lieth-Thomsen wrote back to Berlin that "Rath made no promises [regarding the length of his stay] but I did my part to convince him to stay because I was happy to have such a clever officer here."⁶⁵ Of the German team, only Fiebig returned home immediately in 1926, taking a job with Luft Hansa that had been arranged by the Reichswehr.⁶⁶ Their transfer was not the end of German technical and training consulting. Limited educational exchanges to the Soviet Air Force academies continued for three more years after the dissolution of Team Fiebig. Only in 1929, Yakov Alksnis, the head of the Red Air Force, terminated the program, telling Lieth-Thomsen at Moscow Center that "that they [the VVS] are not interested in education... the Ru[ssian] side wishes to emphasize tactical training and technical research."⁶⁷ Those goals would be pursued at Lipetsk.

Bericht Nr. 90 vom 3.IV.26 [Flight Report Number 90 on June 3, 1926],” June 10, 1926, RH/2/2297, 298, BA-MA, pp. 1-8.

⁶³ Ibid.

⁶⁴ Hermann von der Lieth-Thomsen, “F.l. Nachrichten Nr. 2 [Flight Report Nr. 2],” July 11, 1924, RH/2/2216, 329, BA-MA, p. 1-4.

⁶⁵ “Fl. Bericht Nr. 28 [Flight Report Number 28],” March 19, 1925, RH/2/2216, BA-MA, p. 4.

⁶⁶ Gorlov, p. 146.

⁶⁷ “Stellungnahme zu den Ru. Vorschlägen,” January 18, 1932, RH12/I/60, pp. 23-35, BA-MA, p. 1.

THE FOUNDATION OF LIPETSK

Seeckt wanted to construct a facility in Russia for combat flight training and military aviation development, the two things that could not be done in Germany. When negotiations began in 1924, the Red Air Force offered the Reichswehr a base at Odessa, hoping to also attract naval aviators from the Reichsmarine. But after the Reichsmarine turned the offer down, the decision was made to look elsewhere.⁶⁸ Preliminary discussions pointed to the possibility of conducting work at the VVS's airbase at Lipetsk. This base had only rudimentary facilities but good rail links.⁶⁹ The first German aircraft and pilots went to Lipetsk while it remained a Soviet air base in October 1924.⁷⁰ They reported that Lipetsk had the advantage of being relatively southerly and enjoying particularly good flying weather for the Soviet Union.

A year after the arrival of Group Fiebig in the Soviet Union, the Germans presented a detailed program for a flight school at Lipetsk to Baranov. After some negotiation in Moscow, the two sides formally signed a protocol establishing Lipetsk on April 15, 1925.⁷¹ The contract provided for the immediate lease of the base at Lipetsk by Sondergruppe Moscow for the purposes of establishing a flying school and factory for the testing and modification of aircraft. As there were almost no buildings on site, the treaty

⁶⁸ Speidel, p. 9, p. 18.

⁶⁹ Ibid, p. 18.

⁷⁰ "Fl.Bericht Nr. 6 [Flight Report Number 6]," October 23, 1924, RH/2/2216, 299, BA-MA, p. 4.

⁷¹ "Protokol über die Vereinbarungen zwischen der Russischen Luftflotte und dem Vertreter der Sondergruppe in Moskau über Einrichtung einer Fliegerschule und eines Gerätelager in Lipezk [Details of the Agreement between the Russian Air Force and the representatives of the Special Group in Moscow regarding a flying school and an equipment warehouse in Lipetsk]," April 15, 1925, RH2/2214, 2, BA-MA, pp. 1-4. Speidel believed that the VVS and Reichswehr agreed to a contract for Lipetsk in 1924, but the contract in the German national archives is dated the following spring. He might have believed an arrangement had been reached earlier because of the dispatch of German pilots to Lipetsk the previous fall.

allowed for the establishment of a “hangar, workshop, administrative office, storage facilities” and barracks to be built on site no later than the end of June 1925, only 115 days away.⁷²

Unlike Fili, Kama, Podosinki or Tomka, from 1924 to 1930, the Reichswehr was effectively allowed to do as it pleased at Lipetsk under the terms of the initial contract. As Lipetsk alumni Wilhelm Speidel recalled, “the direction and operation of the whole facility were exclusively German.”⁷³ The Germans requested the authorization of eight permanent staff members: a commandant, flight instructor, assistant flight instructor, two mechanics, an armorer, an assistant armorer and a warehouse administrator, periodically supplemented by six to seven trainee pilots.⁷⁴ There was also a provision that the Germans would dispatch a doctor and provide modern medical facilities at some point in the future. The treaty terms provided for 21 Russian staff at Lipetsk, comprised of one liaison officer and twenty support technicians. These latter would be trained by their German counterparts while providing essential support to the German aviation teams. The contract detailed their jobs: “fourteen mechanics, two carpenters, two furniture makers, a painter and a blacksmith... at least one of whom must be conversant in German.”⁷⁵

⁷² “Protokol über die Vereinbarungen zwischen der Russischen Luftflotte und dem Vertreter der Sondergruppe in Moskau über Einrichtung einer Fliegerschule und eines Gerätelager in Lipezk [Details of the Agreement between the Russian Air Force and the representatives of the Special Group in Moscow regarding a flying school and an equipment warehouse in Lipetsk],” p. 1.

⁷³ Speidel, p. 25.

⁷⁴ “Protokol über die Vereinbarungen zwischen der Russischen Luftflotte und dem Vertreter der Sondergruppe in Moskau über Einrichtung einer Fliegerschule und eines Gerätelager in Lipezk [Details of the Agreement between the Russian Air Force and the representatives of the Special Group in Moscow regarding a flying school and an equipment warehouse in Lipetsk],” p. 1.

⁷⁵ Ibid, p. 2.

The financial aspects of the facility mirrored the later contracts at Kama, Podosinki and Tomka, but with a twist: The Germans expected considerable autonomy at the facility, and also sought to disguise the base as a “private flight school” to avoid Versailles (a deception they would soon abandon). For these reasons, the Reichswehr agreed to cover the costs for the entire endeavor out of their black funds. This included paying not only German, but also the Russian, personnel present. Specifically, funds directed through Moscow Center – the secret German military office run by Hermann von der Lieth-Thomsen in Moscow – would cover the costs of the mechanical staff at Lipetsk, provide their meals and their accommodations, as well as pay for a detail of local militiamen to guard the perimeter of the facility. The cost of supporting the Soviet staff would grow considerably as the school aged: by 1931, the cost of day and night guards for the base’s perimeter cost more than 5 percent of the entire station’s budget by itself.⁷⁶ The Reichswehr also agreed to finance the transportation of all materials from Leningrad to Lipetsk. These measures meant that Lipetsk would be the most expensive of the joint projects. None of the other facilities included such provisions.

Indeed, Lipetsk proved so costly to construct and maintain that it forced the Reichswehr to seek financial assistance. The Reichswehr’s training inspectorate had a budget of about ten million Reichsmarks a year, three million of which went annually to secret projects in Russia. But by the time Lipetsk reached operation in 1926, Moscow Center spent two million Reichsmarks per year just to maintain existing facilities.⁷⁷ This

⁷⁶ “Kollektiv-Vertrag 1932-1933, [Collective Agreement, 1932-1933],” May 31, 1932, RH 12/I/59, 30-38, BA-MA, p. 8

⁷⁷ Speidel, pp. 23-24. That figure would rise to close to three million per year by 1931. “Fl. Bericht 312 [Flight Report 312,” February 2, 1931, RH/12/I/57, 209-213, BA-MA, p. 1.

figure did not include the much higher cost of building the base and buying the first 100 aircraft for its use. The expense of Lipetsk meant that the Reichswehr's black funds were insufficient to cover the operating costs of the facility. Instead, Lipetsk had to be paid for out of the so-called Reichswehr "blue budget." These were funds devoted to purposes illegal under Versailles, but with the support of "cabinet members and selected representatives of the parties on the budget committee."⁷⁸ The German government used financial improprieties to hide these costs from the Allies, with much of the initial injection of money at Lipetsk paid for from a fund collected to finance passive resistance in the Ruhr in 1923.⁷⁹ By 1933, the German government had provided more than 20 million Reichsmarks in "blue funds" for Lipetsk's maintenance.⁸⁰

The political and financial costs encouraged the Reichswehr to use Lipetsk more aggressively than they might have otherwise. Lieth-Thomsen, who effectively supervised the formation and management of Lipetsk through 1929, intended that Lipetsk would be a small endeavor. He wrote in 1925 that the initial class of fighter pilots should only include six or seven students. The budget should be limited to 420,000 marks per year.⁸¹ The entire staff should number fewer than twenty. But it rapidly became apparent that the marginal cost of sending ten pilots to Lipetsk was not significantly lower than sending fifty, given the facility's high operating costs. By 1927, the *modus vivendi* reached with

⁷⁸ Speidel, p. 22.

⁷⁹ *Ibid.*, p. 23.

⁸⁰ *Ibid.*, pp. 22-24. This cooperation with the German government also meant that Lipetsk featured more prominently in newspaper rumors of secret cooperation than any other facilities; its existence was revealed during the Manchester Guardian scandal, while Tomka and Kama remained better hidden.

⁸¹ "Fl. Bericht 27; Schule Lipetsk [Flight Report Number 27; School Lipetsk]," March 12, 1925, RH/2/2216, BA-MA, p. 2.

Stresemann and the civilian government had also lessened fears about the consequences of another public revelation. As a result, Lipetsk would become the largest and most elaborate of all of the joint facilities in Russia. It would also become the primary testing ground of the German military aviation industry until 1933, hosting a large array of aircraft prototypes.

What were the German objectives at Lipetsk? According to Truppenamt staff officer and Lipetsk pilot Wilhelm Speidel, the Reichswehr had formulated a seven-point program:

the training of civilian flying personnel to master fighter piloting and [become] fighter flight instructors; the training of civilian technical personnel for all disciplines within the air force; fighter pilot training courses for active officers; training for air observers [for and in conjunction with ground and artillery action]; tactical and technical testing of warplanes; the collection of tactical, technical and organizational experience in all fields; the training Russian Air Force ground staff in ongoing courses as a supplementary task.⁸²

Maintaining the training of older pilots featured as the main goal of the facility in 1925, shifting towards a focus on the training of younger pilots in 1928. This remained its central effort until 1930, when the emphasis grew on the technical possibilities of Lipetsk.

Soviet interests at Lipetsk, initially, were also limited in scope. The initial agreement of 1925 provided for the training of small groups of Soviet pilots and mechanics. In addition, the VVS was allowed to inspect technical equipment sent to Lipetsk. This provision became more contentious as Lipetsk grew into the Reichswehr's primary aviation testing ground. From 1924 to 1930, Soviet goals were limited to gaining

⁸² Speidel, p. 25.

access to German technical materiel and training grounds crew. But as the Reichswehr expanded the facility to accommodate technical work, the VVS began dispatching large teams of Soviet engineers and mechanics to study German technology and test their own devices. In addition, Soviet test pilots gained permission to take up German prototypes, which they began doing with frequency in 1930. By that juncture, Baranov's aims at Lipetsk were to master German technology, develop their own, and – as at the other facilities – train large numbers of technical personnel with German assistance.

LIPETSK IN OPERATION

Lipetsk began its existence as a landing strip and ersatz training facility for the Red Air Force. It would be expanded considerably under the terms of the Soviet-German agreement. Working – oddly enough – with the local city government in Lipetsk, Moscow Center arranged for the construction of warehouses, hangars, workshops, repair facilities, barracks and assorted outbuildings.⁸³ Initial efforts to have the Russian side construct barracks and hangars on contract were cancelled when it became apparent that it would be far cheaper simply to import prefabricated buildings from Germany because of materiel shortages in Russia.⁸⁴ As a result, like Kama and Tomka, every piece of equipment for construction was imported by the Germans. The Russians provided only “from their land raw building materials (stone and wood)” and labor.⁸⁵ The Reichswehr shipped equipment via sea to Leningrad or flew it “at the greatest heights and without

⁸³“15 sego Iunia Ya predstavatelya Nemskoi Gruppi Lip. [On the 15th of June I took a Group of Russian Representatives to Lipetsk],” p. 1.

⁸⁴“Fl. Bericht Nr. 28 [Flight Report Number 28],” March 19, 1925, RH/2/2216, BA-MA, p. 3.

⁸⁵ Speidel, p. 32.

landing over the border states.”⁸⁶ Despite these difficulties, the base reached readiness in only a few months. By June 1925, as planned, the facilities at Lipetsk were ready for the arrival of personnel.

Some months before buildings began rising at Lipetsk, a small group of German officers had met in Berlin and discussed the potential scale, scope and operations of the new airbase. The key participants included Hermann von der Lieth-Thomsen, himself one of the founders of the Imperial German Air Force; Professor Heller, a German air force engineer; and Colonel Walter Stahr, an old friend of Lieth-Thomsen’s. For Lieth-Thomsen – heading the project – the critical question was who to hire to supervise the work at Lipetsk. His criteria were quite specific: “a manager of the old type and a good flier” who could maximize the Reichswehr’s limited resources.⁸⁷ Simultaneously, however, in order to conceal the illegal nature of the enterprise, Lieth-Thomsen wanted a retired officer who could “direct the entire operation of the school,” thus giving the illusion of a “purely private enterprise...otherwise, we would be in unnecessary conflict with certain provisions of the Treaty of Versailles.”⁸⁸ In terms of the school’s management, all of its activities and communications would be subordinated to Lieth-Thomsen’s office in Moscow, but Lieth-Thomsen intended to leave Lipetsk’s commandant with considerable autonomy.⁸⁹

⁸⁶ Speidel, p. 32.

⁸⁷ “Fl. Bericht 27; Schule Lipetsk [Flight Report Number 27; School Lipetsk],” March 12, 1925, RH/2/2216, BA-MA, p. 2.

⁸⁸ “Fl. Bericht 27; Schule Lipetsk [Flight Report Number 27; School Lipetsk],” p. 2; “Fl. Bericht Nr. 28 [Flight Report Number 28],” March 19, 1925, RH/2/2216, BA-MA, p. 1.

⁸⁹ “Fl. Bericht Nr. 28 [Flight Report Number 28],” March 19, 1925, RH/2/2216, BA-MA, p. 3.

Lieth-Thomsen's ideal candidate was Walter Stahr, former commander of the 7th Army's Air Wing, whom he had invited to the discussion sessions in the winter of 1924-1925. Lieth-Thomsen described Stahr as "an extraordinarily practical person...who has often made the most of slim resources."⁹⁰ Further, Stahr had the advantage of being retired: he had left the Reichswehr as a major in 1922. But Stahr proved hesitant to commit to Lipetsk. The conditions in Russia in 1925 were very inhospitable to foreign residents. That year, one German officer had resigned and another requested to take an extended leave of absence, both citing the poor living conditions. In part because of his young wife and two children, Stahr agreed to take over management of the school at Lipetsk for a hefty salary of \$500 – paid in US dollars – a month.⁹¹

Stahr and Lieth-Thomsen then set about finding other staff for the school. Stahr traveled to Moscow, then back to Germany to supervise "procurement, personnel compilation and course preparation" for Lipetsk.⁹² In conversations with Stahr, Lieth-Thomsen described his ideal flight instructor as an combat veteran not currently in the Reichswehr who had flown both the D XI and XIII and could teach "dogfighting, squadron flying, shooting and theoretical training."⁹³ In addition, Lipetsk required the services of a master mechanic, completely "familiar with modern engines" who could teach "technical operations, motor design, manage the repair workshops and materiel

⁹⁰ "Fl. Bericht 27; Schule Lipetsk [Flight Report Number 27; School Lipetsk]," pp. 5-7.

⁹¹ "Vertrag zwischen Herrn v.d. Lieth und Herrn Stahr [Contract Agreement between Herr von der Lieth Thomsen and Herr Stahr]," March 12, 1925, RH/2/2216, BA-MA, p. 1. Given that his housing, food and other costs were provided for in Russia, he would be paid only \$350 while abroad. That comes to about \$7,000 a month in 2013 dollars.

⁹² "Fl. Bericht Nr. 28 [Flight Report Number 28]," March 19, 1925, RH/2/2216, BA-MA, p. 1.

⁹³ *Ibid*, p. 2.

depot.”⁹⁴ This officer would have teams of mechanics training under him while at Lipetsk. This role Stahr and Lieth-Thomsen filled more easily, as Lieth-Thomsen knew an “excellent mechanic who spent five years in a Russian prisoner-of-war camp and is fluent in Russian.”⁹⁵

Lieth-Thomsen also made it clear in 1925 that he wanted as few German staff present as possible, given concerns over cost and the Treaty of Versailles. He told Stahr that the total staff for the first summer session in 1925 should be only about a dozen, equipped with eighteen total aircraft for use by both the staff and the Russians.⁹⁶ Lieth-Thomsen also hoped to supplement the small number of Germans by attracting as many Russian mechanics and staff people as possible to reduce the cost of managing the school, as Russians would be cheaper than Germans.⁹⁷ This vision of a “small” Lipetsk would only last through the end of 1925.

To provide cover for the work at Lipetsk, the German formation at Lipetsk was codenamed the Russian Fourth Escadrille; a number of old Russian reconnaissance craft were left in visible places to add to the illusion.⁹⁸ German “permanent staff” about sixty strong, including military and civilian. It grew by an additional fifty staff during the summer months when pilots came to train at the base.⁹⁹ A total of 200 Germans were at the facility during the summer, including students. In the late 1920s, the Germans began

⁹⁴ “Fl. Bericht Nr. 28 [Flight Report Number 28],” March 19, 1925, p. 2.

⁹⁵ Ibid, pp. 2-3.

⁹⁶ Ibid, p. 4.

⁹⁷ Ibid, p. 3.

⁹⁸ Speidel, p. 25.

⁹⁹ Ibid, p. 25.

to increase their technical testing program. The facilities at Lipetsk expanded to hold the additional staff and aircraft. By 1930, the base included two runways, an

extensive complex of hangars, a shipyard [on the river Voronezh] manufacturing and repair shops, as well as a modern engine dynamometer. There were also administrative and residential buildings, a hospital equipped with the most modern medical equipment, radio and telephone operating systems, rail connections...It was state of the art.¹⁰⁰

As the base expanded to handle more technical testing, the number of German officers and men grew to 300.¹⁰¹ On the Russian side, numbers were roughly parallel. By 1930, the VVS had numerous ground staff, engineers, mechanics, as well as a handful of test pilots and trainees at Lipetsk.¹⁰² In addition, the support staff at the facility numbered in the hundreds, all of them employees of Moscow Center.

Interactions between these large delegations at Lipetsk were generally colder than elsewhere at the cooperative facilities. At Kama, the nature of classroom work brought a certain familiarity between German and Soviet officers. At Tomka, the small number of officers and the fact that all the Russians present spoke German led to fairly close relations between the two sides, as did Jan Zhigur's accommodating presence. But at Lipetsk, with its much larger numbers, it was easier to isolate the German fliers. Speidel reported that Soviet grounds crew, militiamen and even the official Soviet Air Force liaison made pains to "avoid" the Germans and minimize interaction.¹⁰³ There were a number of formal events and parties, but they were staged for propaganda purposes: the parties all involved "expensive delicacies and copious amounts of alcohol" which the

¹⁰⁰ Speidel, pp. 24-25.

¹⁰¹ Ibid, p. 25.

¹⁰² Ibid, p. 26.

¹⁰³ Speidel, p. 40.

Germans found awkward given that the local population was on the edge of hunger.¹⁰⁴ Even with the drinking and frequent toasts, it was clear that the Soviet officers were under strict orders; they behaved in a “reserved and correct manner.”¹⁰⁵

The Germans at Lipetsk, as elsewhere, were under a strict code of conduct. Leaving the grounds was not permitted. Even though the Germans paid for the security at Lipetsk, “the whole complex was carefully... guarded by Soviet militia” who acted more like jailers than protectors of the German pilots.¹⁰⁶ The Germans had relatively free access to the city of Lipetsk, but the Soviets frequently complained about the results of these trips into town.¹⁰⁷ The GPU presence at Lipetsk was large and noticeable: Speidel recalled that “it was clear that there was an inconspicuous, but systematic surveillance within the camp.”¹⁰⁸

There was another aspect of Soviet-German relations at Lipetsk that proved complicated. Lipetsk’s size and location raised a number of difficulties for Moscow Center which the other facilities did not. The several hundred Russian support staff were paid by Moscow Center, meaning that every year, a collective bargain agreement had to be made between representatives of the workers on site and the German management team. This was a contentious process, particularly by the fall of 1931, when the first food shortages began to appear thanks to collectivization and forced confiscations of grain. In 1932 and 1933, this process led to widespread famine in Ukraine and Southern Russia.

¹⁰⁴ Speidel, p. 40.

¹⁰⁵ Ibid, p. 40. These parties compare unfavorably to the more open parties recorded by alumni of Kama and Tomka.

¹⁰⁶ Ibid, p. 25.

¹⁰⁷ Ibid, p. 25.

¹⁰⁸ Ibid, p. 39.

Lipetsk was in the midst of this famine zone where more than a million Russians would die in the next twenty-four months. Severe food shortages meant that German wages, paid in rubles to the local staff, were no longer sufficient by 1931 for survival. The Soviet Army personnel at the base never suffered from the same food shortages, a sign of the Soviet regime's priorities. But the civilian personnel suffered greatly. As a result, in the fall of 1931, the Germans agreed to raise the living wages of the Soviet staff at Lipetsk, writing that "the station has an obligation to those who reside on station and the Russian workers and employees... to alter their wages given current (that is, general famine) conditions."¹⁰⁹ But the Germans lacked any additional money in their budget, so Lieth-Thomsen was forced to decrease the number of Russian personnel for the winter of 1931 from 309 to 248 in order to accommodate the remaining Russian staff.¹¹⁰ What happened to those terminated from their contracts at Lipetsk is unknown, but some must have become casualties of the famine.

The Germans did not have to worry about the food crisis. Speidel, who was in residence at Lipetsk in 1932, recalled being pleasantly surprised that the German side was adequately supplied with food despite the "difficulties and fluctuations in food supplies for the local population."¹¹¹ While thousands of Russians starved just beyond the gates of the airbase, the Germans kept on hand stores of expensive foreign cheese, lemons,

¹⁰⁹ "Kollektiv-Vertrag 1932-1933, [Collective Agreement, 1932-1933]," May 31, 1932, RH 12/1/59, 30-38, BA-MA, p. 1.

¹¹⁰ Ibid, pp. 1-8. The notes on collective bargain note that the workers on site received a wage increase from 44 rubles per month to 48.40 rubles per month under the terms of the new arrangement. It also noted that "the station staff has been unable to... establish legally fixed salaries which cannot be influenced by negotiations."

¹¹¹ Speidel, p. 39.

pineapples, half a dozen types of German sausages, Japanese seafood, noodles, hams, imported chocolates, and countless other luxuries, as well as huge quantities of staples such as butter, eggs and flour that were widely unavailable among the civilian population.¹¹² Some of this food was provided by the Russians. In 1931, the German warehouse staff at Lipetsk apologetically rejected shipments of basic foodstuffs, as the “camp did not have room for any more.”¹¹³

The contrast was stark, and one the Germans quickly came to understand when they visited town. In 1930, even before the famine reached its peak, the Soviet liaison requested that the Germans cease “selling and donating goods of German origin.”¹¹⁴ Some of these exchanges were charitable, some financial, and others of a more salacious nature. Soviet border security confiscated from one young German pilot pairs of women’s stockings and panties. When confronted, he claimed that they were gifts for the elderly “base charwoman.”¹¹⁵ Likely they were destined for a mistress in Lipetsk itself: the GPU recorded that several of the German pilots enjoyed a “large circle of female acquaintances in the city.”¹¹⁶

¹¹² “Bericht Nr. 316, [Report Number 316],” March 9, 1931, RH12/I/57, 228, BA-MA, p. 1.

¹¹³ Ibid, p. 1. The only thing German officers were short on were cigars. To remedy that, every junior pilot was told to bring a box of 50 cigars with him to Lipetsk. It was actually listed in the “required packing” memorandum distributed to them (and their parents if they were particularly young) before departure with a little added note that the cigars were not for the pilots, they were for the base, and that if they wanted to smoke, they should bring more than 50. “Austrüstung für die Reise nach Lip. [Equipment for the Journey to Lipetsk, May 2, 1928, RH/8/V/3623, 11 BA-MA, p. 1.

¹¹⁴ Abschrift, Tagesanordnung #3, [Transcript: Daily Arrangement Number 3],” January 1, 1930, RH 12/I/64, 34, BA-MA, p. 1.

¹¹⁵ “Abschrift: Herr Koch, Zollkontrolle Bigossowo [Transcript, Customs Control, Herr Koch,” January 1, 1930, RH12/I/64, 37, BA-MA, p. 1.

¹¹⁶ “O buivshem 4-m Nemetskom Aviaotriade, Lipetskoi Gorodskii Otdel MGB Voronezhskoi Oblasti [Report on the former 4th German Squadron, Lipetsk City Department of the MGB in the Voronezh Region,” Compiled on January 18, 1950, P-2176, 1, 1, l. 1, Gosudarstvennyy Archiv Lipetskoi Oblasti [Government Archive of Lipetsk Oblast, or GALO], p. 14.

For many of the young German pilots who went through Lipetsk, the whole trip was a grand adventure. There was a certain naiveté and innocence in their recollections. Future ace Wolfgang Falck spent the summer of 1932 there when he was 22 years old. He described the period he described as a “holiday with flying thrown in.”¹¹⁷ He found his time in town particularly fun:

We all had a great time, and we also got to know the Russian girls there very well. I really liked this part of my time there, and I had a steady girlfriend, a wonderful girl. However, we had to be careful, as all of these girls would have loved to marry any foreigner just to leave Russia.¹¹⁸

But the GPU did not view this sort of fun as quite so innocent. In 1929, they arrested 19 “friends” of the Germans in Lipetsk. Another eight were arrested in 1937. When the war began, another 39 disappeared, mostly former staff members of the facility.¹¹⁹

Despite their “friends” and food, most of the Germans hardly enjoyed luxurious living conditions at Lipetsk. After the expansion of the facility in 1930 with the arrival of 25 Reichswehr engineers and close to 75 support staff, pilots and researchers were forced to triple up in the bedrooms of the eight German barracks. Only the heads of the experimental group, the leading flight instructor and the camp commandant received their own rooms that summer.¹²⁰ The complications with keeping families informed led the

¹¹⁷ Heaton, Lewis, pp. 175-176.

¹¹⁸ Ibid, pp. 175-176.

¹¹⁹ “O buivshem 4-m Nemetskom Aviaotriade, Lipetskoi Gorodskii Otdel MGB Voronezhskoi Oblasti [Report on the former 4th German Squadron, Lipetsk City Department of the MGB in the Voronezh Region],” pp. 7-8. In 1950, when the MGB reviewed these cases, four of the last thirty-nine arrested (three women) were found innocent: “the study of archival investigation files revealed that these agents were not in fact unmasked as agents of the German intelligence.” After nine years in the GULAGs, they were allowed to return home to Lipetsk.

¹²⁰ “Bericht: Unterbringung 1930 [Report: Lodging in 1930],” April 22, 1930, RH 12/I/57, 25, BA-MA, p. 1.

Reichswehr to request, whenever possible, that the officers and staff be unmarried.¹²¹ The activities of the pilots was kept strictly secret: “nobody, not even next of kin, could be informed of the real reasons for the resignation and the new profession” of their pilot relatives.¹²² The legal fiction to spouses regarding their husbands’ activities proved a significant strain on families, leading to the suicide of at least one pilot’s wife.¹²³ And further, the flight training itself was deeply dangerous, resulting in frequent fatalities. Getting the corpses of the dead back to Germany proved difficult: “coffins with the corpses of downed airmen from Lipetsk were packed in boxes and declared as “machine parts.” They were then smuggled out of the free port of Stettin using a trusted and known customs officer.”¹²⁴ The need to write down such a regulation highlights how often bodies needed to be shipped home.

After his first summer at Lipetsk, Stahr wrote to his old friend Helmuth Wilberg – head of the Reichswehr’s Air Staff back in Germany – to tell him of the conditions and urge him to provide for the families of the men working in Lipetsk. He impressed to Wilberg that

The men at Lipetsk, who live separated from their homes and family have truly earned it... You cannot do too much [to help them]! Those who spend a short time here find life in the summer in Lipetsk very pleasant and interesting. But those who are here constantly feel how much he has to give up and how much this work requires self-denial.¹²⁵

¹²¹ “Stelle eines Mitarbeiters in Kassenangelegenheiten Freigeworden [Employee Position Available in the Accounting Office],” March 22, 1932, RH 12/I, 59, BA-MA, p. 1.

¹²² Speidel, p. 33.

¹²³ Kurt von Schleicher, “Letter to General Franz Ritter von Epp” January 2, 1931, T-84/9, 9304, NARA II, p. 1. The wife of one pilot, who did not know the details of her husband’s activities, learned that her husband had been killed in a plane crash when she believed he had a safe job consulting a Soviet aviation firm. While on an aircraft flying to the funeral, she opened the emergency hatch and jumped to her death.

¹²⁴ Speidel, p. 33.

¹²⁵ “Letter to Wilberg,” August 25, 1925, RH2/2293, BA-MA, p. 1

Those who served at Lipetsk did so from a variety of motivations: love of flying, a sense of patriotism, money, or adventure. Regardless of their reason for being there, the Reichswehr directed their “self-denial and sacrifice” towards one end: the restoration of German air power for a new war in Europe.

THE TRAINING PROGRAM

On the morning of July 7, 1932, 21-year old Wolfgang Falck accelerated his Fokker D XIII into the Russian sky. As he circled upwards, two other aircraft climbed into formation behind him. His *Kette* [chain of three aircraft] was to engage three other German pilots in a dogfight. He and his wingmen, Ekkehard Hefter and Günther Radosch, circled and climbed to an altitude of 1500 meters. After ten minutes in the air, their opponents – led by 19-year old pilot Günther Lützow – appeared as dots on the horizon, moving directly towards them from the northwest.

Obedying his tactical training at Lipetsk, Falck maneuvered his aircraft to a position above the enemy, then began a sharp diving turn to come up behind them. His wingman Hefter followed along behind his squadron leader, dropping eighty meters in a few seconds meters as he swooped in behind the leading enemy aircraft, piloted by Lützow. Just as Hefter “had Lutzow in his scope and decided to ‘take him’... the collision took place. I had not seen Falck before the collision. From the upper right wing,

a piece about a meter long was razed off.”¹²⁶ Hefter immediately broke off the maneuver, struggling to keep his plane level. The Fokker D XIII he was piloting was sesquiplane, a biplane with a lower wing much smaller than the upper. Without half of the upper right wing, Hefter thought it unlikely that he could generate enough lift to keep the plane level and in the air. Constantly eying his right wing lest it come off completely, Hefter only just managed to reach the airfield with the greatest effort. The landing looked like it would be more of a crash, but with great skill, Hefter kept his plane level and brought it down smoothly some six minutes after the crash had occurred. Falck described his experiences with equal vividness:

I collided with one of my fellow pilots during an air combat exercise. He had turned into me, and I had an immediate engine problem, as I heard and felt a bang in the engine... Well, I still had power and landed. I was severely chastised for not bailing out, as the plane was in bad shape. I thought I had done the right thing, but I was told in no uncertain terms that aircraft were more easily replaced than pilots.¹²⁷

Both planes were listed as “lost” on the base’s weekly report, indicating the seriousness of the damage inflicted in the collision. Despite destroying two the facility’s few trainers, their commanding officer Max Mohr wrote of the incident that “the smooth landing by the young pilots... proves the self-confidence and good nerves of the pilots.”¹²⁸

His praise proved to be well deserved. Their class of graduates from Lipetsk would become known as the “Kameradschaft ‘31” [comrades of ‘31], the most elite class

¹²⁶ “Bruchbericht, Fokker D XIII Masch. Nr. 37 [Accident Report, Fokker D XIII Number 37],” July 7, 1932, RH 12/I/60, 75, BA-MA, p. 1.

¹²⁷ Heaton, Lewis, p. 176.

¹²⁸ “Bruchbericht, Fokker D XIII Masch. Nr. 37 [Accident Report, Fokker D XIII Number 37],” p. 1.

to graduate from Lipetsk.¹²⁹ They would stay close friends, risking execution together when they opposed Hitler in 1945 during the “fighter pilot’s revolt.” Nearly all of them would have distinguished careers. Wolfgang Falck, who earned his fifth and sixth kills over the North Sea, eventually became commander of Germany’s night fighter defense force. Günther Lützow would score 110 kills during World War II, only to disappear in action two weeks before the end of the war while flying an ME 262 jet fighter.¹³⁰ One of Lützow’s wingmen, Hannes Trautloft, would account for 58 planes in World War II, eventually being promoted to a series of senior command positions. Günther Radusch would eventually claim 65 kills, going down as World War II’s top night fighter pilot, a skill he had practiced for the first time at Lipetsk. Only Ekkehard Hefter, who had so barely avoided disaster on this training mission, would fail to become an ace. Instead, he bore the ill-fated title of the first Luftwaffe pilot killed in action after the reformation of the German air force in 1935. His plane crashed on one of the first combat missions of the Condor Legion in Spain.

Their training program in 1932 had evolved considerably since Lipetsk’s inception. Lipetsk’s pilot development course was designed and managed by a small, tight-knit group of senior fliers from World War I. The transcripts of meetings about

¹²⁹ They all attended Lipetsk in 1932, but began the twelve-month course that culminated at Lipetsk the previous summer.

¹³⁰ After the war, his friend Adolf Galland described Lützow a “a great leader and a true knight, a gentleman.” Lützow engaged in a running battle throughout the war with the SS over questions regarding the treatment of prisoners of war and the shooting of civilians. He risked court-martial for refusing orders to assist the SS in the murder of civilians in Russia in 1942, announcing to his entire squadron what the SS intended to do and telling them he considered them to be “barbarians.” He was threatened with execution in 1945 for leading the “pilot’s revolt” and was reassigned to combat duty as punishment instead. He was killed in the last few days of the war. “Interview with World War II Luftwaffe General and Ace Pilot Adolf Galland,” *HistoryNet*, 2006, <http://www.historynet.com/interview-with-world-war-ii-luftwaffe-general-and-ace-pilot-adolf-galland.htm>

Lipetsk's program show the heavy influence of Hermann von der Lieth-Thomsen, Helmuth Wilberg and Walter Stahr. Another officer of importance between 1925 and 1933 was First World War pilot-observer, future commander of the Condor Legion and eventually Luftwaffe-West Hugo Sperrle. Sperrle served as an instructor at Lipetsk and also took over the school's management in Stahr's absence on several occasions. Two other officers who were frequently involved in the discussions about Lipetsk and visited the base were future Generals Kurt Student – commander of Germany's Airborne Forces – and Hans Jeschonnek, who would be the Luftwaffe's chief of staff from 1939 until his death in 1943. Other alumni included future Field Marshals Albert Kesselring and Hans Stumpff.¹³¹ In essence, with the exception of Walter Wever, all of the major figures of the reborn Luftwaffe were involved in crafting the training program at Lipetsk. Their basic objective was to develop the cadre for a rapid expansion of the German air force, and specifically, train for a future war against the Poles:

The tactical, flying skills and practical lessons are to be focused on eastern circumstances. The training goal remains to develop squadron leaders, pilots, observers and fight pilots tactically and practically so that by the completion of the course, the most fundamental demands of a preliminary military mobilization may be placed upon them.¹³²

As planned, many of the alumni from this period would go on either to command fighter pilot training facilities or the first squadrons formed when the Luftwaffe was officially reborn in 1935.

¹³¹ Whaley, p. 81.

¹³² "Betr: Ausbildung Lehrgang L 1927 [Subject: Training Courses at Lipetsk], 1927" November 20, 1926, RH/2/2299, 62, BA-MA, pp. 1-6.

Germany had a large body of veteran experts upon which to draw as instructors when the school first opened in 1925. For its first three seasons of operation (1925-1927), Lipetsk's training courses were geared towards "Alt-Märker," retraining veteran pilots from the First World War. In 1925, training centered on short, 14-day fighter pilot courses for new pilots and 180 minutes of flight time "retraining" for World War I veterans. In 1925, some of the veterans also enrolled for fighter pilot instructor training, mastering additional tactical and technical information so as to teach the next generation. In 1926, with the arrival of additional military equipment, pilots at Lipetsk began practicing gunnery, marking the beginning of Lipetsk's formal fighter pilot training.¹³³ The initial proposal of a 14-day course was discarded in favor of a slightly longer period, centering on three weeks of flying and gunnery practice.¹³⁴ Four groups of pilots would pass through one of these courses each summer, with units constantly flying between June and September.

In 1928, this fighter pilot retraining program was supplemented with air force observer courses. Considerable emphasis was put upon the importance of observers in debates over Lipetsk. This was logical, given the importance that F.u.G. 1921 put upon combined arms warfare and the emphasis of the Reichswehr's aviation experts on tactical (rather than strategic) air power. A skilled observer's role was to identify targets and coordinate artillery with infantry and airpower. The observer training process required Russian assistance, as the Germans did not have artillery formations present in Russia.

¹³³ "Bericht über die Ausbildungstätigkeit der Station im Sommer 1931 [Report over the Training Program for the Station in the Summer of 1931]," November 8, 1931, RH12/I/60, pp. 2-17, BA-MA, p. 1.

¹³⁴ *Ibid.*, p. 1.

For both the 1929 and 1930 training seasons, German pilots and trainee-observers were attached to a Russian training ground near Voronezh where observers had a chance to practice coordinating with ground artillery.¹³⁵ Despite the Germans' generally low estimation of Red Army personnel with whom they worked, the Russian artillery services proved an exception: Wilhelm Speidel noted that Soviet artillery officers had an "excellent level of training."¹³⁶ Besides gaining experience in the air, trainee observers at Lipetsk centered on mastering technologies of the trade, particularly cameras, optical equipment, and radio equipment. Other skills involved mastering "aerial measurement calculation," as well as learning the basics of aerial navigation. A 1926 report proposing observer training noted that radio technology was still limited by technical problems, so that observers should also be taught the World War I-era technique of dropping messages in canisters to artillery units.¹³⁷ About 100 observers were trained between 1928 and 1930, when the Germans relocated observer training back to Germany.¹³⁸

In 1928, another major change occurred at Lipetsk: the first of the *Jüng-Märker* [literally, "the newly stamped," or "newly minted"] arrived.¹³⁹ The impetus for the shift towards younger pilots was the aging of those pilots who remained in the Reichswehr. By 1926, 80 of the 180 pilots secretly retained by Seeckt had become ineligible for "active

¹³⁵ Speidel, pp. 29-30.

¹³⁶ Ibid, p. 37.

¹³⁷ "Ergebnis der Besprechung über das Programm der Schule Lip 1925-1926 [Results of the meeting regarding the Program of the School at Lipetsk, 1925-1926]," November 14, 1926, RH/2/2293, BA-MA, p. 4.

¹³⁸ Speidel, p. 30.

¹³⁹ Ibid, p. 26; p. 28.

flight duty.”¹⁴⁰ Most of the German pilots who trained between 1925 and 1928 at Lipetsk were between 30 and 40 years old, and almost none were under 25. In 1928, Wilberg initiated a new program whereby very young men would be drawn into a twelve-month long flight program – six months of which would be spent at Lipetsk – and then commissioned into the Reichswehr.¹⁴¹ Youth was an essential requirement in the selection process, so the pilot “could be useful as long as possible as a fighter pilot.”¹⁴² The assumption was that the next war might be ten or more years away. While World War I veterans filled command positions and the ranks of the training schools, these younger pilots could serve as the leaders in combat itself. This proved to be the case: thirteen Second World War German aces can be identified with certainty as Jung-Märker from Lipetsk’s fighter pilot training school.¹⁴³

To train these young officers, the instructors and staff at Lipetsk had developed the program that would be adopted by the Luftwaffe after its restoration in 1935. Courses lasted a year. They began with six months of basic flight training at a “commercial flight school” secretly administered by the Reichswehr in Germany. Simultaneously, students went to a series of technical and tactical training lessons taught by German veterans.

¹⁴⁰ Edward L. Homze, *Arming the Luftwaffe: The Reich Air Ministry and the German Aircraft Industry, 1919-1939* (Lincoln, NE: University of Nebraska Press, 1976), p. 20.

¹⁴¹ *Ibid.*, p. 20.

¹⁴² Speidel, p. 28.

¹⁴³ “Fl. Bericht No. 324, [Flight Report Number 324],” April 28, 1931, RH12/1/57, 278, BA-MA, p. 1; “Vergütungssätze der z.Zt. vorhandenen, [Current Salary Roster],” April 1, 1932, RH12/1/60, 44-49, BA-MA, p. 45. The actual number is likely much higher. There are rosters for most of the training classes among the documents in the Freiburg archives, but most do not include first names, which makes it impossible to confirm whether or not other pilots were indeed future aces. Another famous name nearly trained at Lipetsk: Adolf Galland went through the first six months of Lipetsk coursework in Germany and was selected to go to Lipetsk as one of the Jung-Märker of late summer, 1933, but his class was instead diverted to a training camp in Italy after the facility at Lipetsk closed.

Among other skills, all candidates for Lipetsk had to master the use of a radio.¹⁴⁴ The best graduates of this program then departed to Lipetsk in the spring.

Getting to Lipetsk required much the same acrobatics as getting to the other Soviet-German military facilities; indeed, the process was first formalized by the Reichswehr through the trials of 1925. Each pilot received real passports from the German Foreign Ministry but with false names. They were instructed to dress as “tourists.” Most of these visitors took the “Nord Express Paris-Riga” train from Germany to the city of Daugavpils, where Soviet customs personnel on the border awaited their arrival and treated them “politely and generously, always prepared by a superbly functioning reporting system for Reichswehr travelers.”¹⁴⁵ They then passed on to Moscow, where Moscow Center handled all aspects of their remaining travel arrangements, currency exchanges and mail service with Germany.¹⁴⁶ The GPU assisted Moscow Center in these efforts, running a weekly “express” from Moscow to Lipetsk.¹⁴⁷

Upon arrival at Lipetsk, the first order of duty was to mastering tactical flying. Trainees were instructed to fly at the maximum altitude permitted by their aircraft that did not require an oxygen tank for the pilot, around 15,000 to 18,000 feet.¹⁴⁸ Cadets were also required practicing “blind flying,” where they were guided by instruments alone.

¹⁴⁴ Speidel, p. 29.

¹⁴⁵ Ibid, p. 33. The warm welcome for Reichswehr officers compared to the misery of “genuine travelers, who could scarcely pass through the “Iron Curtain” at that time.”

¹⁴⁶ Speidel, p. 34.

¹⁴⁷ “15 sego Iunia Ya predstavatelya Nemskoi Gruppy Lip. [On the 15th of June I took a Group of Russian Representatives to Lipetsk],” June 17, 1925, 4-2-14 (1), RGVA, p. 1.

¹⁴⁸ “Bericht über die Ausbildungstätigkeit der Station im Sommer 1931 [Report over the Training Program for the Station in the Summer of 1931],” p. 3.

This was essential practice for flying at night.¹⁴⁹ Because of the declining quality of the aircraft, there were a large number of accidents among the young pilots, particularly during “blind flying” exercises. Weapons testing accompanied these flying lessons, though most of the actual gunnery was conducted on the ground. Instructors were told to produce in their rookie fighter pilots through “frequent repetition... a flawless shot pattern.”¹⁵⁰ Trainee pilots’ first firing lessons always took place over gun sights against targets on the ground.

Once their individual skills had been honed, instructors then began to teach the young pilots to work together. This involved first flying alone, then in a *Kette* of three aircraft, then in a *Staffelverband*, a flight of nine aircraft flying in formation.¹⁵¹ In the *Kette* exercises, instructors simulated foreign fighter formations – particularly French – to add a particular element of realism to the air exercises. The culminating lessons of “hunting season,” as the fighter pilot instructors termed it, involved dogfighting simulations of two *Staffelverband* engaging each other. These flights were supplemented by conversations with combat veterans. As Mohr recorded, “[Our] in-depth discussions of tactical positions before and after flying stimulated and fostered tactical understanding. The average trainee shows good tactical disposition.”¹⁵² These tactical deliberations

¹⁴⁹ “Bericht über die Ausbildungstätigkeit der Station im Sommer 1931 [Report over the Training Program for the Station in the Summer of 1931],” p. 5.

¹⁵⁰ *Ibid.*

¹⁵¹ At this juncture, the “finger-four” formation for fighter aircraft that would become standard in the Luftwaffe had not yet been developed, though one of its two creators first learned to fly a fighter aircraft while in residence at Lipetsk. This was Günther Lützow, survivor of the crash noted above during his early days at Lipetsk.

¹⁵² “Bericht über die Ausbildungstätigkeit der Station im Sommer 1931 [Report over the Training Program for the Station in the Summer of 1931],” p. 4.

included a combination of studies of French and Polish tactics and wargames requiring quick thinking from the pilot-cadets.¹⁵³

For the young pilots, dogfighting was particularly thrilling. Some of these exercises were conducted jointly with the Russians. Starting in 1931, Russian bomber pilots from nearby Voronezh began to participate in maneuvers at Lipetsk. German Jung-Märker, instructors and a handful of Russian fighter pilots practiced attacking squadrons of Russian bombers from different angles: from above, directly behind and below, from either side and while coming directly at the incoming squadron. This drill was repeated in different types of aircraft: the Fokker D XIII single seater fighters, as well as the Fokker D VII two-seaters, where an observer in a second seat had control of the main gun.¹⁵⁴ The lessons gained by the Germans from these drills not only improved cadets' skills, it directly led to changes in German fighter pilot doctrine. According to the school report for summer 1931, "these tests have been a valuable experience and meant great progress in attacking day bombers. The experiences gained have led to amendment proposals for the "Fighter Pilot Manual."¹⁵⁵

As at Tomka and Kazan, 1931 was the high point of activity at Lipetsk. Commandant Max Mohr would write that it was the best year in Lipetsk's eight-year history, adding that "the formation of [fighter training] courses were carried out according to the experience gained over the last several years. Our training program has

¹⁵³ "Ergebnis der Besprechung über das Programm der Schule Lip 1925-1926 [Results of the meeting regarding the Program of the School at Lipetsk, 1925-1926]," November 14, 1926, RH/2/2293, BA-MA, p. 6.

¹⁵⁴ "Bericht über die Ausbildungstätigkeit der Station im Sommer 1931 [Report over the Training Program fo the Station in the Summer of 1931]," p. 12.

¹⁵⁵ Ibid, p. 4.

been improved to the point where it clearly achieves our main objectives.”¹⁵⁶ In addition, 1931 witnessed the first winter flight training: a group of eleven German pilots remained to “undergo a tactical training course from January to March.”¹⁵⁷ Already, German instructors began to envision the possibility of shifting the lessons learned at Lipetsk back to airfields in Germany when the opportunity arose.

The overall objective of the revised fighter training program was to teach trainees “to win the battle of air superiority and limit their own losses to tolerable levels in the fight against the enemy.”¹⁵⁸ The authors of the training program also noted that “it is worth more to develop attacking spirit and a daredevil mentality than to teach a university level knowledge of acrobatics.”¹⁵⁹ In this matter they seem to have succeeded. From 1925 to 1933, Lipetsk graduated around “120 excellently trained fighter pilots who – as it later turned out – were ready [for combat] after only a very short retraining on more modern fighter aircraft.”¹⁶⁰ In total, around 900 German pilots, observers, mechanics and engineers studied at Lipetsk.¹⁶¹

¹⁵⁶ “Bericht über die Ausbildungstätigkeit der Station im Sommer 1931 [Report over the Training Program for the Station in the Summer of 1931],” p. 2.

¹⁵⁷ “Fl. Bericht, Nr. 286 [Flight Report Number 286],” August 8, 1930, RH 12/I/57, p. 80, BA-MA, p. 1.

¹⁵⁸ “Ergebnis der Besprechung über das Programm der Schule Lip 1925-1926 [Results of the meeting regarding the Program of the School at Lipetsk, 1925-1926],” November 14, 1926, RH/2/2293, BA-MA, pp. 3-4.

¹⁵⁹ *Ibid.*, p. 6.

¹⁶⁰ Speidel, p. 29.

¹⁶¹ There is considerable debate about how many pilots graduated from Lipetsk. The common estimate until relatively recently was about 230 pilots and observers.¹⁶¹ Others, including a Nazi member of the Reichstag, believed the number was closer to 1,200. Neither number is quite correct, but the higher figure is closer to the truth. Speidel, who attended the facility and supervised some of its activities as a member of the T-1 office, estimated that 900 German personnel were trained there.¹⁶¹ He concluded a total of around 450 German pilots were trained during Lipetsk’s period of operation, with an additional 450 observers, mechanics and grounds crew also receiving training there.¹⁶¹ In the first year of operation, class sizes were small, but after 1925, there were usually four classes of 10-12 pilots per summer, plus an extended winter course; the average year saw between 45 and 55 pilots go through training at Lipetsk. Given nine years of courses, this puts the total figure around 450, which suggests Speidel’s estimate is on the mark. These

The career of Hannes Trautloft offers some illustration as to the “average” career of a Lipetsk Jung-Märker. Trautloft volunteered for a brief “commercial pilot training” program in Germany when he was 19 years old. Selected as one of the top ten pilots in his class, he was assigned to six months of Reichswehr tactical and technical training in Germany in the winter of 1931-1932. That spring, just 20 years old, he departed for Lipetsk, where he spent six months mastering fighter pilot tactics. With the reformation of the Luftwaffe in 1935, he was promoted to Lieutenant and trained up on the next generation of German fighters. In 1936, he was among the first German pilots sent to aid Franco during the Spanish Civil War. He served in Spain first as an instructor for other German pilots, then in combat. Trautloft became a squadron commander in 1939, then a wing commander during the Battle of Britain the following year. During his first three years in combat, he had 13 confirmed kills. In 1942, he was transferred to the Eastern Front, where he added 45 kills to his total. He was soon promoted out of combat, first as Inspector of Fighter Aircraft for the Eastern Front, then as Commander of Daytime Fighter Command back in Germany.¹⁶²

officers served as the nucleus of the new *Reichsluftfahrtministerium* [Reich Air Ministry], and in particular, the new general staff of the air force which was organized in 1933. Speidel, p. 44; Robert Craig Johnson, “Planting the Dragon's Teeth: the German Air Combat School at Lipetsk (USSR) 1925-1930.”

¹⁶² Trautloft would become a senior general in the Bundeswehr after the war, in part because he had earned the goodwill of his Western counterparts for an action he took in 1944. Trautloft heard rumors that a number of Allied airmen had been sent to Buchenwald Concentration Camp and were scheduled to be executed. He used his position to conduct an “inspection” of the air defenses and damage near camp to see if the rumors were true. During that tour, he confronted the SS guards and eventually confirmed the presence of Allied airmen when one yelled out at him in German begging for help. Trautloft fought and succeeded in earning their transfer to a Luftwaffe camp, saving 160 lives. Most of the other prisoners at Buchenwald were not so fortunate. See Collin Burgess, *Destination Buchenwald* (Kenthurst, Australia: Kangaroo Press, 1997).

THE TECHNICAL WORK AT LIPETSK

The initial program for Lipetsk did not include much in the way of technical research. The German aviation industry was in poor shape thanks to the Treaty of Versailles. Further, what research the Reichswehr hoped to achieve on aircraft design in Russia they foresaw being conducted at Junkers' Fili plant. Nonetheless, the small engineering team at Lipetsk performed some testing in 1925, experimenting with three foreign engine designs: the British Napier Lion, the American Liberty and Spanish Hispano aviation engines.¹⁶³ Much of this work was conducted simply to keep Lipetsk's air fleet operational, as it proved difficult and expensive to send replacement parts to Lipetsk.¹⁶⁴

After the first season of activity at Lipetsk, four former *Luftstreitkräfte* pilots – Major Wilberg, and Captains Sperrle, Kühl and Baumker – met in Berlin to discuss the results of Lipetsk and the next season of research and training. This proved to be a critical meeting. Their initial assessment was that it made financial sense to expand the program, particularly its research component.¹⁶⁵ Their first conclusion was that

We recognize that we need a military testing ground to perform [technical tests] which cannot be conveniently be conducted on other foreign test grounds (Sweden, Switzerland). For example, testing weapons on aircraft. For the winter, the following technical experiments are possible: machine gun testing...flight testing....gas tests.¹⁶⁶

¹⁶³ "Fl. Bericht Nr. 30 [Flight Report Number 30]," March 26, 1925, RH2/2216, 183, BA-MA, p. 1. "Fl. Bericht 56 [Flight Report Number 56]," September 25, 1925, RH/2/2216/, BA-MA, p. 1.

¹⁶⁴ Speidel, p. 26.

¹⁶⁵ "Ergebnis der Besprechung über das Programm der Schule Lip 1925-1926 [Results of the meeting regarding the Program of the School at Lipetsk, 1925-1926]," November 14, 1926, RH/2/2293, BA-MA, p. 1.

¹⁶⁶ *Ibid*, p. 2.

These basic experiments meant a significant expansion of the mission of the school at Lipetsk. Testing military equipment required the presence of active duty military officers. Bäumker agreed to travel to Lipetsk to undertake machine gun testing that winter. More than half a million marks would be spent expanding Lipetsk's facilities through the summer of 1927 to accommodate this new mission. The school's operating budget also doubled by 1929.¹⁶⁷

Devices such as bombs, machine guns, optical bomb target devices, optical sights could only be tested in Lipetsk. Like armored vehicles, none entered mass production. Instead, they were tested, modified, commented upon, and information sent back to Germany. As Speidel commented, this policy was shown wise in light of the "relentlessly progressive development of tactics and technology" that continued throughout the interwar period.¹⁶⁸ Unlike the Soviets, the Germans began mass producing most of their vehicles and aircraft used in the first stages of the war between 1933 and 1935, meaning some, like the BF 109 and Mark IV Panzer, were at the optimal phase of their development when the war began.

Wilberg, who headed the secret German Air Staff and had Seeckt's complete support, had the power to push these changes. Not only did he hope to begin technical testing immediately, he proposed a vast technical testing program for the following summer, including new bomb prototypes, gun scopes, a new fireproof gas tank, high-altitude oxygen tanks, military camouflage, prototype ski runners for landing the aircraft

¹⁶⁷ Zeidler, p. 169; Thomas Menzel, "Deutsche Fliegerschule: Geheimvertrag mit der Roten Armee [German Flight School: Secret Agreement with the Red Army]," September 18, 2007, *Der Spiegel Online*, <http://www.spiegel.de/einestages/deutsche-fliegerschule-a-947671.html>

¹⁶⁸ Speidel, p. 30.

on snow, several types of aviation machine guns and new ammunition types that were soon to enter development in Germany.¹⁶⁹

Unlike at Kama, where corporate engineering teams played the major role in technical developments, the Reichswehr managed and supervised all of the technical work conducted at Lipetsk.¹⁷⁰ Within the Reichswehr Weapons Office (Waffenamt Prüfwesen), Bureau 8 – the “statistics” bureau – was secretly responsible for aviation development. This group was well represented at Lipetsk: in 1931, there were six Wa.Prüf 8 team members at Lipetsk, five of whom had engineering backgrounds.¹⁷¹ The German testing group was officially organized as a *Versuchsgruppe* [research group] under the Weapons Office in 1928.¹⁷² This team was headed by Wilhelm Wimmer, a future Luftwaffe General who would be responsible for the Luftwaffe’s building program between 1936 and the outbreak of the war. When necessary, the Wa.Prüf.8 team was supplemented by commissioning civilian aviation engineers and then dispatching them to Lipetsk. Captain Roluf Lücht, for instance, worked as an engineer for the German aviation firm Rohrbach after the First World War. In 1926, he joined the Reichswehr as a

¹⁶⁹ “Ergebnis der Besprechung über das Programm der Schule Lip 1925-1926 [Results of the meeting regarding the Program of the School at Lipetsk, 1925-1926],” November 14, 1926, RH/2/2293, BA-MA, pp. 3-4.

¹⁷⁰ Some German companies were willing assistants to the research process at Lipetsk. As was the case with radio technology at Kama, they occasionally provided copies of their technology directly to an engineer headed to Lipetsk. For instance, Messter Technik GmbH, a film company that was also developing special cameras for aviation observation, provided their device to a German engineer named Johannesson, who had been in Russian off and on since 1924. He brought their equipment to Lipetsk, where it was handed over to an engineer named Wilke.

¹⁷¹ “Bericht T-3 V[ersuchsgruppe], [Report from Section T-3 Research Group],” May 22, 1931, RH12/I/57, 298, BA-MA, p. 1.

¹⁷² Zeidler, p.337.

technical adviser and was dispatched to Lipetsk.¹⁷³ The research team also had at its disposal a much larger group of aviation specialists: in 1932, their Russian and German staff included a number of engineers, twelve aircraft mechanics, five hangar staff, six armorers, four bomb specialists, three pyrotechnical experts and a three-man demolition squad.¹⁷⁴

The list of equipment they tested at Lipetsk was immense. The Wa.Prüf.'s stated priorities before the 1930 season centered on aviation radios, aviation glasses, targeting scopes and light-weight cameras.¹⁷⁵ But once the summer began, the list of experiments and design work grew rapidly. They tested monitoring and precision instrumentation to allow for night bombing.¹⁷⁶ They added a new "lap parachute design" to testing in July.¹⁷⁷ A type of heavy machine gun manufactured by Söda – borrowed from Kama and as it turned out, too heavy for aircraft – also began technical modification at Lipetsk in 1930. Wa.Prüf.8 staff further listed technical work on targeting devices, reflex sites, bombing equipment, cameras, MG mounts, and three types of bomb shells in their weekly reports. Some of these projects involved working with a "Russian commander of engineers" and his team.¹⁷⁸ The German and Russian engineers on site also traveled to Tomka to conduct chemical aviation tests with "10 and 50 kg chemical bombs."¹⁷⁹ The

¹⁷³ "Besprechungsprotokoll vom 20.12.1932 [Meeting Transcript from December 20, 1932], December 20, 1932, RH/12/I/60, 141-149, BA-MA, p. 1.

¹⁷⁴ "Stellungnahme zu den Ru. Vorschlägen," January 18, 1932, RH12/I/60, pp. 23-35, BA-MA, p. 3.

¹⁷⁵ "Anlagen 1-4, Fl. Bericht Nr. 269 [Annex 1-4 for Flight Report 269], April 10, 1930, RH 12/I/57, 23, BA-MA, p. 1.

¹⁷⁶ "Besprechungspunkte mit General v. Mittelberger [Conversation with General von Mittelberger]," RH12/I/57, 157, November 18, 1930, BA-MA, p. 1.

¹⁷⁷ "Fl. Bericht Nr. 285 [Flight Report Number 285]," July 31, 1930, RH 12/I/57, 77, BA-MA, p. 2.

¹⁷⁸ The following summer, "joint testing" included altimeter designs, a "chronograph for measuring ballistic tests," an RPM counter, and half a dozen other devices, mostly precision instrumentation.

¹⁷⁹ "Stellungnahme zu den Ru. Vorschlägen," January 18, 1932, RH12/I/60, pp. 23-35, BA-MA, p. 3.

1930 research program represented a vast investment of capital and expertise in advancing aviation technology.¹⁸⁰ It would be followed by similar programs in 1931 and 1932, and limited research work in 1933. On the whole, research at Lipetsk advanced German aviation knowledge by years, proving a boon when rearmament began in full in 1935.

WARPLANE TESTING

Of course, aviation weapons and instrumentation were only part of the ongoing technical work at Lipetsk. Essential to German goals was the testing of new aircraft designs. As it turned out, the real value of these prototypes, like the work done on tanks at Kama, was the critical training they provided to German aircraft engineers. Most of the designs would not see mass production, but the constructive failures these prototypes embodied provided essential practice, experience and ideas to young engineers who would come to dominate the German aviation industry in the 1930s.

Beginning in 1923, Wilberg, his subordinate Kurt Student and the Reichswehr Ordnance Office began a multi-stage program of aircraft production to begin in 1923. In

¹⁸⁰ The work conducted at Lipetsk provided a considerable boost to German aviation experimentation. In conversations in 1932, the Reichswehr noted that German aviation firms had a vast array of exotic projects under way back in Germany, including a “windmill plane” (helicopter) under development by Folke-Wulf, a wireless image transmission device, remote controls, an engine that could run on “crude oil” rather than the more expensive aviation fuel, a super-high-altitude aircraft designs (“the stratosphere plane”), and an electronic bombing discharge bay. In addition, the Germans were also ahead of the Allies in radar technology (technically superior but less “operationally advanced”) until 1940. Clearly, military aviation in Germany was regaining its technical edge. “Protokoll der Besprechung zwischen Herrn Alksnis und Herrn Molt am 26.3.1932 in Mo. [Minutes of a meeting between Herr Alksnis and Herr Molt on March 26, 1932 in Moscow],” March 26, 1932, RH12/I/60, 63-71, BA-MA, p. 7; Beyerchen, “From Radio to Radar: Interwar Military Adaptation to technological change in Germany, the United Kingdom and the United States,” p. 276.

the first stage, they laid out basic design principles for four types of aircraft: a daytime fighter, a nighttime fighter, a reconnaissance plane and a long-range bomber.¹⁸¹ That year, they contacted four firms: Arado, Albatros, Messerschmitt and Heinkel. The expectation was that each company would produce a handful of prototypes for testing and redesign.¹⁸² According to their plans, all testing would be conducted by 1928. At that juncture, the Ordnance Office would issue a new set of specifications based on the results of technical testing. A second generation of aircraft would be designed by 1931 or 1932, and then enter mass production. By 1933 or 1934, German air power would be restored.¹⁸³

Lipetsk was to be the home of these prototype aircraft. The Reichswehr had initially hoped to use the J-21s built by Junkers at Fili for both testing and training, but the low standard of these aircraft had led to an agreement with Fokker instead. As a result, the first 100 aircraft to arrive at Lipetsk were all of Dutch manufacture. The first fifty were the reliable Fokker D-XIII single seater fighter, which arrived in Leningrad in mid-June 1925.¹⁸⁴ These were not of particular interest from a technological angle to either the Germans or Soviets. But in 1925, Heinkel won a secret contract for prototype development of Wilberg's fast reconnaissance biplane, named the Heinkel HD-17. It was this aircraft that would be the first German prototype to arrive at Lipetsk in 1926.¹⁸⁵ The other aircraft commissioned between 1924 and 1928 failed to meet Reichswehr

¹⁸¹ Homze, p. 25.

¹⁸² Each firm produced multiple prototypes, leading to competition for Reichswehr contracts.

¹⁸³ Homze, p. 25.

¹⁸⁴ "15 sego Iunia Ya predstavatelya Nemskoi Gruppi Lip. [On the 15th of June I took a Group of Russian Representatives to Lipetsk]," June 17, 1925, p. 1.

¹⁸⁵ "Betr: Ausbildung Lehrgang L 1927," November 20, 1926, RH/2/2299, 62, BA-MA, p. 1-6.

specifications, and so were not tested at Lipetsk. As a result, in 1930, the training program still depended on these now-obsolete biplanes.¹⁸⁶ At that juncture there remained in working condition 31 Fokker D-XIIIs, four HD-17s and 2 very old Fokker D-VIIs at Lipetsk.¹⁸⁷

Contrary to Wilberg's and Student's ten-year plan, extensive prototype testing would not get underway until 1930. In the 1930s, Historian Edward Homze estimated it took four years to "develop an aircraft from design to series production" and "five to seven years" to develop an aircraft engine."¹⁸⁸ The first four prototypes contracted for in 1924 were all manufactured with World War I-era engines. This meant that they were underpowered or well behind foreign designs. But by that point, German industry had finally begun to produce a domestic aviation engine in the "1,000 h.p. class suitable for modern military aircraft," the BMW VI series.¹⁸⁹ As a result, new specifications were released in 1929 with much higher technical requirements.

These more advanced second generation prototypes were put through their paces at Lipetsk. Gorlov lists seven aircraft designs that underwent trials at Lipetsk from 1930 to 1933. But combining German and Russian archival sources, it appears fourteen distinct models of aircraft from six different aircraft manufacturers underwent trials at Lipetsk.

¹⁸⁶ These figures are for the start of the 1931 season, so the aircraft that were still functioning for training purposes at the end of the 1930 year.

¹⁸⁷ At some point between 1928 and 1930, there also arrived for testing and use a Rohrbach Roland VIII and a F-13, both commercial aircraft in use with Luft Hansa.

¹⁸⁸ Homze, p. 26.

¹⁸⁹ Homze, p. 27. In part because of the limitations imposed by Versailles, the BMW VI engine was the only domestic aviation engine that met the basic requirements of military aviation built in Germany between 1922 and 1935. All of the other engines used in German planes were produced under license agreement.

The participating firms included Arado, Albatros, Dornier, Heinkel, Junkers and Rohrbach.¹⁹⁰ If one excludes the firm of Messerschmitt AG, which had gone bankrupt and would only be reconstituted in 1933, these six companies produced 98 percent of Germany's combat aircraft in World War II. The only other manufacturer then in existence that did not participate in testing at Lipetsk was Henschel.¹⁹¹

Each firm was made aware that their designs were being secretly purchased by the Reichswehr for illegal testing at a secret flight school in Russia. Ernst Heinkel, head of the Heinkel firm, recalled his introduction to Lipetsk:

When I returned to Warnemünde from Sweden, I was told that a certain visitor [Kurt Student] wished to see me. When I met him, he didn't introduce himself....in spite of his civilian clothes, I felt from the outset that he was a military man. He made it a condition that our talk should be kept in confidence. After our first conversation, it still was not clear whom he really represented. Only some time later I understood who he was and the real reason for his visit... Wilberg headed the Reichswehr Aviation Department. He made a trip to Russia to study the possibility of training pilots there using airplanes built secretly in Germany. At the time, I could not understand why the visitor asked whether I would be able to make a landplane with a speed of 220 km/h and ceiling of 6000 meters, which could be employed as a short-range reconnaissance aircraft. I asked him what financial resources he had. The man smiled and said that he was ready to buy such an airplane immediately after it was built. After a bit of thought, I agreed. Thus, from 1923 on I became a participant in providing armaments for the German Army....The HD 17, my first airplane for the Reichswehr, had to be built in secrecy, playing cat-and-mouse with the Allied Commission on Aircraft Construction. The game was extremely dangerous for me. I could lose all or find myself under strict surveillance and constant supervision. I think fortune was on my side.¹⁹²

¹⁹⁰ Albatros would merge with Focke-Wulf in 1931. The mass-produced FW-190, among other designs, was managed by a former Albatros designer Kurt Tank.

¹⁹¹ Most of Henschel's limited aircraft production during the Second World War was of other company's designs under license agreement. JR Smith and Antony L. Kay, *German Aircraft of the Second World War* (London: Putnam Publishing, 1972), pp. 11-12.

¹⁹² Ernst Heinkel, *Stormy Life: Memoirs of a Pioneer of the Air Age*, edited and translated by Jürgen Thorwald (Boston: Dutton Press, 1956), pp. 72-73. Cited in D.A. Sobelev, D.B. Khazanov, *The German Imprint on the History of Russian Aviation* (Moscow: RUSAVIA, 2001).

Heinkel was kept informed of the testing and results of the developments at Lipetsk.

When the next round of specifications for combat aircraft prototypes was released by the Weapons Office in 1929, Heinkel was expected to modify his aircraft accordingly. Unlike Kama, German aviation firms played a relatively passive role in the experimental program, but nonetheless, their designs were shaped in a major way by this technical testing.

The flight testing itself was performed in combination by Wa.Prüf.8's research group and a collection of test pilots who began to arrive at Lipetsk in 1930. They were also joined by a handful of civilian engineers and contractors.¹⁹³ Among the pilots who arrived to test fly at Lipetsk were several of Germany's most famous aces. This elite group included Emil Thuy, a Pour le Merité recipient and ace with 35 kills to his name.¹⁹⁴ He was joined by at least three others, including Carl-August von Schoenebeck, a World War I ace and test pilot for Dornier, Heinkel and Arado, who arrived in Lipetsk in 1930 as a private citizen. The Soviets described Schoenebeck as "the best pilot, the leader of the fighter pilot group."¹⁹⁵ Their main duties involved test-flying the array of aircraft that would soon begin to arrive.

¹⁹³ The Soviets recorded only two business representatives at Lipetsk in 1930. They were businessman and future Luftwaffe General Gottfried Reidenbach and pilot-engineer Ernst Bormann. Both were former German Imperial Air Service Officers and future Luftwaffe generals. Both men served in technical capacities in the Luftwaffe during the war. "O buivshem 4-m Nemetskom Aviaotriade, Lipetskoi Gorodskii Otdel MGB Voronezhskoi Oblasti [Report on the former 4th German Squadron, Lipetsk City Department of the MGB in the Voronezh Region]," p. 7.

¹⁹⁴ Biographical information from Norman Franks, Greg Van Wyngarden, *Fokker D VII Aces of World War I, Part 2* (Oxford, UK: Osprey Publishing, 2004) p. 34.

¹⁹⁵ "O buivshem 4-m Nemetskom Aviaotriade, Lipetskoi Gorodskii Otdel MGB Voronezhskoi Oblasti [Report on the former 4th German Squadron, Lipetsk City Department of the MGB in the Voronezh Region]," p. 14. The author also added the Schoenebeck was a fascist and "very hostile to Soviet power."

The first to arrive in the 1930 season were the Albatros L-76, L-77 and L-78. These were “reconnaissance” biplanes that had the speed and armament to perform as two-seater fighters.¹⁹⁶ Arriving at Lipetsk in 1930, they were tested with bombs, 7.9 mm machine guns and also dispatched to Tomka for use in gas warfare testing. The life of a test pilot was always a risky one, especially when the designs in question were prototypes without even limited flight time to their records. On June 11, 1930, Emil Thuy took up a L-76 for a test flight. The aircraft experienced mechanical failure and crashed, killing Thuy. Despite this setback, testing continued on the Albatros line, which would evolve into the L-101 trainer. When Albatros merged with Focke-Wulf in 1931, Kurt Tank, who helped test the Albatros two-seaters, became the head of the Focke-Wulf fighter design program.¹⁹⁷ His first project, an updated version of the L-78, was known as the Fw-44.¹⁹⁸ Tank’s design team would eventually produce the Fw-190, the Luftwaffe’s main fighter aircraft in the opening phases of the war.

More than half the aircraft that underwent testing after 1930 were modified versions of the earlier prototypes updated with the powerful BMW VI engine.¹⁹⁹ Among the new designs that arrived in 1930 were the HD-21 and Heitag Arado SD 1 single seat fighter, the first illegal fighter design produced in Germany.²⁰⁰ In 1931, new arrivals

¹⁹⁶ “L-76,” and “L-78,” *German Aviation, 1919-1945 Digital Library*, March 2015, <http://www.histaviation.com/>

¹⁹⁷ Smith and Kay, pp. 173-175.

¹⁹⁸ Ibid, p. 155.

¹⁹⁹ See Smith and Kay.

²⁰⁰ “Besprechung zwischen F. und M in L. [Conversation between F[elmy] and M[olt]],” November 17, 1930, RH12/I/57, 113, BA-MA, p. 1. “Fl. Bericht Nr. 281 [Flight Report Number 281],” July 3, 1930, RH12/I/57, 59, BA-MA, p. 1. The SD 1 was something of a disaster, as it turned out – slow and not very aerodynamic – and it was cancelled. It did not serve as the basis for the next line of aircraft.

included the K-47 – precursor to the Junkers 87 “Stuka” dive bomber – the Dornier Merkur M 23, the Arado 64 and the Heinkel HD-38.²⁰¹ In 1932, an upgraded version of the Arado 64 arrived in Lipetsk (Ar-65), also powered with a BMW VI engine. It was accompanied by the Heinkel HD-59, and a Junkers W-34 prototype, which would also be tested by Luft Hansa through its Brazilian affiliate.²⁰² The final aircraft of that testing season would be the Dornier XI, the Luftwaffe’s first attempt at a *Schnellbomber*, a fast light bomber that could outrun intercepting fighters.²⁰³

A few of these aircraft were minor modifications away from the combat aircraft of World War II, notably the K-47. The Dornier XI would not see combat, but did serve as the first heavy bomber of the reborn Luftwaffe. Several hundred were produced.²⁰⁴ The He-59 floatplane would see action the early stages of World War II in a variety of auxiliary roles. Some of the other aircraft tested between 1930 and 1933 were biplanes and soon obsolete. Among these a few, like the Ar-65, would remain in Luftwaffe service as a training aircraft.

²⁰¹ “Bericht über die Ausbildungstätigkeit der Station im Sommer 1931 [Report over the Training Program fo the Station in the Summer of 1931],” p. 1; “Fl. Bericht No. 327 [Flight Report Number 327],” May 18, 1931, RH 12/1/57, 293, BA-MA, p. 1; “Fl. Bericht No. 327 [Flight Report Number 327],” May 18, 1931, RH 12/1/57, 293, BA-MA, p. 1. The Dornier Merkur M-23 should not be confused with the D-XXIII Bomber. The M-23 was an updated version of the Dornier Merkur transport aircraft series, also equipped with a BMW VI engine.

²⁰² “Stellungnahme zu den Ru. Vorschlägen,” January 18, 1932, RH12/I/60, pp. 23-35, BA-MA, p. 2.

²⁰³ “Protokoll der Besprechung zwischen Herrn Alksnis und Herrn Molt am 26.3.1932 in Mo. [Minutes of a meeting between Herr Alksnis and Herr Molt on March 26, 1932 in Moscow],” March 26, 1932, RH12/I/60, 63-71, BA-MA, pp. 1-2; “Stellungnahme zu den Ru. Vorschlägen,” January 18, 1932, RH12/I/60, pp. 23-35, BA-MA, p. 2.

²⁰⁴ 372 of the Do 11 were made by 1935. Another 282 of the Do 23, its direct descendent, would also be manufactured. Both would see combat during the war, though the design was not particularly successful.

The entire German aviation industry in 1929 consisted of “eight airframe and four engine plants” owned by seven companies.²⁰⁵ The number of designers who would craft the warplanes of the Second World War was small, and nearly all of them were involved in the prototypes tested at Lipetsk. Indeed, those prototypes constituted, in several cases, the first time future lead designers worked on combat aircraft. For instance, Hermann Pohlmann, who would later design the Ju-87, had his first two designs, the K-47 and W-34, tested at Lipetsk. He would retain components (like the tail) of the K-47 that had proved successful at Lipetsk in his famous dive bomber.²⁰⁶ Another powerful example of the flight school’s influence was the Bf 109, the main German fighter of the war and the second-most produced aircraft of all time. Its specifications were drawn up by Reichswehr officer Wilhelm Wimmer, former head of the Lipetsk research team in 1933.²⁰⁷ That same year, Willy Messerschmitt took up the project, assigning chief designer Walter Rethel to head the project. One of Rethel’s first projects, the Fokker VII, was stationed at Lipetsk. As chief designer, he drew up the Arado 64 and 65, both first tested at Lipetsk.²⁰⁸ The Bf 109 project also helps to illustrate that future Luftwaffe Weapons Office staff also learned valuable lessons from their time at Lipetsk. In 1933 and 1934, they drew up their specifications for the main line day and night fighters, light bombers, dive bombers, bomber-fighter and reconnaissance aircraft used by the Luftwaffe in World War II from the testing done at Lipetsk.

²⁰⁵ Homze, p. 26.

²⁰⁶ Mike Guardia, *Junkers Ju 87 STUKA* (Oxford, UK: Osprey Publishing, 1924), p. 7.

²⁰⁷ Smith and Kay, p. 17.

²⁰⁸ *Ibid*, p. 17.

THE RUSSIANS AT LIPETSK

Lipetsk remained throughout its operation the most “German” facility in the Soviet Union. It had the largest German staff and the greatest independence of action and management. Nonetheless, Lipetsk played an important role for the Soviet Air Force. To begin with, numerous Soviet mechanics and pilots trained at Lipetsk. The number of mechanics and support staff who received some training from the German side was considerable, numbering in the hundreds. Besides support staff, a number of Soviet pilots also studied at Lipetsk, though in smaller numbers than their German counterparts. In the 1927 summer program, for instance, the 140 German pilots and engineers present were joined by 20 Soviet pilots-in-training and 24 more experienced test pilots.²⁰⁹

But as elsewhere, many of the pilots and technicians who studied alongside the Germans would succumb to Stalin’s purges. The real value gained by the Soviets was technical. The initial agreement for the foundation of Lipetsk provided for the exchange of aircraft technology at Lipetsk. For the first five years of Lipetsk’s operation, Baranov and the VVS were attempting to build a major aviation industry nearly from scratch. Lipetsk commandant Mohr wrote after a visit from a senior Red Air Force officer in 1930 that the officer had told him

We Russians up until now have had to deal with primitive human material. We are forced to adapt our aircraft to the type of pilot in command. Our technical development of materials will be perfected only to the extent to which we are able to create a new type of man. Both factors are interdependent. You cannot put primitive people in complicated machines.²¹⁰

²⁰⁹ Ianis Berzin, “Kept in Secrecy: Information about Lipetsk,” January, 1929, f. 33987-3-295, l. 81, RGVA, p. 1, reprinted in Dyakov, Bushuyeva, p. 157.

²¹⁰ Speidel, p. 38.

Building “new men” and new aircraft was the Soviet goal. By 1930, the VVS was beginning to succeed on both marks. That year is generally taken to mark the beginning of the “Golden Age of Soviet Aviation,” where Soviet designers began to produce the world’s most innovative and cutting edge prototypes. Soviet pilots like Valery Chkalov, the first to fly over the North Pole, performed daring feats that captivated the world. And the VVS enjoyed the enormous largesse of the first two Five Year Plans, expanding massively.

But reaching that apogee required enormous exertions by the VVS. In 1930, German officers at Lipetsk reported back to Berlin that they heard growing rumors about an “intensive new rearmament effort of the Soviet Air Force.”²¹¹ They reported the following details: all future Soviet army aircraft would be made of metal; the Soviets were vastly expanding their light and heavy bomber fleets; and that the new generation of Soviet fighter aircraft seemed to have specifications better than contemporary German prototypes.²¹² The photos included with the intelligence report made clear to the report’s author that the Soviets were stealing design intelligence from around the world for their own purposes. Specifically, he noticed that a new Soviet fighter design “vividly recalls the American Curtiss fighter...[but that aircraft is of course not in the USSR].”²¹³ They added that other design components appeared to have been borrowed from Fokker aircraft already in use in the Soviet Union. Their observation was astute: from 1925 to 1930, nearly every Soviet aircraft design was derivative of foreign designs. To “catch up”

²¹¹ “Neue Kriegsflugzeuge in der SSSR [New Warplanes in the SSSR],” June 16, 1930, RH12/I/56, 331, p. 1.

²¹² Ibid, p. 1.

²¹³ Ibid, p. 3.

with western aviation technology, the Red Air Force depended upon legal acquisition of technology through purchases and license agreements.²¹⁴ Failing that, the Soviets used industrial espionage and reverse engineering of stolen designs to remedy their own shortcomings. The facility at Lipetsk was immensely important for both legal and illegal routes.

Beginning in 1930, large Soviet delegations of engineers from TsGASI, the main aviation institute in Moscow, began to arrive in Lipetsk. They were often accompanied by test pilots. Under the terms of the agreement at Lipetsk, they were allowed to “inspect and study the material available” but also take any aircraft or equipment present up for a test flight. They began doing this with some frequency when the new Germans began to arrive in numbers in 1930. Speidel noted that the TsGASI representatives demonstrated “an amazing mastery of individual technical areas.”²¹⁵ He also noted that they were carefully coached to “avoid revealing surprise, recognition, doubt, rejection, or similar subjective opinions though posture of facial expressions. The mask never fell.”²¹⁶ This was to avoid, in part, revealing the engineers’ familiarity with German technology.

When license agreements and purchase contracts could not fulfill Soviet desires for German technology, espionage often did. The Germans were aware of the frequent “borrowing.” Some critical pieces of technology never traveled to Lipetsk specifically because of German fears regarding their theft. In negotiations with Moscow Center,

²¹⁴ The first example of a major aviation purchase dates to 1923, when Soviet air force bought 25 of Junkers advanced F-13 monoplanes. Lutz Budrass, *Flugzeugindustrie und Luftrüstung in Deutschland 1918-1945* (Düsseldorf: Droste Verlag, 1996), p. 182.

²¹⁵ Speidel, p. 38.

²¹⁶ *Ibid.*, p. 38.

Baranov, Alksnis or Voroshilov often mentioned technologies mentioned in newspaper articles and then demanded an explanation why the Germans were not testing them at Lipetsk. One in particular which they requested information about repeatedly was “wireless image transfer” technology that would allow photographs to be sent instantly from an aircraft to a receiving station. But the Germans insisted repeatedly that “the technology is not ready.”²¹⁷ It would never be ready, at least for testing in Russia.

By 1930, the Germans suspected espionage on every component part they brought with them to Lipetsk. These fears proved, for the most part, justified. Most of the parts for the Wa.Prüf. 8 group’s technical tests were kept “in a small wooden shack... aircraft instruments were frequently found moved around, sometimes damaged or not working.”²¹⁸ The German engineers suspected that the Russians were sneaking into the storage facility at night to disassemble and map the component parts of each device in order to reverse engineer them.²¹⁹ A number of schematics also disappeared from a German office at Lipetsk during the summer of 1931. The German engineers reported that “The request of the research group at WIVUPAL regarding the investigation [of stolen technical plans] has not yet been answered... the theft was probably ordered by the Russian Air Force.”²²⁰ German suspicions regarding the importance of “spying” to Soviet aviation developments were confirmed in the early 1930s. While team after team of Soviet technical experts arrived at Lipetsk, no completed, modern Soviet designs

²¹⁷ “Notizen aus dem Protokoll der Besprechung vom 22.11.31 zwischen Alksnis, Feodorof, Hoffmeister und Niedermeyer [Notes from the Transcript of the Conversation on November 22, 1931 between Alksnis, Feodorof, Hoffmeister and Niedermeyer],” November 22, 1931, RH12/I/61, p. 2., BA-MA, p. 2.

²¹⁸ “Aktenvermerk [Memo],” January 9, 1932, RH 12/I/60, 18, BA-MA, p. 19.

²¹⁹ Ibid.

²²⁰ Ibid.

appeared at the facilities. During German tours of Soviet airbases elsewhere, the Soviets generally prevented the Germans from seeing their new aircraft. Speidel complained that every time the Soviets agreed to a demonstration flight of a new aircraft, “at the last minute it was always prevented by unforeseen circumstances.”²²¹ The aircraft they were allowed to see, and fly if desired, were always “museum pieces.”²²² By the early 1930s, the Germans knew why: the Soviets were unwilling to reveal how much they had borrowed from German designs.

These thefts undermined the Reichswehr-VVS relationship. Besides German anger at Soviet audacity, it complicated the Reichswehr’s relationship with its corporate partners. As noted, many German companies were dispatching equipment for testing at Lipetsk. Those that did not have representatives in Russia required a Reichswehr “commitment ... over the confidentiality of their transferred equipment.”²²³ While the Soviets had been allowed to inspect equipment since 1925, the outright theft of German products cut into German corporate sales. Pressure at home led Moscow Center to issue a change of policy to the Soviets in 1932, stating that “German firms have patent rights; we must reject the copying or photographing of equipment as well as the disassembly of these devices.”²²⁴ But by that juncture, much of the damage had been done. This technical “borrowing” played a major role in the rapid ascent of the Soviet Air Force in the 1930s.

²²¹ Speidel, p. 39.

²²² Ibid.

²²³ “Aktenvermerk [Memo],” January 9, 1932, p. 19.

²²⁴ “Stellungnahme zu den Ru. Vorschlägen,” January 18, 1932, RH12/I/60, pp. 23-35, BA-MA, p. 1.

CONCLUSION

The process of closing the facility at Lipetsk proved awkward because of the facility's large size and the quantity of technical equipment. The issue of industrial espionage continued to haunt the facility: in the last few months of Lipetsk's operation, an unknown assailant shot one of the guard officers on duty in a suspected case of technical theft, further heightening tensions.²²⁵ But despite tensions, on July 11, 1933, the "liquidation process" began smoothly. The last aircraft departed for Germany, as did the Versuchsgruppe's mountains of materiel. But much could not be returned to Germany, from Lipetsk's pre-fab hangars to its engine testing equipment. As a result, the VVS inherited a bounty of some 2.9 million Reichsmarks worth of technical material.²²⁶

The total windfall for each side from Lipetsk amounted to much more than a few million Reichsmarks, however. Wilhelm Speidel would write, reflecting on his time at Lipetsk, that "the spiritual foundations of the future Luftwaffe were developed on that aeronautical field."²²⁷ It was clear to him that "Lipetsk was the most important center among the army bases on Russian soil."²²⁸ Not only was the core of the soon-to-be-reborn Luftwaffe trained or retrained at Lipetsk, but German aviators completely rewrote tactical and operational doctrine while at Lipetsk. Speidel put it rather poetically when he wrote that

The geographical, political and professional narrowness of Germany during that period sunk behind the pilots at Lipetsk. In the vastness of Russian space, they knew neither danger nor impossibilities... there were tremendous opportunities to

²²⁵ Speidel, p. 40.

²²⁶ Gorlov, p. 305.

²²⁷ Speidel, p. 28.

²²⁸ Ibid, p. 20.

create the new, a rare chance that only arises for soldiers when their inherited foundations have become doubtful.²²⁹

In those wide open horizons, Lipetsk's fighter pilot instructors literally rewrote the German manual on aviation warfare. In 1929, they compiled a

fighter manual (Jagdfliegervorschrift) which comprised a complete schedule of training, including air-drill regulations, close- and open-formation flying, aerobatics, high-altitude flying, aerial combat tactics, and air-to-air and air-to-ground gunnery and bombing practice.²³⁰

Some of the ideas it contained were unique to the experience at Lipetsk. In particular, the tactical exercises performed alongside the Russians above the nearby Voronezh base had proved influential. While the Russians "borrowed" technology from the Germans, the Germans – though few would admit it – had borrowed ideas from their Russian counterparts:

The Red Army's strong emphasis on close air support for ground forces impressed many German officers, and much of the later German thought about the use of fighter-bombers and assault aircraft can be traced to their Russian experiments.²³¹

Speidel argued that the experience of flying at Lipetsk drove operational and tactical thinking beyond the "limited scope of pure theory" which would have been the case had training been limited to German airspace.²³²

Germany had also succeeded in training a large cadre of future officers. Most of the major figures of the Luftwaffe in the Second World War either trained at Lipetsk, visited Lipetsk or were trained by someone who had studied there. The pilots from

²²⁹ Speidel, p. 28.

²³⁰ Homze, p. 21.

²³¹ Ibid, p. 21.

²³² Speidel, p. 43

Lipetsk “formed the experienced cadre for the subsequent Air Force of Great Germany Empire.”²³³ Some of the aces who graduated from Lipetsk have already been noted. But Lipetsk’s real influence was upon the middle and upper ranks of the Luftwaffe. From 1935 until 1945, twenty-two officers who achieved the rank of *General der Flieger* in the Luftwaffe had either studied, taught, or commanded the facility at Lipetsk.²³⁴ A large number of others associated in some way with its activities back in Germany. Nearly every senior flight officer in 1935 had connections to Lipetsk.

The technical program also proved to be of tremendous value to Germany’s aerial resurgence. As there was nowhere else to fly aircraft intended for combat, every prototype developed before 1933 traveled through Lipetsk: “all final acceptance tests [of prototypes] were performed at Lipetsk for security reasons.”²³⁵ The results of these tests were then used to refine the next generation of aircraft. German engineers responsible for Germany’s main combat aircraft learned essential lessons from the prototype designs tested at Lipetsk. The Luftwaffe saved at least four years of research and development by initiating its technical program in 1924, allowing for three generations of military aircraft to be developed, tested, flown, and remade before the outbreak of the Second World War.

For the Soviets, Lipetsk played a similar role to the facilities at Kama and Tomka. They gained immense quantities of technical knowledge. Most Soviet aircraft designs from 1925 to 1930 were derivative of German or other foreign designs. The arrival of

²³³ Cordts, p. 17.

²³⁴ This figure appears to be about a quarter of the total number of men elevated to that rank during the war. Most of the Lipetsk alumni reached that position earlier, rather than their peers, further highlighting the school’s influence.

²³⁵ Homze, p. 25.

German technical experts in 1924 sped the process of reverse engineering and imitating foreign engines and airframes. So did the plentitude of technical equipment to which the Soviets had access at Lipetsk. In human terms, the number of Soviet pilots and mechanics trained alongside the Germans seems to have been about as large as the number of Germans trained. But their futures were unclear. The Red Air Force suffered as badly as the other service branches of the RKKA between 1937 and 1938.

Lipetsk Air Base would play a role in training future generations of Soviet fighter pilot talent, however. After the Germans and Soviets agreed to close the facility in 1933, it was immediately converted to Soviet military use. Today, it remains one of the most important aviation training bases in the Soviet Union. And in an odd twist, it still hosts the Fourth Air Squadron, the unit name for the Germans while they were in residence. These days, that formation is a training unit for Russia's elite fighter pilots. In some ways, nothing has changed since Falck, Speidel, Lützow and others learned their deadly trade in the southern Russian skies.

CHAPTER SIX – GENTLEMEN AND REVOLUTIONARIES: SOVIET-GERMAN

NAVAL COOPERATION, 1918 TO 1941

INTRODUCTION

On October 23, 1939, Soviet naval and customs officers in the White Sea port of Murmansk witnessed a bizarre sight. Into the harbor steamed a merchant ship with the name “City of Flint” proudly painted in white on its side. But it was flying a *Kriegsmarine* flag with the Nazi swastika emblazoned at its center.¹ German sailors in naval uniform manned the deck. Where had this ship come from? The Soviets present must have wondered.

Two weeks earlier, the German Heavy Cruiser *Deutschland* had encountered the *City of Flint* in the mid-Atlantic. Knowing that to run would be suicide in the face of the 10,000-ton warship, the American captain of the *City of Flint*, a reserve officer in the US Navy, cut his engines and prepared to be boarded. A German boarding party soon arrived, and found agricultural equipment and food supplies destined for Great Britain. Declaring the cargo contraband, the *Deutschland*'s captain ordered a prize crew of three officers and eighteen enlisted men to take the ship back to Germany. Theirs was an historic distinction: they were piloting the first American vessel taken during the war.

Avoiding the British blockade fleet, the *City of Flint* sailed east, attempted to put into a Norwegian port. But the Norwegian government threatened to intern the vessel, per

¹ George Ginsburgs, “The Soviet Union as a Neutral, 1939-1941,” *Soviet Studies*, vol. 10, No. 1 (July, 1958), pp. 12-35; p. 27.

rules of maritime neutrality. Needing repairs and supplies, and fearing the presence of British ships, the Kriegsmarine lieutenant in charge decided to head for the nearest port he believed he would receive aid: Murmansk. Two months earlier, on August 23, the Soviet Union and Nazi Germany had concluded the Molotov-Ribbentrop Pact. Within a month, the navies of the two states had agreed to a broad program of cooperation: The Soviets offered Germany the use of a naval base near Murmansk, the sale of a German battle cruiser to the Soviet Navy and secret mutual assistance in commerce raiding and submarine warfare. All these measures were arranged as covertly as possible. The public arrival of the *City of Flint*, observed by neutral vessels in Murmansk harbor and reported by TASS to the world, would test the Soviet commitment to their new allies.

The Soviets immediately interned the German crew. They would spend the evening of October 24 in Soviet custody in Murmansk while Stalin and the Politburo deliberated what to do with the ship.² The stakes were high: if the Soviets released the vessel in German hands, violating their publicly stated neutrality, then the British and French might declare war. After Soviet aggression against Poland and the Baltic States in the fall of 1939, Stalin felt the Allies were on the edge of open hostilities. The *City of Flint* incident also pushed the US to the brink of conflict: the US State Department threatened that “a Soviet refusal to return the ship could be used as a basis for reclassifying the Soviet Union as a belligerent.”³ On the other hand, if the Soviets interned the vessel and its German crew per international law, they would risk the ire of

² Ginsburgs, p. 27.

³ Ibid, p. 29.

Hitler. This would jeopardize the precarious new alliance which Stalin believed spelled salvation for the Soviet Union, buying precious time to strengthen Soviet defenses.

On October 28, the *City of Flint* put to sea again.⁴ Her American crew was on board, but they remained prisoners. The Nazi emblem still flew from the stern. The Soviets had decided to walk a fine line: they had released the ship only after saying that the vessel had required emergency repairs, which allowed them to claim that they had continued to honor their neutrality. They made it clear to the Germans that they did not want prize vessels arriving in Murmansk harbor in the future.⁵ But the Germans could be reasonably pleased that they had been allowed to put to sea; cooperation on naval affairs would continue to grow over the next sixteen months, partially thanks to the Soviet response to the *City of Flint* incident.⁶

The German and Soviet Navies followed a different path of cooperation than did the armies of their respective nations. In general, the relationship can be divided into five periods: one of post-war settlement from 1918 to 1923, limited cooperation from 1923 to 1933, a burst of joint work on submarines from 1933 to 1935, hostility from 1935 to 1939, and finally, a final period of intense cooperation from 1939 to 1941. But on the

⁴ Charles Cheney Hyde, "The City of Flint," *The American Journal of International Law*, Vol. 34, No. 1 (Jan., 1940), pp. 89-95, p. 91.

⁵ Ginsburgs, p. 29.

⁶ The *City of Flint* had a very interesting voyage after its departure from Murmansk. Needing to stop for supplies and with Royal Navy vessels bearing down, it again attempted to call at a Norwegian port on November 3. A Norwegian military vessel approached the ship and interned it, detaining the German crew and freeing the Americans. The American ship then sailed out of Haugesund Harbor on their own power, while the German crew remained interned until the conquest of Norway. The American captain Joseph Gainard returned to the US a hero, receiving the Distinguished Service Cross for his protection of the crew throughout the saga. The ship would complete its voyage to the United Kingdom. The *City of Flint* would continue running in convoys throughout the Battle of the Atlantic. On January 23, 1943, the ship fell out of an Allied convoy and was torpedoed by U-575.

whole, the relationship between the *Voenno-Morskoi Flot USSR (The Military-Sea Fleet of the Soviet Union)* and the *Reichsmarine* was rockier and less productive than their army counterparts. The German Navy was extremely reluctant to engage their Soviet counterparts, due to a combination of rigorous anti-communism and a strategic vision which emphasized domination of the Baltic. In addition, the German Navy enjoyed success avoiding the Treaty of Versailles without Soviet help from 1922 to 1933, relying on a network of partners in Finland, the Netherlands, Spain, Sweden and Turkey. But despite those obstacles, interaction between the two navies would play an important role in both services. This influence took the form of officer exchanges, the purchase of blueprints and naval vessels, as well as a theoretical and technical interchange. And in the end, naval cooperation would play a major role in the Molotov-Ribbentrop pact.

THE END OF THE TSARIST NAVY

The Tsarist Navy entered the First World War still weakened from the Russo-Japanese War. The Pacific Fleet was gone. The Tsar had refused to address the underlying structural issues which had led both to the disaster at Tsushima and the Potemkin Mutiny.⁷ Despite a good commander, Admiral Nikolai von Essen, the Baltic Fleet began the war demoralized and with serious technical defects. Its performance was expected to be so poor that the entire fleet was subordinated to the Seventh Army, itself a small fragment of Russian land strength.⁸ The Black Sea Fleet, which had endured and

⁷ Donald W. Mitchell, *A History of Russian and Soviet Sea Power* (New York: MacMillan Publishing Co., Inc, 1974), pp. 271-273.

⁸ *Ibid*, p. 294.

overcome the worst of the 1905 mutinies, was in better shape. There, the officer corps had redressed discipline and enjoyed better training and fire control than the rest of the Russian Navy. In both the Black Sea and the Baltic, Russian naval strategy at the beginning of the war centered on interdicting enemy shipping and laying mines along the Baltic and Black Sea ports of the hostile powers.

With the outbreak of war, the Baltic Fleet caused some problems for German shipping, particularly to and from Sweden, the vital source of German iron ore. Indeed, a British submarine flotilla stationed at Liepaja, Revel and Hanko and operating under a Russian commander had considerable success and nearly cut off Swedish iron during a critical period in 1915.⁹ But the Baltic Fleet's subordination to army command and its extraordinarily cautious and pessimistic commanders (after von Essen died in early 1915) meant that its role was limited largely to mine laying and submarine forays.

The Russian Navy fared much better on the Black Sea. In October 1914, the Turkish Navy, led by German Admiral Souchon, attacked the Russian Navy at Sevastopol without warning before Turkey had officially entered the war. The German commander had not bothered to seek permission from his Turkish superior, Minister of Defense Enver Pasha. Other than sinking two small auxiliary vessels, Souchon's attack failed tactically, but succeeded strategically in forcing Turkey into the war on the German side.¹⁰ The next three years saw back and forth commerce raiding between the two sides. Led, from 1915, by the highly intelligent Admiral Kolchak, the Russian fleet succeeded

⁹ "Original Logs, Baltic Submarine Flotilla," 1914-1919, ADM 137-1096, 1570, British National Archives (BNA).

¹⁰ Mitchell, p. 313.

in wreaking havoc with Turkish supply lines. His subordinate commanders showed boldness, repeatedly beating German-led squadrons sent out against Russian shipping. By the end of the war, the Russian Black Sea Fleet had sunk a large number of merchant ships, plus “one cruiser, four destroyers, five gunboats and some small craft.”¹¹ Among other results, their efforts triggered a severe coal shortage in Turkey.¹²

In February 1917 – as the Tsar abdicated and the Provisional Government took power in St. Petersburg (then Petrograd) – discipline in the Baltic Fleet collapsed. Mutineers on the cruiser *Avrora* shot their commander and then helped two other ships in Helsinki Harbor to murder their officers and seize control of their ships. At Kronstadt, the primary Russian Baltic Fleet Base, 3,000 trainees rioted, killed three admirals and tortured a number of their instructors to death before seizing the vessels in harbor. By May 1917, the Bolsheviks, through ships’ committees, had effectively taken control of the Baltic Fleet.¹³ This proved of vital importance to the course of events on land, as many of the sailors would serve as shock troops in the Bolshevik Revolution in October 1917.

At sea, however, the mutinies destroyed the Russian fleet. Without officers or discipline, the ships ran aground, were captured by newly forming governments in the Baltic States, the Germans, or even the British, who sent a naval squadron to the Baltic in 1919. The remaining vessels were evacuated to St. Petersburg in a surprisingly successful tactical retreat. They comprised a still-powerful force: six battleships, five cruisers, 54

¹¹ Mitchell, p. 321.

¹² Ibid, p. 321.

¹³ Ibid, p. 329.

destroyers, 12 submarines and 134 other auxiliary vessels.¹⁴ But these vessels rapidly became unseaworthy as their crews neglected essential maintenance or disappeared into Red Army formations on land. By 1922, even with some repairs in the aftermath of the Civil War, the Baltic Fleet could only field 1 battleship, eight destroyers and a handful of other vessels.¹⁵

The Black Sea Fleet's history from 1917 was more colorful. Better led, better trained and better disciplined – as well as further from centers of mutiny – the Black Sea Fleet remained effective after the February Revolution. It was not until June 19 that Bolshevik agents managed to bring about a mutiny on the principal ships. And even then, it failed, through a bizarre twist of fate. American Rear Admiral James Glennon, a visiting American Naval Envoy, delivered a speech to 1,200 mutinying sailors and convinced them to back the provisional government, for the time being.¹⁶

Discipline only began to disintegrate in November 1917, with the Bolshevik coup. Some of the ships' crews murdered their officers, or voted them out of their positions, but others continued to obey orders. The fleet as a whole proved surprisingly resistant to the Bolsheviks. In May 1918, the surviving vessels, having sailed for Novorossiisk to avoid capture by the German Army, ran up the St. George Flag and formed anti-Bolshevik committees to maintain discipline on board. But by June 1918, the German army approached the last Black Sea port, and the Bolsheviks on land interrupted oil deliveries. Facing a critical decision, the crews of the Black Sea Fleet put their next move to a vote.

¹⁴ Mitchell, p. 334.

¹⁵ Ibid, p. 356.

¹⁶ Ibid, p. 343.

Approximately half the Black Sea fleet crews then scuttled their ships, obeying orders from the Bolsheviks. The remainder, including two battleships, a cruiser, ten destroyers and four submarines put to sea, sailed to Sevastopol and became the Naval Forces of White Russian General Denikin in the Civil War. Their final act would come in 1920, when the Black Sea Fleet ferried 146,200 refugees fleeing the Bolsheviks into exile in French North Africa. There, the once powerful ships remained, slowly decaying, until they were scrapped in 1936.¹⁷

When the dust of the Civil War had ended, the Bolsheviks possessed only a tiny fragment of the once-grand Imperial Fleet. Worse, the sailors from the Baltic Fleet mutinied *against* the Bolsheviks in February 1921, leading to a bloody battle over the Kronstadt fortress which cost nearly 5,000 casualties to suppress.¹⁸ And, even more than the army, the loss of skilled officers and technicians meant that what ships did remain were incapable of action. By 1921, the Soviet navy's total in-commission tonnage was only 16.2 percent of what the Tsarist Navy had had in 1917.¹⁹ The situation was bad enough in 1922 that Lenin debated the possibility of eliminating the navy altogether.²⁰

¹⁷ Mitchell, p. 346.

¹⁸ Ibid, p. 340.

¹⁹ Jürgen Rohwer and Mikhail S. Monakov, *Stalin's Ocean-Going Fleet: Soviet Naval Strategy and Shipbuilding Programmes, 1935-1953* (London: Frank Cass Publishers, 2001), p. 32. This is an invaluable book. Mikhail Monakov was Chief of the History Branch of the General Staff of the Russian Navy when this book appeared in 2001. It represents the most honest and accurate self-appraisal by Russian naval officers of the early history of the Soviet navy, and combines the best of Soviet, German and English language sources. Many of the Russian language sources from pre-1991 which are publicly available are deeply ideological. For instance, AK Selyanichev's *V.I. Lenin I Stanovlenie Sovetskogo Voennno-Morskogo Flota [V.I. Lenin and the Foundation of the Soviet Military-Naval Fleet]* (Moscow: Izdatelstvo Nauka, 1979), 230 pp.

²⁰ Mitchell, p. 356.

THE BIRTH OF THE SOVIET NAVY

The Workers' and Peasants' Red Fleet (*Rabochy-Krestyansky Krasny Flot*, or RKKF) was in very poor condition at its conception. What remained of the Tsarist navy deteriorated in port after the October Revolution. Many of the remaining capital ships were sold for scrap in Germany in 1922 and 1923, generating desperately needed foreign capital for other projects.²¹ But while the Tsarist fleet rusted away in harbor berths, the germ of a new navy began to grow on land. Like the Red Army, the Soviet Navy remained dominated by pre-revolutionary officers: in 1920, 80 percent of officers were holdovers from the Tsarist navy.²² In 1922, Soviet military leadership began training large numbers of loyal cadres to fill out a future Communist navy. Between 1922 and 1927, 13,000 men would undergo naval training at various depots around the country, serving as the future cadre of the Soviet Navy.²³ Given that the entire strength of the Red Fleet was only 36,929 officers and men in 1921 (and would shrink to 28,000 over the next several years), this represented a complete transformation of the navy.²⁴ And as cadres developed, 400 former imperial officers were purged from the navy's ranks.²⁵ Although material conditions had not yet improved – and the RKKF had a miniscule budget of only 8 million rubles in 1922 – on November 8, 1923, the RKKF also established the Scientific-Technical Committee to manage shipbuilding and design.²⁶

²¹ Rohwer, Monakov, p. 8.

²² Ibid, p. 8.

²³ Mitchell, p. 366.

²⁴ Rohwer, Monakov, p. 10. As of October 1928, the Central Committee required “50% of students at military schools to be workers.” The following year, it was raised to 60%. Gunnar Aselius, *The Rise and Fall of the Soviet Navy in the Baltic, 1921-1941*, (London: Frank Cass, 2005), p. 143.

²⁵ Rohwer, Monakov, p. 10.

²⁶ Ibid.

At the same time, however, the relationship with the army changed drastically. Between 1922 and 1926, the Soviet Fleet became increasingly subordinated to Red Army interests.²⁷ The RKKA took over control of coastal artillery and naval aviation from the Navy.²⁸ On July 1926, the Navy was reorganized and brought under the administration of the Red Army, effectively losing its independence.²⁹ And the RKKA's chief of staff, Mikhail Tukhachevsky, undermined proposals for the construction of an oceangoing fleet.

The major theoretical debate within the Soviet Navy centered on the type of fleet the Soviet Union should have.³⁰ Senior professor of the Soviet Naval Academy B.B. Zherve and leading theoretician M.A. Petrov, continued to push for what was known as the *old school*.³¹ They argued that the Soviet Union needed to follow the Mahanian vision of the Tsarist fleet and maintain a significant force of battleships. The *old school* contained an odd mixture of old Bolshevik revolutionaries – who believed an offensive fleet was necessary to spread world revolution – and surviving Tsarist-era naval officers who believed in a strong fleet for doctrinal and national reasons.³²

²⁷ Aselius, pp. 67-68.

²⁸ Ibid, pp. 67-68.

²⁹ Rohwehr, Monakov, p. 23.

³⁰ For the discussion of this theoretical debate and the purging of the *old school* advocates, see Robert W. Herrick, *Soviet Naval Theory and Policy: Gorshkov's Inheritance* (Washington, DC: US Government Printing Office, 1988), Chapters I (“The Dominant Old School versus the Young School” and II (“The Old School Goes Down for the Count”), pp. 1-86.

³¹ Aselius, pp. 9-13. As Aselius points out, there has been some disagreement on both terminology and the principles of the competing doctrinal schools. The three best books on the subject – Herrick's (1988), Rohwehr and Monakov's (2001) and Aselius' (2005) – all use somewhat different terminology. For simplification, I will use Aselius' terms (old and new school).

³² Ibid, pp. 57-59.

Opposed to them was the *young school* of junior officers who had been educated in the Soviet naval academy, the “young red commanders.”³³ They argued for a doctrine that paralleled British naval theorist Julian Corbett as well as the French *jeune école* (young school). Corbett had argued that maintaining total control of the seas, the Mahanian project, was impossible. Instead, the vital role of the navy was to control and safeguard the primary sea lanes. This involved a fleet of faster, lighter ships, particularly cruisers in lieu of more expensive battleships. Theophile Aube, one of the primary defenders of the *jeune école* school in France, had reached a similar conclusion. For a weak naval power, control of the seas was impossible. Instead of building capital ships, the *jeune école* argued that building a fleet of fast torpedo boats could deny the enemy control of the sea lanes. Neither Corbett nor the French *jeune école* had written their works when the submarine had demonstrated its worth. In the Soviet case, the *young school* saw in new technologies a new version of the concept: “in future wars, it was argued, the airplane and the submarine would make sea control impossible.”³⁴ The *young school* emphasized a defensive navy of patrol boats, submarines and mines to protect Soviet shores. This fit the turn in Soviet politics away from “global revolution” towards “socialism in one country” which began in 1925.³⁵

³³ Aselius, p. 139.

³⁴ Aselius, p. 12. While it might seem obvious to believe in the value of submarines after German efforts in the First World War, many theorists in Great Britain and elsewhere believed that the submarine had been defeated by changes in technology – the depth charge, ASDIC (early sonar) and the convoy system – which rendered the submarine obsolete. Faith in the use of the submarine proved to be strongest in the German, Soviet and above all, Italian, navies in the interwar period.

³⁵ Aselius, p. 117.

Tukhachevsky, then Chief of Staff of the RKKA aggressively patronized the officers of the *young school*, such as A.M. Yakimych, A.P. Aleksandrov, K.I. Dushenov and others.³⁶ He made his own opinions clear in 1924: “Tsarist Russia followed Germany. Imperialistic dreams caused the excessive development of the Navy. The involvement in the naval armament race was a fatal error for Germany, Austria and Russia.”³⁷ He wanted, and won, the operational subordination of the navy to the army and a tight limit on its budget.

The struggle between the two factions centered on budgets and shipbuilding. Advocates of the *old school* argued for the restoration of existing battleships and the construction of new capital ships: initially, four were proposed in November 1926.³⁸ *Young school* advocates proposed a much smaller and cheaper force centering on destroyers, motor torpedo boats and submarines. With Tukhachevsky’s assistance, the latter won the doctrinal battle in 1930, when the four major advocates of the *old school* were purged – two were arrested, one was forced to retire, and one was promoted into an army post as head of the military engineering academy.³⁹ As a further sign of victory,

³⁶ For instance, AP Aleksandrov wrote that potential weaknesses of blockades, when contested by submarines and minefields. This meant that capital ships and the independent bluewater navies demanded by Tsarist-era theorists like M.G. Petrov were relics of the past. Of course, Aleksandrov’s theory proved popular because of the incapacity of Soviet shipyards to build capital ships, and popular with the influential Mikhail Tukhachevsky because it justified the navy’s tiny budget.

³⁷ Rohwehr, Monakov, p. 20.

³⁸ Ibid, p. 26. This was, of course, outside of the capabilities of the Soviet economy at the time. One of the reasons for the success of the *young school* was its greater practicability. During the purges, *young school* advocates would be accused of pessimism towards Soviet industrial production capabilities, which, combined with trumped-up charges of working for foreign powers, was more than enough to indict them.

³⁹ Ibid, pp. 26-27.

between 1926 and 1929, the only new vessels commissioned into the Soviet navy were submarines, MTBs and patrol boats.⁴⁰

The First Five Year Plan (1928-1932) did little to alter the navy's position. As David Stone has shown, the navy lost out in the budgetary battles over the First Five Year Plan, seeing its funding decrease while the rest of the military increased.⁴¹ Spending was devoted to air force and army production, not new ships. At the same time, the *young school* doctrine was formalized into BU-1930, the battle manual for the Red Navy. It argued that the Soviet navy had three roles: supporting army operations, defending the Soviet Union's coasts and controlling the seas, rivers and lakes along the country's borders.⁴² In a sign of the times, Old Bolshevik Romuald Muklevich, who had been appointed to take over the navy from head of the RKKF Admiral Zof, argued for a "balanced fleet" with greater projectable power.⁴³ In 1931, he pushed for the construction of several battleships, for which he was removed from his post.⁴⁴

While the navy received significant new resources in the Second Five Year Plan (1933-1937), these were largely devoted, as *young school* doctrine advocated, towards submarine production. An astonishing 369 new submarines were included in the Second Five Year plan, which would have made the Soviet submarine force by far the largest in the world.⁴⁵ 1933 represented a more ambitious approach to naval policy, although *Young*

⁴⁰ Rohwer, Monakov, p. 24. It is interesting to note that the three submarines, which were among the most technically proficient of the 1920s, were based on purchased Italian designs. Also, it should be mentioned that older ships were refitted and repaired, such as the battleship Murat.

⁴¹ David R. Stone, *Hammer and Rifle*, p. 125.

⁴² Rohwer, Monakov, p. 29.

⁴³ His requests seem to have been driven by a desire to strengthen the navy vis-à-vis the army.

⁴⁴ Rohwer, Monakov, p. 31.

⁴⁵ *Ibid*, p. 47.

School advocates remained firmly in charge of doctrine. But the Soviet fleet did lay down the hulls of new cruisers and destroyers for the first time since the revolution and established an “Arctic Fleet” at Murmansk-Polyarny.⁴⁶ And despite material shortages, and a lack of skilled labor and engineers, the Soviet Navy managed to increase its submarine force from 21 in 1930 to more than 150 operational vessels in 1940, a remarkable achievement.⁴⁷

While the navy’s theorists and staff had largely accepted a secondary role to the army, outside advocates of a new “*Soviet school*” began to emerge within the Soviet bureaucracy.⁴⁸ They envisioned a powerful navy with a large number of capital ships which could – in Mahanian terms – win a decisive fleet-to-fleet battle, but also sustain “successive combined operations,” such as commerce-raiding and interrupting a blockade.⁴⁹ Proponents came from a number of areas, mostly outside the navy. Crucially, in 1933, two advocates of the new concept wrote a book on “naval competition between Great Britain and the United States since the Washington Conference of 1922,” arguing that the battleship was a vital component of national power.⁵⁰ Despite being fiercely criticized by Muklevich’s successor V.M. Orlov, the work found one major advocate:

⁴⁶ “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” 1947, *Office of Naval Intelligence*, Naval Historical Collection, Naval War College (NHC-NWC), Newport, Rhode Island, P. 33. This report is compilation of primary sources taken out of Germany at the end of World War II.

⁴⁷ Mitchell, pp. 369-370.

⁴⁸ Herrick, pp. 57-61.

⁴⁹ *Ibid*, p. 57.

⁵⁰ Rohwer, Monakov, p. 42.

Josef Stalin.⁵¹ A few months later, at the XVIIth Party Congress, Voroshilov announced that Stalin “would now manage the build-up of the Navy himself.”⁵²

Change would come rapidly. In January 1935, the RKKF initiated research into capital ship construction. The Main Shipbuilding Department, now run by the capital-ship advocate Muklevich, produced five designs for ships between 43,000 and 75,000 tons displacement.⁵³ Over the course of the next year, more and more work was done on acquiring capital ship designs and armament overseas, particularly from Italy. In March 1935, Marshal Voroshilov “ordered a revision of the Baltic Fleet’s operational planning, identifying Germany as the main aggressor in the Baltic Theater.”⁵⁴ This shift away from the British and French navies required very different naval capacities.⁵⁵ On May 27, 1936, the STO approved a *Soviet school* naval construction program including a staggering “24 battleships, 20 cruisers, 182 destroyers, 344 submarines,” plus numerous auxiliary ships.⁵⁶ A few months later, Stalin organized a summit of senior naval officers to discuss the new naval building program. Advocates of the *young school*, including the commander of the Black Sea Fleet, continued to argue against large capital ship

⁵¹ Stalin had read the book within a few months of its appearing in print, even before Orlov had. Rohwer, Monakov, pp. 42.

⁵² Ibid, pp. 42-43.

⁵³ Ibid, p. 62. By contrast, the mightily feared *Bismarck* only displaced 41,000 tons. The only battleships ever built that approximated the super-heavy battleships (75,000-ton design) were the Japanese Yamato-class, which weighed in at 72,800 tons, by far the largest battleships ever constructed.

⁵⁴ Aselius, p. 123.

⁵⁵ In 1937, the following tasks were assigned to the Baltic Fleet in the event of war: “1) Secure the area of deployment (capture the islands in the Gulf of Finland) and defend the approaches to Leningrad); 2) Support the Red Army’s Operations against Finland, Estonia and Latvia; 3) Expand the Fleet’s base areas westwards towards the mouth of the Gulf. 4) Operate against enemy communications in the Baltic; 5) Prevent the enemy from taking up positions along the coasts by attacking his naval forces and bases.” Aselius, p. 177.

⁵⁶ Rohwer, Monakov, pp. 63-64. This was the ten year building list; these ships would have been scheduled for commissioning by 1947.

construction.⁵⁷ But when Stalin personally interjected, it was clear that the debate was over.

The debate's conclusion was made even more final in May 1937, with the initiation of the Great Purges. Claiming that "the assumption of Soviet industrial ineffectiveness which was clearly inherent in the views of the 'new school' was, at least by implication, a criticism of Stalin himself," the NKVD began a vicious purge of Soviet Naval leadership.⁵⁸ Even those officers who had changed course to accommodate Stalin suffered. Still more so than the Red Army, the Red Navy was decapitated: Muklevich, three of four fleet commanders, the commandants of the Soviet naval academies, and countless other officers were shot or deported to camps in 1937 and 1938.⁵⁹ In February 1938, it was announced that the 1938 and 1939 Naval building plans would include "two 35,000 ton battleships, the Red Navy's first aircraft carrier, eight or nine cruisers, about 30 destroyers, and at least 65 submarines."⁶⁰ These plans became even more elaborate over the next few years: in 1940, Stalin sent feelers out to British firms regarding technical assistance for the construction of a 59,150 ton battleship, a vessel 30 percent greater in displacement than the enormous *Bismarck*, then under construction.⁶¹ Even without the construction of such a monstrosity, by 1940, it was estimated that the "Soviet

⁵⁷ Rohwer, Monakov, p. 64.

⁵⁸ Mitchell, p. 373.

⁵⁹ Ibid. Like with the rest of the military purges, there was no rhyme or reason to who survived and who disappeared. The long suffering Muklevich had supported the "big ship" doctrine long before Stalin adopted it. And some of the purge survivors were former Tsarist naval officers who opposed the Mahanian battleship doctrine.

⁶⁰ Mitchell, p. 374.

⁶¹ Ibid, p. 373-374. This proposal was for the *Sovietskiy Soyuz* Class Battleship. Tobias Philbin, *The Lure of Neptune: German-Soviet Naval Collaboration and Ambitions, 1919-1941* (Columbia, SC: University of South Carolina Press, 1994), p. 34.

battleship program alone absorbed 33 percent of the entire Soviet national budget” for defense.⁶² Such colossal expenditures were largely wasted: construction expertise and material shortages made the battleship construction program an unaffordable boondoggle, forcing the reassignment of resources away from unfinished ships later in 1940.⁶³ This last pre-war naval construction program would lead to the most intimate period of Soviet-German naval cooperation. But well before the Molotov-Ribbentrop Pact, the Soviet Navy sought German technical assistance to remedy shortages of trained officers, technicians and shipbuilding expertise. It was the Germans, prior to 1939, who would prove reluctant partners.

THE REICHSMARINE, 1918-1933

On October 24, 1918, Admiral Hipper issued orders to prepare the German High Seas Fleet to weigh anchor. This was in preparation for the so-called “Death Ride,” a full sortie against the much larger British Navy. On the night of October 29, as the German fleet assembled, enlisted sailors on three ships refused orders. The crews of two battleships then arrested their officers and seized control of their vessels. The intervention of reliable crews from nearby torpedo boats led to their arrest and the reassertion of

⁶² Philbin, p. 23.

⁶³ Thanks to the purges, the changes in doctrine and an incomplete naval building program, the Soviet Navy, particularly in the Baltic, was woefully unprepared for war. When combat arrived on June 21, 1941, the Soviet Navy possessed numerical superiority over the Germans. Despite some technical deficiencies, the Soviet fleet boasted four times as many submarines as the German Kriegsmarine. And with the *Kreiser* class, the Soviets possessed one of the world’s best large submarines. But the Red Navy entered 1941 demoralized, badly led and lacking a cogent doctrine that fit its naval capacities. As a result, in the Baltic, the Soviet Navy was “probably weaker in actual fighting value than either the German or the Swedish fleet.” Mitchell, p. 344. And the Soviet fleets in the Baltic and the Black Sea would be devastated in the early days of the war because of the situation on land. Only with the breaking of the Siege of Leningrad would the Baltic Fleet sally forth in numbers to engage their enemies in significant numbers.

control by officers, but it was clear that naval discipline was beginning to deteriorate. On November 1, riots broke out in the port city of Kiel, led by sailors and sympathetic workers. Increasingly radicalized by communist agitators, the sailors demanded the release of the arrested mutineers and an immediate end to the war. Two days later, a naval patrol fired into a crowd of demonstrators, killing seven men and igniting open insurrection. By November 4, councils of sailors and workers took control of Kiel. Within three days, the mutineers, organized by the SPD and communist groups, had seized the reins of power in many of Germany's largest cities, including all of its major port cities. Only with months of fighting would order be restored to the nascent Weimar Republic. The navy entered the Republican era with dubious reputation in the eyes of average Germans; it was seen as responsible for triggering the bloody fighting of 1918 and 1919 which had ended the monarchy and brought the Weimar Republic into being.⁶⁴

Open fighting continued in spurts in Kiel between November 1918 and May 1919, though the sailors' revolutionary councils were brought in line and disbanded by January. Only the presence of right-wing *Freikorps* brigades of officers prevented the total collapse of discipline. Curiously, order was restored in part thanks to the peace negotiators in Paris.⁶⁵ On June 19, 1919, they announced that the German Navy would be reduced to 6 old battleships, six light cruisers, twelve destroyers and twelve torpedo boats.⁶⁶ And the navy would be stripped of all submarines and aircraft. Further, dozens of

⁶⁴ Keith W. Bird, *Erich Raeder, Admiral of the Third Reich* (Annapolis, MD: Naval Institute Press, 2006), p. 39.

⁶⁵ The Revolutionary sailors' councils which had appeared in October, 1918 only lost power with the appointment of Admiral von Trotha and the deployment of the naval infantry brigades in January 1919.

⁶⁶ Bird, *Erich Raeder*, p. 39.

naval officers, including 29 submarine commanders, were to be arrested and extradited to the United Kingdom to stand trial for war crimes.⁶⁷ The officers and enlisted men of the Kiel garrison, who had fought each other or stood apart uneasily since November of the previous year, united to mount a public protest against the terms of the treaty.⁶⁸ On June 21, 1919, at Scapa Flow, Scotland – where the German Navy had been interned – Admiral Ludwig von Reuter ordered his men to scuttle their ships. Fifteen battleships, five cruisers and thirty-two destroyers – the bulk of the German High Seas Fleet – listed and sank over the course of the day.⁶⁹ Future head of the Reichsmarine Admiral Erich Raeder called it “the one inspiring occurrence in that depressing spring of 1919.”⁷⁰ These developments polarized the remainder of the German Navy, emboldening officers and men of the far right.⁷¹

As violence swelled across Germany in the early months of 1919, naval captains Wilfried Loewenfeld and Hermann Ehrhardt, with the approval of Weimar Defense

⁶⁷ Bird, *Weimar, the German Naval Officer Corps and the Rise of National Socialism*, (Amsterdam: B.R. Grüner Publishing Co., 1977), pp. 66

⁶⁸ Bird, *Erich Raeder*, p. 39.

⁶⁹ For more on this, see Dan van der Vat, *The Grand Scuttle: The Sinking of the German Fleet at Scapa Flow in 1919* (Edinburgh: Berlin Limited, 2012).

⁷⁰ Admiral Erich Raeder, *My Life*, translated by Henry W. Drexel (Annapolis, MD: United States Naval Institute, 1960), p. 104.

⁷¹ Bird, *Weimar, the German Naval Officer Corps and the Rise of National Socialism*, pp. 71-83. The political lines that so divided the navy in the aftermath of the First World War were determined part by service record. The enlisted men and petty officers of the German surface fleet by and large favored the left and were the most aggressive supporters of the SPD and KPD. This tendency had been exacerbated by four years spent idly in port, in close proximity to the workers of Germany’s largest port cities. Perhaps not surprisingly, officers throughout the fleet remained committed to the right, largely in its monarchist form. And the enlisted men and officers of the submarine and torpedo squadrons – those branches of the German Navy which had experienced by far the most combat in the First World War – would prove most amenable towards the radical right. While generalizations, German naval officers clearly thought along these lines. For instance, it was the capital and surface ships which first declared against the Kapp Putsch when civil war effectively broke out at the Kiel Naval Base. The torpedo crews, considered “reliable” by their commanders, did not relieve their officers until much later during the failed coup.

Minister Gustav Noske, organized two brigades of naval volunteers to fight the forces of the radical left.⁷² Loewenfeld, who had served on the Western Front with one of the three naval infantry divisions deployed there, helped to supervise infantry training and turned the brigades into effective combat forces.⁷³ After putting down pro-Communist workers and sailors in Kiel during the summer of 1919, the brigades were transferred to Silesia to fight Polish insurgents, then to the Ruhr to put down yet another Communist insurrection. They rapidly became vital troubleshooting units for the government.⁷⁴

At the end of February 1920, Noske ordered the dissolution of the two brigades, in accordance with the terms of the Treaty of Versailles. Ehrhardt refused to disband his men. His commanding officer, Army General von Lüttwitz, decided to organize a coup against Ebert's left-center government. On the evening of March 13, the Ehrhardt brigade marched into Berlin, occupying the city center, and appointed conservative German National People's Party Representative Wolfgang Kapp as Chancellor. Reichswehr troops ordered to disperse Ehrhardt's men refused to fire. Only a general strike involving 12 million workers, which paralyzed Berlin, forced the coup plotters to back down. On March 18, Lüttwitz resigned and was given full pension rights. Kapp was arrested after fleeing the country and extradited, dying in prison. Ehrhardt, obeying orders from Seeckt, marched his men out of Berlin in good order and was not even relieved of his command.⁷⁵

⁷² Bird, *Erich Raeder*, p. 42.

⁷³ Bird, *Weimar, the German Naval Officer Corps and the Rise of National Socialism*, pp. 146-148.

⁷⁴ Carsten, p. 133.

⁷⁵ Bird, *Weimar, the German Naval Officer Corps and the Rise of National Socialism*, pp. 83-84.

On the whole, the coup had been resolved almost without blood. But for the German Navy, it was a disaster. Its two most significant land formations had committed treason against the Republic. Even worse, the head of the Reichsmarine, Admiral Adolf von Trotha, had enthusiastically and publicly backed the Kopp coup attempt on its first day.⁷⁶ Unlike Seeckt, who had played an ambivalent role and backed the government when the tide turned against Kopp, Trotha did not extricate himself until the coup had collapsed. Even worse, enlisted men in the Kiel garrison had taken up arms against the coup, leading to yet another round of intra-navy bloodletting.⁷⁷ Trotha was immediately relieved, replaced temporarily by Admiral Wilhelm Michaelis, then permanently by Paul Behnke.⁷⁸

The twin disasters of 1918 and 1920 would define the interwar German Navy. The Reichsmarine's leaders – Paul Behnke (1920-1924) and Hans Zenker (1924-1928) – were, by and large, passive leaders who gave their subordinates little direction.⁷⁹ From 1920 on, the navy was seen by the government and by the German public as a source of political instability from both right and left. Coupled with the navy's largely inactive role in the First World War, naval officers feared that the entire service might be disbanded as a result, just as a similar fear would roil the Soviet military after the Kronstadt Mutiny.

Behnke, who took over as Head of the Navy Department on August 31, 1920, saw his primary mission in political terms.⁸⁰ It was to convince the government of the

⁷⁶ Bird, *Erich Raeder*, p. 43.

⁷⁷ *Ibid.*, p. 44.

⁷⁸ *Ibid.*, p. 48.

⁷⁹ Bird, *Weimar, the German Naval Officer Corps and the Rise of National Socialism*, p. 205.

⁸⁰ Bird, *Erich Raeder*, p. 48.

absolute loyalty of the navy, as well as the general public of the need for a navy. During a general reorganization of the navy in 1921, officers were transferred or retired based on their perceived political sympathies.⁸¹ The most important of these was the departure of Erich Raeder, future *Grossadmiral*, who was sent to languish in the Naval Archives for his support for the Kapp Putsch.

Raeder's was a symbolic punishment more than anything else, as, throughout his term, Behnke's subordinates continued to promote right-wing officers and supervise the admission of right-wing volunteers. Given that 30-40,000 men volunteered per year to join the German Navy, and that its tiny size allowed only a thousand or so to join per annum, Behnke's staff was able to select only politically reliable officers.⁸² Almost all of the cadets admitted to the naval academy at Mürwick in the early 1920s were former members of the two naval infantry brigades: "some openly admitted that they only intended to remain in the navy... [until] Erhardt called them again."⁸³ And in a display of irony, new officers in 1921 would take their oath to the Weimar constitution in front of a giant portrait of Wilhelm II.⁸⁴ The effect was clear: a dramatic shift towards the far right of the political spectrum. By 1926, several naval units had added swastikas to their uniforms, and at least one vessel had the German eagle clutching the swastika on its

⁸¹ Rolf Güth, *Die Marine des Deutschen Reiches, 1919-1939 [The Navy of the German Reich]* (Frankfurt am Main: Bernard und Graefe, 1972), pp. 51-60.

⁸² Bird, *Erich Raeder*, p. 61.

⁸³ Carsten, p. 133.

⁸⁴ *Ibid*, p. 133.

stern.⁸⁵ Just as in the Reichswehr, the Treaty of Versailles' limitations allowed a small group of officers to dictate the political orientation of their organizations.⁸⁶

Meanwhile, in the Naval Archives, Erich Raeder was hard at work supervising the creation of the Navy's post-war review. It was not nearly as thorough as the brilliant Reichswehr studies of Germany's land war, but served an important role in the reformation of the German naval branch.⁸⁷ His conclusions were that Tirpitz' focus on Mahanian decisive battle, and on battleships, was wrong. Instead, he emphasized instead the writings of Julian Corbett, who emphasized the importance of commerce raiding and striking at enemy lanes of communication. Raeder's own experience in Germany's *Kreuzer* force during the war convinced him that surface raiders would prove more valuable than battleships in a future war.⁸⁸

A complicated man, Raeder was the central figure of the Reichsmarine from 1928 to 1942, to the extent that one historian argued that "the navy became Raeder, and Raeder, the navy."⁸⁹ As its leader, he was a political chameleon. From political exile, Raeder pitched himself as a good Republican, eventually receiving the appointment as head of the Reichsmarine in 1928; in the 1930s, he would appear an equally dedicated Nazi.⁹⁰ Yet in reality, Raeder was neither, but rather a traditional monarchist and strict

⁸⁵ Carsten, pp. 78-91.

⁸⁶ Philbin, p. 10.

⁸⁷ As V.E. Tarrant wrote, "the vanquished had obviously learnt the lessons of the first war far better than the complacent victors, for the tactical combination of wolf-packs, night surface attacks and an aggressive unrestricted strategy would wreak havoc with British defenses." (V.E. Tarrant, *The U-Boat Offensive, 1914-1945* (London: Arms and Armour Press, 1989, p. 80)

⁸⁸ In addition, his experiences seem to have prejudiced Raeder against the submarine arm. Despite clearly playing the central role in Germany's naval efforts from 1914-1918, it took a secondary role in Raeder's 1922 work to surface ships. Bird, *Erich Raeder*, pp. 50-52.

⁸⁹ Bird, *Weimar, the German Naval Officer Corps and the Rise of National Socialism*, p. 205.

⁹⁰ *Ibid*, pp. 205-218.

Lutheran.⁹¹ He would impose his personal ethos on the Reichsmarine: in 1931, he expelled a young naval officer named Reinhardt Heydrich from the service for an extra-marital affair.⁹² Important for the purposes of this study, Raeder was a Russophile. He was fluent in Russian, served as naval observer during the Russo-Japanese War and had even translated a medieval Russian manuscript into German.⁹³ At the same time, however, he had personally suffered for his role in the political upheavals of 1920, and was utterly ruthless in suppressing communism within the ranks of the navy. Working in proximity to the Soviet navy threatened to unravel that unity, and Raeder, despite his personal history, would largely oppose working with the Soviets.

THE NAVY'S STRUGGLE AGAINST VERSAILLES

Before Raeder's arrival in 1928, the German Navy, unlike the rest of the German military, was able to indulge in some technical development at home. Cruiser development, "less handcuffed by the Treaty of Versailles," proceeded almost as soon as the war ended: in 1921, the German Navy laid down the keel for the new cruiser *Emden*.⁹⁴ Light cruiser construction, replacing the old vessels allowed after the peace, continued throughout the 1920s. New torpedo boat construction began in 1926.

The German Reichsmarine, like the Reichswehr, used a number of deceptions to evade Versailles. Outside of Germany, the navy would establish a considerable network

⁹¹ These beliefs did not keep him from being complicit in the rise of the Nazis, or from becoming deeply implicated in Nazi war guilt.

⁹² Heydrich would return the favor and see Raeder hounded out of his office in 1942.

⁹³ Raeder, pp. 26-27.

⁹⁴ *Ibid*, p. 146.

of factories, design bureaus and shipyards to continue illegal rearmament research and development. In particular, the Reichsmarine maintained a covert submarine program that involved work in Spain, Finland, Sweden and Turkey. Within Germany, it created civilian organizations to avoid the 15,000-man limit on personnel; it hid weapons, particularly coastal guns; and it sold prohibited naval equipment to raise funds for other illicit work.⁹⁵ Between domestic programs and secret developments abroad, the German Navy did not fall significantly behind the West in technical terms.

But the desire of the Reichsmarine for a renewed *Weltflotte* required new battleship and submarine construction. The German submarine program was conducted outside of Germany until 1935. Its capital ship program would resume within Germany in 1928. As early as 1925, naval officers began discussing specifications for a *Panzerschiff* (armored vessel) with industrial firms in the Ruhr. However, it was not until 1928, with the election of a large contingent of conservative (and NSDAP) representatives to the Reichstag, the navy publicly unveiled its plans. With the backing of Nazi deputies, plans for three 10,000-ton “pocket battleships” passed; the first keel would be laid down in early 1929.⁹⁶ These *Panzerschiffe* neatly fitted with the new head of the Reichsmarine Admiral Erich Raeder’s concepts of naval warfare.⁹⁷ His ascension, coupled with the changing political environment, signaled the beginning of open and aggressive rearmament by the Germany Navy.

⁹⁵ Barton Whaley, *Covert German Rearmament, 1919-1939: Deception and Misperception* (Frederick, MD: University Publications of America, INC, 1984), p. 26-27.

⁹⁶ *Ibid.*

⁹⁷ Raeder, p. 136. In fact, he had assumed command of the admiralty on 1 October, 1928.

Despite political and military challenges, the Reichsmarine possessed a number of advantages that the German Army did not. The French and British were far less concerned with the German Navy than they were with Germany's land forces. In fact, close prewar ties between the British and German navies manifested themselves during the inspections of the Inter-Allied Control Commission, where the Germans felt that the British commissioners were more or less on their side. British commissioner Fonshow had parted from his German counterpart with the words: "Not one word you uttered was true, but you delivered your information in such a clever way that we were in a position to believe you. I want to thank you for this."⁹⁸ Statements like these and the generally lackadaisical attitude of British Inter-Allied Military Control Commissioners (IAMCC) made it clear that in the aftermath of Scapa Flow, the British were not particularly concerned with German naval disarmament. Further, the Washington Naval Treaty, signed February 6, 1922, limited the military shipbuilding of all the major powers.⁹⁹ The lack of an arms race in the 1920s and 1930s made it far easier for the Germans to "catch up" with the Allied powers when the Reichsmarine initiated its new building program. In addition, with far smaller financial commitments to ship maintenance and construction, the Reichsmarine was able to devote resources instead towards maintaining technical parity in many crucial areas, including torpedoes, mines, submarines and sonar.

⁹⁸ Captain Schuessler, "The Fight of the Navy against Versailles," *The High Command of the German Navy, 1937*, NARA II, RG 238, R3-6, p. 13.

⁹⁹ Peter Doepgen, *Die Washingtoner Konferenz, das Deutsche Reich und die Reichsmarine: Deutsche Marinepolitik 1921 bis 1935* (Bremen: Verlag H.M. Hauschild GmbH, 2001), p. 45. As Doepgen points out, the treaty was an absolute godsend to both the German and Soviet navies. Neither were signatories, and so not bound by any of the treaty's terms. In addition, the limitations on shipbuilding provided a "breather" for both navies. The German Navy would only begin a major building program in 1932, and the Soviets in 1933. Doepgen, pp. 96-97.

But the most important work on maintaining naval power was done outside of Germany. The brain behind much of Germany's secret naval rearmament was Wilhelm Canaris. In 1920, Canaris, a naval intelligence officer during the First World War, was appointed as executive officer on board the cruiser *Berlin*. In that position, he began to arrange secret rearmament contracts overseas in conjunction with groups of officers who made up "the ultraconservative navy fronts for political conspiracies and secret rearmament."¹⁰⁰ While Canaris initiated work on behalf of the Reichsmarine in Spain and the Netherlands, the day-to-day management of most of the covert programs was put in the hands of another man, Captain Walther Lohmann.

Born the son of the former president of *Norddeutscher Lloyd* shipping company, he was a largely unknown logistics officer when the war ended.¹⁰¹ After playing an important role in the Versailles decommissioning negotiations, he showed considerable skill in purchasing back large numbers of German commercial vessels from British custody. He also adeptly managed to get German naval POWs released from custody and supervised their return.¹⁰² His skills in this regard earned him great praise from his senior officers, and in October 1920, he was promoted to head the Naval Transport Section of the Reichsmarine.¹⁰³

¹⁰⁰ Doepgen, p. 27.

¹⁰¹ Schuessler, p. 24.

¹⁰² Ibid.

¹⁰³ "The Lohmann Affair," CIA Historical Review Program, September 9, 1993, https://www.cia.gov/library/center-for-the-study-of-intelligence/kent-csi/vol4no2/html/v04i2a08p_0001.htm

In that position he was twice sent to Leningrad to negotiate for the release of interned German vessels.¹⁰⁴ He visited first in late 1921, then returned with a large delegation to conclude an arrangement with Admiral Zof, from May 27 to June 19, 1922.¹⁰⁵ During his two trips, Lohmann became closely acquainted with an attractive young Russian woman of German descent named Else Ektimov, whom he brought back with him to Germany; she soon became entangled in his professional life.¹⁰⁶ Lohmann's success in the negotiations with Russia led to his further promotion – he was given total control over the Reichsmarine's "black funds." These were large sums that had been retained by the German army and navy through the sale of materiel banned by the Allies. Thanks to the terms of the Treaty of Versailles, the German Navy had amassed more than 25 million dollars' worth of hard currency through the sales of military vessels.¹⁰⁷ Behnke gave Lohmann total control over these funds to improve the navy's capacity for a future war.¹⁰⁸ This meant avoiding the Treaty of Versailles.

Initially, Lohmann used his funds to discreetly return dozens of vessels impounded during the war, restoring the German merchant marine fleet as cheaply as possible.¹⁰⁹ He then began to buy shares in German shipyards and naval facilities, where he spent black funds to retain skilled personnel and construct vessels, ostensibly for

¹⁰⁴ Zeidler, p. 61.

¹⁰⁵ Gorlov, p. 137;

"Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff," p. 7.

¹⁰⁶ "The Lohmann Affair" CIA Historical Review Program; "Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff," p. 13. German naval documents claimed that their relationship was purely platonic, as Lohmann was married; given some of the details of their relationship, this seems unlikely.

¹⁰⁷ "The Lohmann Affair," CIA Historical Review Program.

¹⁰⁸ Ibid.

¹⁰⁹ Schuessler, p. 25

civilian purposes, but really for future military use. The Reichsmarine, through Lohmann's intervention, also arranged to have banned weapons stockpiled at German corporate facilities outside of Germany. The Netherlands was a favorite destination for large quantities of aircraft, munitions, guns and optical equipment which were stored at warehouses at safe industrial sites.¹¹⁰ Through his growing business connections, Lohmann also purchased an aircraft manufacturing company (Casper) and a small airline (Severa) to expand the navy's aviation wing and train new pilots.

Lohmann's superiors were very impressed by his early work and his discretion: unlike the army, the Navy did not have to deal with public scandals between 1924 and 1926. The enigmatic Canaris can be partially credited for this success. In any case, Lohmann soon went too deep. Most of his early business ventures had clear naval applications. Sometime in 1926, with his funds depleted, Lohmann decided he would start to buy firms he thought could also turn a profit, thus replenishing the black funds. He invested heavily in some bizarre research projects, including attempts to make gasoline from potatoes. He poured millions of marks into the Berlin Bacon Company, a firm that exported German pork to Great Britain.¹¹¹ And perhaps most disastrously, he bought shares in a movie studio, Phoebus Films, Germany's third largest film

¹¹⁰ Schuessler, pp. 10-13.

¹¹¹ Schuessler, p. 35. As to why he decided to get involved in the bacon exporting business, Captain Schuessler wrote that "Lohmann followed the influence of advisers, who believed to be able to gain big financial successes if the products would be used for military purposes. L[ohmann] also believed that the mass transportation of bacon to England, as Denmark carried it out at that time, could also be carried out by Germany and the consequence thereof would be the building of fast transportation ships; the increase of the merchant navy which would be the result would be of great importance in the case of war. Furthermore, L[ohmann] considered it as possible, to acquire condants in the local representatives of the company abroad, a fact which would be important for the organization of supply to Germany from the neutral foreign countries." It is a little difficult to envision the "military uses" of bacon which Lohmann had in mind. At best, it was a poor investment.

producer.¹¹² Lohmann had some reasonable reasons for investing initially. First, he (again, probably influenced by Canaris) planned to establish a network of subsidiary studios throughout the world. By hiring actors and employees who could also serve as German spies, he hoped to create a vast intelligence network.¹¹³ Interestingly, Phoebus Films' first international outreach was to the Soviet Union. In addition, Lohmann planned to have the studio produce nationalistic films that portrayed the military in a good light. And lastly, he found his young Russian "friend," Else Ektimov, a job at the studio, which apparently involved little work and a good deal of money.¹¹⁴

Phoebus Films was in poor financial straits at the time, and Lohmann's huge injection of funds did little to slow the company's decline. By 1927, it was bankrupt, as was Lohmann. A former disgruntled company director told a journalist from the *Berliner Tageblatt* all about the Reichsmarine's role in the company, and the story soon became a national sensation. Thankfully for the German military, the revelations mostly centered on Lohmann's ill-fated bacon and film ventures.¹¹⁵ Hearings in the Reichstag avoided the broader discussions of the illegal submarine program. In the end, Lohmann suffered little for his efforts: he was subjected to an early retirement and a slightly lower pension.¹¹⁶

¹¹² Schuessler, pp. 30-31.

¹¹³ Ibid, pp. 30-31.

¹¹⁴ "The Lohmann Affair," CIA Historical Review Program.

¹¹⁵ Ibid.

¹¹⁶ He would die of a heart attack in 1930.

THE GERMAN SUBMARINE PROGRAM, 1922 TO 1935

While Lohmann's covert work attracted worldwide headlines when it was revealed in 1927, the German Navy's most successful covert program remained hidden. In 1922, Admiral Behnke assisted in the foundation of the *Ingenieurskantoor voor Scheepsbouw* [Engineering Office for Shipbuilding, or *IvS*] in the Netherlands. *IvS*, secretly owned by Germany's three largest naval shipyard firms (Vulkan AG, Krupp's Germaniawerft subsidiary and Weser AG), served as the central repository of German technical knowledge and skill: "the purpose of this foundation [*IvS*] was to keep together an efficient German submarine construction office and by practical work...keep it in continuous practice and on top of technical development."¹¹⁷ The three German firms rotated vital staff (about 30 at any one time) through their *IvS* office to gain experience on submarine construction. In addition, *IvS* invested in the Crichton-Vulkan Shipyard in Turku, Finland and the Echevarrieta Shipyards in Cadiz, Spain.¹¹⁸

The first major order came in 1925. Through the work of a retired captain named Blum who was advising the Turkish government, the Turkish navy ordered two 500 ton submarines from *IvS*. Lohmann's black funds made the order possible by subsidizing construction by nearly a million reichsmarks.¹¹⁹ The next year, another retired submarine captain, Karl Bartenbach, working as a consultant in Finland, convinced that government to allow the Germans to build four submarines at Turku.¹²⁰ Three five hundred ton and one one hundred ton submarines were completed by the Germans there. Simultaneously,

¹¹⁷ Schuessler, p. 39.

¹¹⁸ *Ibid*, pp. 38-39

¹¹⁹ *Ibid*, p. 39.

¹²⁰ *Ibid*, p. 40.

the Finnish government allowed the Germans to build and test their own prototype, codenamed the “Liliput,” or “CV-707.” Finally, with the assistance of Captain Canaris of Naval Intelligence, IvS also contracted with the Echevarrieta shipyards in Spain to build a new prototype, a 750-ton U-boat codenamed the *E-1*. The Reichsmarine took full advantage of these construction projects in both Finland and in Spain. To gain experience, German crews would take the submarines out for “testing”:

The submarine made her test run and submerging test in 1931 from Cadiz and Cartagena.... The tests were carried out under the supervision of Kapt.lt. Braeutigam (retired), Marine Staff Engineer Papenberg (retired), later relieved by K.Kapt. (Engineer) Hulsmann (retired) and the Marine Engineers Schotte and Hey. The personnel were composed mainly of German officers, engineers and shipweight students and masters, who were for the first time on a submarine.¹²¹

Thus, the Reichsmarine was able to maintain a core of talented naval officers, most of whom would be recalled to service in the 1930s. Further, a new generation of naval engineers and junior officers gained vital experience through the secret construction and testing of the new *U-Boats*.

In technical terms, these submarines were vital links between the boats of World War I and World War II. The “Liliput” was a 250-ton submarine built in the Finnish naval yards under IvS supervision. Its small size meant that it could not engage in long-distance commerce raiding, but it was an ideal platform for testing new technologies and training new crews. For instance, the “Liliput” had a dive capability twice as great as any German submarine of World War I. Two months before Hitler officially abrogated the Treaty of Versailles, the workers at the DeutscheWerk Shipyards in Kiel began building

¹²¹ Schuessler, p. 40.

the U-1, Germany's first submarine since 1918. It was nearly identical to the "Liliput" in design, as were its nine sister ships of the Type II class. Fifty Type II submarines would be built by 1940.¹²²

The 750-ton submarine *E-1* – built in Spain in 1931 and tested that same year – served as the prototype for the U-25 and U-26 of the Type I *class*.¹²³ In 1933, "the individual parts of the flag submarines U-25 and U-26 too were prepared in secret for assembly before the order for assembly was given."¹²⁴ Although the two Type I prototypes proved to have minor handling flaws, they served as the basis for the similar Type VII (703 built) and Type IX (283 built). These two latter submarines constituted the bulk of the German submarine force in World War II.¹²⁵ The Reichsmarine (renamed the more belligerent-sounding Kriegsmarine in 1935), operated under the impression that changing political conditions would allow their assembly; they optimistically ordered the components for twelve submarines in 1933.¹²⁶ On June 18, 1935, the British government agreed to the Anglo-German Naval Treaty, which effectively legalized the covert rearmament already begun in German shipyards with Hitler's blessing.¹²⁷ So ready was

¹²² Tarrant, p. 78; pp. 174-175.

¹²³ It was called the E-1 while in Spain, but known as the *Gür* after its transfer to the Turkish navy. Schuessler, p. 41.

¹²⁴ Schuessler, pp. 43.

¹²⁵ Tarrant, pp. 175-176. See also Whaley, pp. 28-29.

¹²⁶ *Ibid*, p. 78.

¹²⁷ There are a number of analyses of the Treaty and why Great Britain so quickly endorsed Nazi German rearmament. Some have argued that this was the beginnings of appeasement; others that it was better to impose some measure of control on the Germans rather than none at all; some that the British navy was complacent on the issue of German naval rearmament because of their victory in World War One; and others that the British ruling class sympathized with Germany on the issue of naval rearmament. In any case, both the 1935 and 1937 agreements were disasters for British strategy and naval power. By August 1938, the Kriegsmarine had under construction or in active service the same amount of submarine tonnage as the British navy. Tarrant, p. 79. For more, see Hines H. Hall III, "The Foreign Policy-Making Process in Britain, 1934-1935, and the Origins of the Anglo-German Naval Agreement," *The Historical Journal* (Cambridge, UK), Vol. 19, No. 2 (Jun., 1976), pp. 477-499 and Thomas Hoerber, "Psychology and

the Kriegsmarine for the change in status that the first submarine was launched only eleven days after the Treaty was signed.¹²⁸ Within a matter of months, Germany had all twelve submarines in commission.¹²⁹

IvS also conducted other, supplementary developments overseas from 1922 onwards. The last wartime leader of the Imperial German Navy's "Torpedo Experimental Station," Captain Hirib, travelled to Spain, where he supervised the construction of a torpedo that "leaves no wash" and thus did not give away the location of a U-Boat when it fired.¹³⁰ This torpedo was test-fired for the first time on board the *E-1* during one of its covert trips out of Cadiz. At the same time, German engineers were at work in Sweden, working on a new electrical torpedo that "leaves no trace of bubbles" as it moves through the water – eliminating warning for a potential victim.¹³¹ These tests led to the construction of the "E Class" torpedo at an assembly plant in Spain owned by the Echevarrieta firm, although the actual work was done by employees of Siemens AG.¹³² In 1932, the German firm Pintsch built three of these prototypes and shipped them secretly to Finland, where the "Liliput" test-fired them for the first time.

Altogether, Germany's secret submarine program, conducted on a vast scale in five countries, produced six submarines, including two vital prototypes. It had led to new torpedoes, batteries and other vital equipment. The Kriegsmarine emerged from the

Reasoning in the Anglo-German Naval Agreement, 1935-1939," *The Historical Journal* (Cambridge, UK), Vol. 52, No. 1 (2009), pp. 153–174.

¹²⁸ Tarrant, pp. 78-9.

¹²⁹ Schuessler, pp. 43-44.

¹³⁰ *Ibid.*, p. 43.

¹³¹ *Ibid.*, p. 44.

¹³² *Ibid.*, p. 45.

strictures of Versailles in 1935 ahead of every other navy in the world in submarine technology. By 1937, “during the critical moment of the occupation of the demilitarized zone on the Western Border” the Kriegsmarine had seventeen submarines ready for combat and capable of striking at France’s sea-lanes.¹³³ This came only two years after Germany’s official abrogation of the Treaty of Versailles. The Kriegsmarine also possessed experienced workers, engineers, sailors and officers to fill the ranks of its U-Boat arm. Appropriately, “retired” Captain Karl Bartenbach, who had supervised the secret submarine activities in Finland, was recalled to active duty and placed in command of Germany’s reborn submarine arm.¹³⁴

THE FAILURE OF SOVIET-GERMAN NAVAL COOPERATION, 1918 TO 1929

The success of covert German naval rearmament in Spain, Finland, Turkey and Sweden dictated the course of Soviet-German Naval Cooperation. Unlike the German Army, which saw the Soviets as an ally in any future war, the German Navy saw the Soviet fleet in the Baltic as one of its primary adversaries. From 1918 to 1933, the German Navy resisted efforts at cooperation proposed both by the Soviet Navy and the German Army. Despite that, relations between the German and Soviet Navies affected both in the interwar period, particularly the latter. And in 1939, a brief and intense phase of cooperation would be born from the Molotov-Ribbentrop Pact.

¹³³ Schuessler, p. 38.

¹³⁴ Ibid, p. 48.

The first direct contact between the two naval forces occurred even before the war in the west had ended. The Tsarist Navy interned 87 commercial vessels in 1914.¹³⁵ When German forces forced Lenin and the Bolsheviks to sue for peace at Brest-Litovsk, the fate of these vessels was a major sticking point. Article 12 of the Treaty of Brest-Litovsk referenced these ships, stating that “the question regarding merchant ships which have been seized....will be provided for in separate treaties with Russia, which form an important part of the present treaty, and as far as it is possible come into force simultaneously with the latter.”¹³⁶ Less than two months after the official signing of Brest-Litovsk, the first ships began to return to German possession, beginning with the *Asgard* in April 1918.¹³⁷ However, the transfer of ships, which accelerated over the summer of 1918, slowed during the fall of 1918 and halted altogether in January 1919, leaving 45 German commercial vessels in Russian hands.¹³⁸ German military defeat rendered the Treaty of Brest-Litovsk meaningless.

It was not until the fall of 1921 that new negotiations began between the two states regarding the transfer of the remaining ships back to Germany. The two sides reached an agreement on December 10, 1921 for the repatriation of the ships which were still seaworthy.¹³⁹ Major Fischer and representatives of the *Reichsmarine* appear to have

¹³⁵ “Embargoschiffe in Russland,” 22 July, 1922, R 31550, 000022-000026, Politisches-Archiv, Auswärtiges-Amt, pp. 1-4.

¹³⁶ “Treaty of Brest-Litovsk,” *Avalon Law Project*, Yale University Law School, http://avalon.law.yale.edu/20th_century/bl34.asp

¹³⁷ “Embargoschiffe in Russland,” p. 2.

¹³⁸ *Ibid.*, pp. 1-5.

¹³⁹ *Ibid.*

played a critical role in this process, which was an essential step towards the normalization of relations which occurred five months later at Rapallo.

Other than Lohmann's trips to repatriate German vessels, no direct links between the two navies were forthcoming for the next five years. However, German businesses did conduct some work in the Soviet Union related to naval matters. The Petrograd Naval Yards, badly damaged during the revolution, were reorganized into "Sudotrust" in 1924. Among those hired to assist in the reorganization and rebuilding of the damaged yards was the Krupp Corporation, which sent technical experts to estimate the costs of repair and necessary equipment to render the facilities productive again. Beginning in 1925, the yards again began laying down ship hulls. Three of the vessels completed by 1930 were constructed with German technical assistance.¹⁴⁰

The first direct contact between the two navies occurred in 1926.¹⁴¹ As noted earlier, in March 1926, the Assistant Commissar of the RKKA, Josef Unschlikht, visited Berlin to press for military cooperation between the two states. In a meeting with Seeckt, naval cooperation was mentioned. Neither Seeckt nor Unschlikht were particularly conversant on naval policy, so they agreed to have representatives of the two navies meet separately.¹⁴² On March 25, 1926, former Soviet military attaché to Germany Luniev and

¹⁴⁰ Antony C. Sutton, *Western Technology and Soviet Economic Development, 1917 to 1930* (Stanford, CA: Stanford University Press, 1968), p. 254.

¹⁴¹ Admiral Behncke, shortly after leaving his office as head of the Reichsmarine, traveled to Moscow on his way to the Far East, and did have dinner with Commissar for Foreign Affairs Chicherin while there. But the two men only talked in generalities on that occasion. Carsten describes this visit as having been conducted in 1926, and immediately followed by Unschlikht's visit to Berlin, but that appears not to be the case. Rohwer, Monakov, p. 32.

¹⁴² Philbin, p. 12.

navy representative Oras arrived in Berlin.¹⁴³ They were met by six German representatives, led by Admiral Arno Spindler, Germany's top submarine expert.¹⁴⁴

The Soviet representatives began by attempting to reassure their German counterparts. They made it clear that they were seeking "German cooperation in the reorganization of their Navy" but were not seeking any assistance for the Baltic fleet, where "for the time being no shipbuilding is planned....because of the danger from neighbouring countries."¹⁴⁵ Such reassurance could only be designed to make it clear a resurgent Soviet navy would not be a threat to Germany. The Soviet representatives then laid out a detailed list of requests: they "desired German participation in the Soviet Scientific-Technical Committee of the Naval Administration and participation by German officers on temporary duty at their Naval War College, either as instructors or to work on projects of certain mutual interest with the Soviets."¹⁴⁶

In exchange, the Red Navy wanted to be able to send their own officers to Germany "to learn about gunnery, torpedoes, mines and shipbuilding," as well as establishing partnerships with Germany's most important shipbuilding firms, such as the Deutsche Werke Shipyards in Kiel.¹⁴⁷ They also sought the construction of German submarines in Soviet shipyards, something the Germans immediately declined "as this is

¹⁴³ "Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff," 1947, *Office of Naval Intelligence*, Naval Historical Collection, Naval War College (NHC-NWC), Newport, Rhode Island, p. 7. This report is compilation of primary sources taken out of Germany at the end of World War II.

¹⁴⁴ *Ibid.*, p. 7.

¹⁴⁵ "Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff," p. 7. This was a lie, as the only major Soviet shipbuilding ongoing in 1926 was the construction of three new "dekabrist" class submarines and a number of escort and patrol vessels in the Leningrad shipyards. Rohwer, Monakov, p. 24.

¹⁴⁶ Philbin, p. 13.

¹⁴⁷ *Ibid.*, p. 13.

ruled out by the Versailles Treaty.”¹⁴⁸ This was, of course, disingenuous, given ongoing German efforts in Spain, Turkey, the Netherlands and Finland, as the Soviets were aware.¹⁴⁹ But a basis for exchange seemed possible. To negotiate terms, the Soviets invited Spindler to travel to the Soviet Union, an offer the *Reichsmarine* accepted. In exchange, Soviet representatives were granted permission to visit the German Navy’s secret naval construction bureau in the Netherlands, IvS, which they did in April 1926.¹⁵⁰ Even more encouraging for Soviet representatives, the Reichsmarine gave a Soviet naval official a detailed tour of Germany’s newest vessel, the cruiser *Emden*. It appeared naval cooperation might follow the same path as the German land and air forces.

On June 2, 1926, Spindler arrived in St. Petersburg as a guest of Unschlikt and the head of the Soviet Navy, Admiral Zof.¹⁵¹ The German delegation spent three days in conferences with Unschlikt and Zof in Moscow, during which time Spindler noted that Zof “displayed mistrust and a lack of good manners,” “made suspicious remarks,” and wrote that “it is especially necessary to be careful with him.” Unschlikt, on the other hand, made a very favorable impression: Spindler described him as “friendly,” amiable and “businesslike.”¹⁵² Spindler believed that he had found a man with whom the German

¹⁴⁸ “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 12.

¹⁴⁹ “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 12. The Germans revealed the existence of the I.v.S. facility in March and allowed Soviet officers to tour the shipyard in April. As to the other illicit activity, at least one Soviet officer made it clear that the Red Navy was well aware of German naval activity in foreign lands: “he [Naval Officer “Sov” [sic] made some suspicious remarks about the activities of German naval officers in Turkey and on I.v.S. construction plans...”

¹⁵⁰ Philbin, p. 14.

¹⁵¹ Erickson, p. 250.

¹⁵² “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” pp. 11-14

Navy could work. He concluded that “Unschlicht is obviously the competent man to deal with in all matters concerning the cooperation of the two navies.”¹⁵³

After three days of conferences in Moscow, the delegation traveled to St. Petersburg, where they were given tours of Kronstadt and naval installations in the area, as well as three ships. On June 8, the Soviets rejected Spindler’s requests to visit a Soviet battleship and submarine with the excuse that the ships “are not at Kronstadt at the moment.”¹⁵⁴ Unschlikht subtly hinted that the real reason was the decrepit state of the Soviet Baltic Fleet.¹⁵⁵ The Spindler trip did end with some specific results. The Soviets requested access to Turkish and German submarine designs, details about German naval construction in Turkey, advice on submarine construction and assistance in reaching accommodations with German shipbuilding firms which had expertise in submarine construction.¹⁵⁶ In exchange, the Germans requested “the Soviet naval budget for 1926 and an organizational chart of the Russian navy.”¹⁵⁷ Spindler concluded his report by saying “if we want to grasp the hand that is so obviously offered, there is, in my opinion, a possibility of gaining a great deal in certain fields in the long run.”¹⁵⁸ Of the eight

¹⁵³ “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 13. An interesting note is that Zof rapidly fell from grace after these meetings. This was in large part because of his continued fight for the independence and expansion of the Navy. He had served in the Red Navy since the Civil War and commanded it since 1921, but later in 1926 he was reassigned to head the tiny Soviet commercial fleet, a major demotion. His downward trajectory continued, next with a position in the railways, then as a deputy minister for water transportation, then as manager of a factory in Moscow, before being arrested and shot in 1937.

¹⁵⁴ “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 13.

¹⁵⁵ Ibid, p. 13.

¹⁵⁶ Ibid, p. 14.

¹⁵⁷ Philbin, p. 15.

¹⁵⁸ “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 15.

official Soviet proposals, Spindler recommended immediate acceptance of five, rejection of one and later reconsideration of two more.

On July 1, senior Reichsmarine officers organized a conference to discuss Spindler's report. Most of the officers present voiced strong disagreement on the possibility of working with the Soviets. This came in a number of forms. Lt. Commander Canaris, already head of Reichsmarine Intelligence, worried that the Soviets would sell the plans to their enemies. Another officer noted that French intelligence was likely to find out about any meetings with the Soviet military attaché in Berlin, and that Germany could suffer serious consequences for violating the Treaty of Versailles as a result.¹⁵⁹ He also noted that working with the Soviets "would cause much annoyance with Finland," who were providing more assistance to German naval rearmament than the Soviets.

But the final decision rested with Admiral Hans Zenker, head of the *Marineleitung* (Naval Command) from 1924 to 1928. Zenker quietly spent his term in office laying the groundwork for the rebuilding of the German fleet. It was during his term in office that extensive submarine construction would begin overseas, and the plans for Germany's pocket battleships would be made. Zenker took twelve days to deliberate on Spindler's report before ordering the dispatch of submarine blueprints to the Soviet Navy.¹⁶⁰ However, these plans only included blueprints of vessels designed in the First World War which had already been surrendered to the Allies under the terms of the

¹⁵⁹ "Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff," p. 16.

¹⁶⁰ Ibid.

Treaty of Versailles.¹⁶¹ The Soviets scoffed at the gift, as it added very little to their knowledge of submarine construction, but were eager to press forward in other areas. In August, Spindler requested that Zenker review some of the other Soviet requests, specifically the assistance of putting German naval experts in contact with the Red Navy. But Zenker declined, telling the Rear Admiral that “for the time being, we are to wait quietly and to see what steps the Russians are going to take.”¹⁶²

One more push was made on both sides for cooperation in the fall. Seeckt met with Zenker and “discussed the matter [of cooperation] at great length,” but failed to persuade the admiral of the “value of cooperation.”¹⁶³ In December 1926, the new head of the Soviet navy, Romuald Muklevich approached Niedermeyer in Moscow and proposed a new arrangement. Based on the newly established facilities at Tomka and Kama, Muklevich suggested the construction of a similar facility dedicated to submarine construction and training somewhere along the Black Sea coast.¹⁶⁴ Two weeks later, Niedermeyer sent another memo to Zenker, requesting some sort of reply for his Soviet counterparts. None was forthcoming.¹⁶⁵

From December 1926 until 1929, nothing was done in the field of naval cooperation. John Erickson argues that

the German Navy had found means other than escape into Russia to outwit the restrictions of Versailles, and the Soviet command, faced with the stark fact of the

¹⁶¹ Norman Polmar, Jurrien Noot, *Submarines of the Russian and Soviet Navies, 1718-1990* (Annapolis, MD: Naval Institute Press, 1991), p. 370.

¹⁶² “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 17.

¹⁶³ *Ibid.*

¹⁶⁴ *Ibid.*

¹⁶⁵ *Ibid.*, p. 18.

Kronstadt rebellion, had concentrated upon the political, rather than the technical reconstruction of the Soviet Navy.¹⁶⁶

There were three other important considerations. Fundamentally, the German Navy saw the Soviet Navy as a potential threat in the Baltic; on land, it was hard to envision a clash of German and Soviet forces without the prior elimination of Poland. Secondly, the Soviet Navy did not begin large-scale rearmament until 1933, well after the Red Army. At sea, however, the Soviets had little to offer: Rear Admiral Brutzer would write in the early 1930s that “the naval significance of the Baltic and Black Sea Fleets is not very great at present.”¹⁶⁷ Finally, the German Navy did not want to risk endangering its relatively friendly relations with a number of foreign states, especially Great Britain and Finland.¹⁶⁸

CONFERENCES AND CONSIDERATIONS, 1929 TO 1933

The political situation changed in seemingly more favorable directions in 1928. Zenker, who had been hostile towards Russia, left office and was replaced by Raeder that year. Further, Lohmann’s activities had become public knowledge, handicapping the navy’s illegal international work. In addition, in January 1928, Wilhelm Groener succeeded Otto Gessler as Minister of Defense. Gessler had enjoyed an excellent working relationship with Hans von Seeckt and his successor, Wilhelm Heye, in part because he simply left the military to its own devices. Groener, a career military officer, was much

¹⁶⁶ John Erickson, p. 251.

¹⁶⁷ Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 27.

¹⁶⁸ Ibid, p. 28.

more interventionist, as well as an active proponent of the military alliance with the Soviet Union. On February 18, 1929, Groener ordered Niedermeyer to raise “the question of establishing contacts between the two navies” with Voroshilov during a meeting in Moscow.¹⁶⁹

In Moscow, interest in naval cooperation had remained high. With the initiation of the Soviet Union’s first Five Year Plan in 1928, the emphasis in the Soviet Navy turned from “political reconstruction” to physical reconstruction. As noted earlier, the navy lost in the budgetary battles of 1928.¹⁷⁰ Perhaps to offset such losses, in late 1928, the Politburo resolved “to establish first contact between the Red Navy and the German Navy – the head of the RKKF [the Workers’ and Peasants’ Red Fleet] to visit Berlin and the head of the German Navy to come to Moscow.”¹⁷¹ In particular, the Politburo emphasized the need to seek cooperation in furthering “design achievements in the field of submarines.”¹⁷² The memorandum added that at the same time, “German penetration of the RKKF should be avoided.”¹⁷³

Voroshilov responded positively to initial German overtures, suggesting a summit of senior naval officers in Russia. *Chef der Marineleitung* Admiral Raeder, prodded by Groener, authorized the dispatch to Russia of Rear Admiral Brutzer, Chief of the Naval Command Office in Berlin, though his visit would be delayed for almost a year. Raeder also proposed that “cooperation would be organized best by the Army Staff due to its

¹⁶⁹ “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 20.

¹⁷⁰ David Stone, *Hammer and Rifle*, p. 125.

¹⁷¹ “Postanovoenie Politburo [Notes from the Politburo],” 1928, 33987-3c-329, RGVA, p. 2.

¹⁷² *Ibid.*

¹⁷³ *Ibid.*

connections with Russia and its experience in similar proceedings,” effectively leaving the details to Section T-3 of the Truppenamt. As a preliminary, Raeder asked T-3 to solicit answers on three questions from the Soviet Fleet: “a) what is the state of the Russian Navy and of its establishments, material and personnel? B) does the Russian Government intend to develop the Navy for offensive or defensive purposes? C) Whom does Russia consider her enemy in the East?”¹⁷⁴ Those questions would slowly be answered over the next two years.

T-3 supervised negotiations on naval matters with the Soviets throughout 1929, with the navy playing little role. The *Reichsmarine* received a series of concrete suggestions from T-3 for cooperation, all of which were rejected or went unanswered. As one German naval intelligence officer noted sardonically, it was the “well-known desire of T-3 to get the Marineleitung interested in the Russian navy and to counteract our well-founded skepticism.”¹⁷⁵ The nearest a proposal came to success was an offer to send naval aviators to Lipetsk for flight training. Raeder gave it serious consideration, but rejected it after T-3 and the Foreign Office made it clear that naval officers would have to follow the army precedent of “resigning” for a period of 18 to 24 months to avoid arousing suspicion. Raeder had hoped to dispatch his officers for periods of five or six weeks, and then return to Warnemünde; the idea of losing officers for two years did not appeal and a decision on the proposal was “postponed” indefinitely.¹⁷⁶

¹⁷⁴ “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 20.

¹⁷⁵ Ibid, p. 24

¹⁷⁶ Ibid, p. 20-21.

The navy was informed in late January 1930 that the T-3 had arranged for a visit of Soviet naval officers to Kiel. The head of this delegation was to be Admiral Orlov, commander of the Soviet Black Sea Fleet.¹⁷⁷ Departing Russia on February 20, Orlov spent two weeks touring German naval installations in Kiel, Wilhelmshaven and Hamburg, including a visit to the before sitting down with Admiral Brutzer at the Marineleitung Offices in Kiel on March 7.¹⁷⁸ The major treat for the Soviet delegation was a visit to the state-of-the-art *Panzerschiff Deutschland*, which would launch in 1931.¹⁷⁹ It was the German Navy's most advanced vessel, and had not been shown to any "foreign missions or attachés" up to that point.¹⁸⁰

During meetings with Admiral Brutzer in Kiel, Orlov asked a series of questions about the state of the German Navy which reveal a great deal about German naval strategy. First, Orlov asked what the German Navy saw as its primary mission. Brutzer replied that "although only small, the German fleet is a modern instrument of power and most certainly of value to any ally."¹⁸¹ Orlov then proceeded to ask about German naval operational doctrine and war-planning. Here Brutzer provided a convenient excuse: "the Navy considers the training of personnel as its main task" because of the limited number

¹⁷⁷ "Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff," p. 22.

¹⁷⁸ Philbin, p. 17.

¹⁷⁹ Doepgen, pp. 128-138.

¹⁸⁰ "Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff," p. 22.

¹⁸¹ "Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff," pp. 22-23. This was similar to Seeckt's vision for the army back in 1920: while not strong by itself, a small but highly mobile force could help break Germany's isolation by offering value in a coalition.

of vessels and technology available to them, and as a result there had not been any effort devoted to operational planning.¹⁸² This was, of course, a falsehood.

When the Soviets moved the conference to the subject of future cooperation, Admiral Brutzer replied that

We would like to visit Sevastopol and Leningrad.... To get an impression of the Soviet fleet. If I may be quite frank, I am less interested in the development of weapons in Russia since I believe we are ahead in this field. I should prefer to be able to have naval aviators trained in Russia as combat pilots in bombers and torpedo planes, that is in tactics prohibited for us under the Treaty of Versailles.¹⁸³

Despite Brutzer's pejorative tone, his answers seem to have left the door open for future cooperation, particularly in the vital field of naval aviation. Given the ongoing success at Lipetsk, and the fact that 1929-1931 saw the apogee of German efforts in the Soviet Union, the Soviet delegation could reasonably hope for concrete results in the future.

A few months later, Brutzer and a German team would return the Soviet delegation's visit, meeting the head of the Soviet Navy, R.A. Muklevich on July 26, 1930.¹⁸⁴ On this visit, the Germans were given far greater access than in 1926. They toured the Sevastopol "arsenal, ammunition depot, torpedo factory, aviation school and naval air squadron," the last of particular interest to the visiting Germans.¹⁸⁵ They visited the Black Sea Fleet's headquarters, watched anti-submarine drills and also visited the

¹⁸² "Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff," p. 23.

¹⁸³ "Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff," p. 23; Philbin, p. 19.

¹⁸⁴ Philbin, p. 20.

¹⁸⁵ "Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff," p. 26; Philbin, p. 20.

ship of future admiral Nikolai Gerasimovitch Kuznetzov.¹⁸⁶ The Germans also were given a tour of the then-under construction Dnieper Dam, one of the largest in the world and a central showpiece of Stalin's First Five Year Plan.

But the trip as a whole proved counterproductive for future cooperation. In his final report to Raeder, Brutzer ranked Soviet officers as low in quality, stating that the Soviet Baltic and Black Sea Fleets had "negligible combat power."¹⁸⁷ He also added that economic conditions were so poor in the Soviet Union that no naval officers should be sent to Russia for language training, lest they starve to death!¹⁸⁸ He did suggest that it would be worthwhile to continue working on some technical issues as a way of maintaining a degree of leverage over the Soviets, arguing that

It would be poor policy to allow the connections between the Russian Navy and our own to decay. We could, in the course of time, learn something from the Russians about weapons that we are not permitted to use. I feel it advisable to keep up relations by having officers participate in gunnery practice or by exchanges. I also recommend that we go halfway to meet the Russians in the purely material field, in which for the near future we shall certainly be the only ones who have anything to offer.¹⁸⁹

Despite this sentiment, the navy proved generally reluctant to offer any other concrete forms of cooperation in the aftermath of the Brutzer visit.

The final word on Reichsmarine-RKKF cooperation appeared on May 2, 1931. In a memo signed by Brutzer, but undoubtedly reflecting the views of Admiral Raeder as

¹⁸⁶ Philbin, p. 20.

¹⁸⁷ Philbin, p. 20.

¹⁸⁸ "Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff," p. 27. Given that the visit was less than 20 months from the beginnings of Holodomor, this was a fairly astute observation.

¹⁸⁹ "Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff," p. 27.

well, the German Navy rejected closer cooperation on three grounds. First, the need to be on decent terms with the American and English navies “forces the Navy to exercise a certain reserve towards Russia, at least outwardly.”¹⁹⁰ Cooperation with Russia would also interfere with the German Navy’s warm relationship with Finland. Second, Brutzer’s trip had “confirmed the impression that the Russian navy, far more than the Russian Army, is still in a very early stage of development.”¹⁹¹ The Red Fleet lacked operational value as a potential ally and possessed no technical materiel of value. Finally, there was the political angle: “no less important are the objections against close relations, which arise from considerations of disciplinary problems.”¹⁹² Putting German crews in close contact with Russian crews could expose them to the revolutionary “virus” and thus threaten the political stability of the German Navy.¹⁹³ The memories of 1918 and 1920 cast long shadows. As a result, the years 1919 to 1933 had produced little in the way of results; but there were to be two more phases of cooperation between the Reichsmarine and the RKKF.

COOPERATION UNDERWATER: THE STALINETS SUBMARINES, 1933-1935

On June 22, 1941, the Soviet port of Liepaja burned. Unprepared for the German onslaught, this crucial port of the Soviet submarine fleet found itself not only under

¹⁹⁰ “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 29.

¹⁹¹ “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 29.

¹⁹² Ibid.

attack from the air and the sea, but also cut off by German armored forces only 24 hours after the declaration of hostilities. As the bombs fell and the Nazi ring of steel closed, the commander of the Liepaja Naval Base, M.S. Klevenky, and local Red Army Major-General Dedayev, sparred over how to best deploy the submarine flotilla. Dedayev had ordered the evacuation of civilians as panic and rioting broke out in the city on June 23. He wanted the Soviet submariners to fight on land alongside his men. By June 24, with a powerful German flotilla holding outside Liepaja harbor, Klevenky gave his ship captains a choice: scuttle your ships and fight as infantry, or try to break out. Eight submarines were sent to the bottom of Liepaja harbor by their crews.

But onboard the S-3, the Soviet captain began to make preparations to get under way. His crew would be joined by more than 100 men from the S 3's sister ship, the S-1, as well as a number of civilian refugees. The S-3, designed by a Soviet-German engineering team, built with a German diesel engine and mounting a German gun, would face its baptism of combat against its makers.¹⁹⁴ The Soviet captain and his crew of 45 knew they would face a fierce test trying to escape the harbor, as German *U-Boats* and surface ships waited at the mouth, blocking the path to safety. And S-3 faced a further challenge. It had been under repair when the war began, and was unable to dive.¹⁹⁵ It would have to escape on the surface, relying on its two deck cannons to clear the way.

The crew of the S-3 had one stroke of luck in their favor. June 24 was a new moon. The night of their planned breakout was pitch black, illuminated only by distant

¹⁹⁴ Polmar, *Joot*, p. 262.

¹⁹⁵ Although not stated in the primary or secondary literature, presumably all of the other submarines in harbor required similar technical repairs – otherwise, one of them might have served as a better means of escape.

fires from the city lighting up the harbor. But as the S-3 glided out of the harbor at 5 knots, the sound of engines was audible in the distance. A pair of German torpedo boats caught sight of the S-3 and sped in to attack.

The first salvo of torpedoes went astray, but the German crews immediately opened fire with their 20 mm cannons. As bullets sprayed the foredeck, the Soviet crew bravely returned fire, but had trouble targeting the fast and maneuverable surface ships. The deck of S-3 became a living hell as the Germans tossed grenades onto the hull, trying to halt the progress of the Soviet submarine. Still the S-3 moved forwards inexorably. As gunfire exploded around him, the German commander of torpedo boat 60 ordered his men to drop a depth charge directly in the path of the S-3. Moments later, a huge explosion wracked the S-3 as its hull shattered and its German rivets, laid by Soviet hands in Leningrad shipyards, creaked and snapped. Water poured into the sub. Within minutes, the S-3 broke into three pieces, its crew and its passengers drowning or hurling themselves into the water. According to Soviet reports, the German torpedo boats then machine gunned survivors in the water as they floated helplessly.¹⁹⁶

The S-3 represented one of the most concrete products of Soviet-German naval cooperation. Its destruction at the hands of German torpedo boat crews in Operation Barbarossa offered a bloody conclusion to Soviet-German amicability at sea. Unlike other arenas, the relationship between the German and Soviet navies only began to become friendlier with Hitler's ascension to power. German corporate activity on naval affairs in Russia was minimal between 1924 and 1931, in part because the Soviet navy

¹⁹⁶ The Germans claimed they had picked up twenty survivors; the Soviets recorded three survivors.

simply did not have any money.¹⁹⁷ But prior to the Revolution, the Russian navy had been dependent on German shipbuilders and engine-makers. In 1914, the Russian navy had been awaiting the delivery of two light cruisers and four destroyers from German shipyards, as well as the boilers and engines of a significant percentage of their destroyer force.¹⁹⁸ Relations between German industry and the Soviet Navy would be renewed shortly after the war ended. In 1922, in the first of these exchanges, the Soviets paid German specialists to assist in the maintenance of what remained of the Baltic Fleet.¹⁹⁹ However, it was not until the Soviet naval building program really got underway that direct ties became increasingly important. Among the equipment purchases made from German firms were aircraft catapults from Heinkel, navigational equipment from Atlas, ship compasses from Anschütz AG, electrical motors from Siemens, and ship turbines from Brown-Boveri.²⁰⁰

The most important of these for the Soviets, prior to the realignment in Soviet strategic thinking in 1935, was accessing German submarine expertise. M.A.N., a company already working with the Soviets on a range of contracts – from farm equipment to tank engines – had been the world leader in building diesel engines for submarines during the last world war. Beginning on June 16, 1931, the Soviet navy placed orders for twelve enormous diesel engines of between 2000 and 2700 HP to power

¹⁹⁷ Stone, p. 125; p. 217. The Russian Navy received only 200 million rubles out of the 1.285-billion-ruble military budget of 1928-1929.

¹⁹⁸ Mitchell, pp. 288-289.

¹⁹⁹ Ibid, p. 356.

²⁰⁰ Röhwer, Monakov, p. 33. Brown-Boveri was a Swiss firm, but with its largest manufacturing facilities based in Germany.

submarines.²⁰¹ These engines were massive projects: each was the size of a large room, capable of powering the 1000 ton *Kreyser* class of submarine. The first of these arrived in 1934, and were installed in the Soviet “S” class of ships, which were based on German designs purchased in 1933.²⁰²

The “S” class Soviet submarine was the based upon the final results of the German covert submarine program. In 1933, after years of refusals, the *Reichsmarine* agreed to sell the Soviet Union several cutting edge German naval blueprints. The most important of these were the blueprints to Germany’s Spanish submarine project, the Type I.²⁰³ The first of these boats had been built by the Echevarrieta firm and put through its trials in Spain, as noted earlier. As Spain destabilized, the incentive to move the vessel and its blueprints became more urgent. In July 1933, IvS in the Netherlands transferred the designs to the Soviets, who requested some updates to the design plans, including “fitting more powerful diesel engines and a Soviet-designed deck gun.”²⁰⁴ Deschimag, one of the companies behind IvS, duly agreed to modify the plans in Germany. Six Soviet engineers arrived in Bremen and helped to supervise changes to the plans. Deschmiag then dispatched three of its engineers to the Ordzhonikidze Shipyard in Leningrad at the very end of 1934 to supervise construction, which was performed with German industrial equipment on loan from Germany.²⁰⁵ The engine was a MAN-built diesel engine; most of the major systems were imported from Germany. Three submarines would be built in

²⁰¹ “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 32.

²⁰² Polmar, *Joot*, pp. 80-81.

²⁰³ *Ibid*, p. 80.

²⁰⁴ *Ibid*, pp. 86-87.

²⁰⁵ *Ibid*.

Leningrad with German assistance, the S-1, S-2 and S-3.²⁰⁶ With 1070 tons submerged displacement, they were similar in class to the Type IIs then under construction in Germany. They would be called the *Stalinets* series (or Stalin-followers) by foreign military intelligence, although the Soviets would initially name them the *N-class* (for *Nemetskiy*, meaning German), only later changing it to “S” for *Sredniy* (Medium) class.²⁰⁷ In 1936, the Red Navy made some modifications to the design and produced the *IX-bis* Series. The major change here was the replacement of expensive foreign component parts with Soviet-made engines and internal components. The first of these Soviet-built submarines was commissioned in October 1939. A further set of modifications led to the *IX-bis 2*, which first appeared in April 1942. Altogether 25 Type IXs would be commissioned by the Soviet Union before 1941. An additional 17 were also built during the war. They constituted 9.5 percent of the Soviet submarine force and the bulk of the mid-tonnage submarine force when the war began in June 1941.²⁰⁸ German intelligence considered it “their [the Soviet Navy’s] standard and best boat.”²⁰⁹

But submarine cooperation would end as abruptly as it began. The reason that German military industry appears to have courted the Soviets with regard to submarine design were the broader plans of the German Navy. Great Britain again became a potential naval adversary in 1933. The need to develop a large and effective submarine force became imperative for the German Navy. The Soviet Union became a possible

²⁰⁶ Polmar, *Joot*, p. 87.

²⁰⁷ Rohwer, *Monakov*, p. 47.

²⁰⁸ Polmar, *Joot*, p. 93.

²⁰⁹ “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 32.

solution to that end from 1933 to 1935. The Reichsmarine's covert network of submarine construction and design was not capable of large-scale production. This became particularly clear when Spain descended into chaos in 1934, and the German contact there, Echevarrieta, was arrested for treason. But the window for cooperation would close abruptly as Germany's international situation improved.

On May 21, 1935, Hitler had renounced the Treaty of Versailles. Rather than reject Hitler's unilateral action, the Baldwin administration in Great Britain sought a new treaty designed to improve relations with the new Nazi state. On June 18, 1935, Germany and Great Britain signed the Anglo-German Naval Treaty.²¹⁰ This granted Germany permission to build submarines for the first time since World War I, as well as increase its naval tonnage to up to 35 percent of the Royal Navy's. Secret cooperation with the Soviet Union did not matter when the Reichsmarine/Kriegsmarine could openly build new submarines at home at less cost.

²¹⁰ There are a number of analyses of the Treaty and why Great Britain so quickly endorsed Nazi German rearmament. Some have argued that this was the beginnings of appeasement; others that it was better to impose some measure of control on the Germans rather than none at all; and others that the British ruling class sympathized with Germany on the issue of naval rearmament. For more, see Hines H. Hall III, "The Foreign Policy-Making Process in Britain, 1934-1935, and the Origins of the Anglo-German Naval Agreement," *The Historical Journal* (Cambridge, UK), Vol. 19, No. 2 (Jun., 1976), pp. 477-499 and Thomas Hoerber, "Psychology and Reasoning in the Anglo-German Naval Agreement, 1935-1939," *The Historical Journal* (Cambridge, UK), Vol. 52, No. 1 (2009), pp. 153-174.

*POSTSCRIPT: THE MOLOTOV-RIBBENTROP PACT AND THE APOGEE OF
COOPERATION AT SEA, 1939-1941*

From 1935 to 1939, the German and Soviet navies regarded each other as the primary adversary.²¹¹ But, in a sudden reversal, the period 1939 to 1941 represented the pinnacle of Soviet-German naval cooperation. In exchange for technology and parts, the Soviet Union supplied Germany with vast quantities of raw materials as well as logistical support for their ships at sea. This arrangement was formalized in the Economic Agreement of 1939.²¹² The Soviet Union guaranteed to provide vast quantities of natural resources: 1,000,000 tons of grain, 900,000 tons of petroleum, 500,000 tons of phosphates, and much more.²¹³ In exchange, Germany guaranteed the delivery of finished metals, machine tools, aircraft and naval armaments. The latter quickly proved to be the most contentious of the items on the list. The Soviets laundry list of desired items included:

the cruiser ex-Lützow, information on the trial results of Seydlitz and Prinz Eugen or Admiral Hipper; plans for the Bismarck and a large destroyer with 15-cm guns; and complete machinery for a large destroyer...electrodes for welding armor plate, boiler tubing; propeller shafts; electrical equipment; various boiler tanks; and motors; naval artillery including one fully equipped 38.1 cm double turret, to be delivered by 1 March 1941; preliminary sketches for a 40.6 cm triple turret; and working drawings for a 28-cm turret...mine gear, torpedo gear; a periscope; and marine acoustical devices... and precision technology items including marine clocks and watches and hydrographical instruments.²¹⁴

²¹¹ As noted earlier, the Soviet Union moved to conduct most of their war games and operational plans with Germany as the primary enemy beginning in March 1935. The Germans had done the same with the Soviet Union somewhat earlier.

²¹² Philbin, p. 44.

²¹³ Ibid, p. 47.

²¹⁴ Ibid, pp. 46-47.

This was technology exchange on an extraordinary scale; the items in question were worth hundreds of millions of Reichsmarks.²¹⁵ At the same time, the raw materials provided by the Soviet Union were of desperate need, particularly before the Wehrmacht's success in France. German naval efforts could not have been maintained from February 1940 to May 1941 without Soviet assistance: nearly all of the Russian crude oil went directly to the German naval base at Wilhelmshaven.²¹⁶

The dictators, both of whom were deeply interested in their navies as prestige symbols, would dance around the terms of their agreement over the next year and a half. Hitler ordered his subordinates to delay naval equipment deliveries as long as possible. In turn, Stalin would suspend resource shipments several times in 1940 to exert pressure on Hitler to deliver on the naval parts of the commercial treaty as promised.²¹⁷ In sum, these exchanges would result in the delivery to the Soviet Union of vital shipbuilding plans, the unfinished battle cruiser *Lützow* (renamed Petropavlovsk), a long list of ship parts, gun turrets and coastal defense artillery. The latter two categories arrived in small numbers; however, Soviet engineers would reverse engineer them, mastering new developments in German naval technology.

²¹⁵ The sum total of economic exchange with the Soviet Union in 1940 was around 400 million Reichsmarks; by comparison, the combined Army-Navy budget in the Weimar period had been around 700 million Reichsmarks. Philbin, pp. 47-48.

²¹⁶ Philbin, p. 48.

²¹⁷ Stalin's hopes seem to have been threefold: to use purchasing negotiations to gather valuable intelligence about German naval production and technology; to gain leverage over the German war machine by supplying vitally needed raw materials; and to slow down the German military's expansion by demanding items produced by "bottlenecks" in German industry. His knowledge of naval technology impressed his German hosts considerably. But Stalin had been too clever for his own good. He was so sure he was winning the exchanges with Germany at the negotiating table that it blinded him to Hitler's ideological obsession with destroying the Soviet Union. Philbin, p. 48.

Besides technical and economic exchange, naval cooperation came in other forms. The first began within weeks of the Non-Aggression Pact. On September 6, 1939, the German ship *Bremen* steamed into Murmansk harbor. Over the next month, seven other German-flagged merchantmen arrived in Murmansk, where they were “well-received.”²¹⁸ The German Foreign Ministry requested Soviet assistance in transporting the cargo of these vessels via rail to Leningrad, where they could be retrieved by other German vessels. But more importantly, on September 11, the German ambassador in Moscow wired Berlin to note that “Molotov informed me today that the Soviet Government agrees to our proposal to convert motor ship *Iller* into an auxiliary cruiser and will assist in this matter.”²¹⁹ This meant arming *Iller* and operating commerce raids out of Murmansk harbor, a clear step away from Soviet neutrality.

Realizing this could potentially involve them in war, the Soviets altered their proposal slightly twelve days later. Molotov informed Ambassador von der Schulenberg that “Murmansk was not sufficiently isolated for this purpose [for harboring German warships].” Instead, Molotov suggested the possibility of using an empty bay east of Murmansk for whatever purposes the Germans desired.

The surprisingly generous line from the Soviet government amazed Admiral Raeder and the Kriegsmarine; it “opened up entirely new operational possibilities for the German Naval High Command.”²²⁰ During a meeting on October 12, Raeder and his staff drew up a list of requests to be made to the Soviet Navy based upon their willingness to

²¹⁸ “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 38.

²¹⁹ Ibid.

²²⁰ Ibid, p. 39.

assist on the *Iller* and the offer of a Soviet harbor. The list was extraordinary, more or less requiring Soviet entry into the war on the German side. It included “the use of suitable harbors, say Murmansk and Vladivostok” as bases for German warships; assistance in supplying German commerce raiders in both the Atlantic and Pacific; repair and maintenance assistance on German vessels in both oceans; the use of Soviet flags to cloak German naval convoys as “neutrals” in the Atlantic and Baltic; and the cancellation of “all direct or indirect Russian exports to the enemy countries.”²²¹

The immediate response of the Russians to these requests was cautiously positive. On October 22, the German Naval Attaché in Moscow, Otto von Baumbach, relayed the news to Berlin that

a new offer was submitted...placing Zapadnaya Litza [Bay] at our full disposal... in this bay, Germany may do whatever she wishes; she may carry out whatever projects she should consider necessary. Any type of vessel may be permitted to call there (heavy cruisers, submarines, supply ships).²²²

The confirmation of this earlier offer was immediately seized upon. Admiral Raeder ordered Naval Attaché Baumbach to travel to Murmansk and select two ships for conversion as a floating submarine support base in Zapadnaya Litza, now called “Basis Nord” in German communiques. An Assistant Naval Attaché arrived in Murmansk on November 28, 1939 to supervise the transfer of goods and military stores to the selected vessels, the *Phonecia* and *Cordillera*.²²³

²²¹ “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 40.

²²² Philbin, p. 83.

²²³ Ibid, p. 99.

In late November, as the small German flotilla in Murmansk prepared to depart, Admiral Dönitz (*Befehlshaber der Unterseeboote*, Commander of the Submarines) ordered the U-36 to make the inaugural voyage to Basis Nord. The U-36 was to rendezvous with a Soviet vessel which would guide it to the bay. Once there, U-36 would assess the suitability of Basis Nord for submarine operations. This presaged plans to station two submarines at Basis Nord permanently, striking at British shipping in the North Sea and along the Norwegian coast.²²⁴ However, the U-36, on its voyage along the Norwegian coast, was spotted by British aircraft. On December 5, 1939, the British Submarine *Salmon* encountered the U-36, firing a single torpedo at the U-36 before the Germans were even aware of the *Salmon's* presence. The U-36 went down with all hands. A second submarine, the U-38, had been issued with similar reconnaissance orders – but interestingly, no instructions on rendezvousing or communicating with the Soviet navy – arrived near Basis Nord at the end of November.²²⁵ After conducting a survey of the bay, the vessel returned to Germany.

By early December, Basis Nord hosted three German supply vessels, communications equipment and a Kriegsmarine Lieutenant Commander, Karl Nieschlag.²²⁶ However, no submarines arrived between December 1939 and February 1940. In February 1940, the powerful battlecruiser *Admiral Hipper*, operating off the coast of Norway, was ordered to resupply at Basis Nord in preparation for continued attacks on shipping in the North Sea. The Soviet Navy agreed to provide fuel and

²²⁴ Philbin, p. 92.

²²⁵ Ibid, p. 97.

²²⁶ Ibid, p. 109.

logistical support for the operation.²²⁷ But a British reconnaissance aircraft spotted the *Admiral Hipper*; the captain decided continuing his journey was too dangerous and returned to Wilhelmshaven on February 20.²²⁸

Basis Nord remained in operation until September 1940. After June 10 (when the Wehrmacht completed the conquest of Norway) its strategic value was limited. In the end, Basis Nord only once provided any logistical support to combat operations. During the critical Battle of Narvik, the *Jan Wellem*, a large cargo ship stationed at Basis Nord, set sail to provide vitally needed oil to the German Naval force anchored at Narvik. Its arrival enabled the Kriegsmarine fleet to protect the landing of forces into Narvik from British attacks.²²⁹

The price of Soviet assistance with Basis Nord was not cheap for the German Navy. First, it effectively guaranteed German non-intervention in the complicated negotiations ongoing between the Soviet Union and Finland. The Soviets noted that “the appearance of German naval vessels...might serve as encouragement to the Finnish (Government) during the present Russo-Finnish negotiations.” Further driving home Soviet interests in the Baltic, immediately after the establishment of Basis Nord, the Soviets requested, and were granted, that no German submarines would operate in the eastern half of the Baltic in the “Soviet sphere.”²³⁰

²²⁷ Philbin, p. 109.

²²⁸ Ibid, p. 109.

²²⁹ After its successful refueling of the German destroyer force at Narvik, the *Jan Wellem* was scuttled by its crew after unloading vital cargo in an effort to avoid capture by the Royal Navy.

²³⁰ “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 42.

On November 30, 1939, the Soviet Union invaded Finland. Within hours, the Soviet Navy had requested direct military assistance from the Kriegsmarine in two forms. First, they asked for “German support in the laying of anti-submarine barrages off the Finnish coast.”²³¹ Second, they requested that German vessels supply Russian submarines maintaining a blockade of Finnish ports. The German Navy, despite deep sympathy for Finland, immediately and eagerly responded to the requests. The possibility of reciprocal aid of a similar kind – namely the resupplying of German submarines in both the Atlantic and Pacific by neutral Soviet vessels – was immediately grasped by the Marineleitung.²³²

Interestingly, the Soviets made more and more noise about the urgent need for receiving fuel supplies for their Baltic submarine flotilla. The German Navy moved quickly. Four days after the initial request, the Kriegsmarine had completed the conversion of a merchant ship to carry fuel with equipment for connecting with a Soviet submarine.²³³ The German Naval Command informed its attaché in Moscow that the supply ship could sail on 48 hours’ notice, and that the Germans were waiting only for three Soviet naval officers to arrive as liaisons. Then, to the shock of officers in Kiel, the Soviets cancelled their request. The Germans believed the Soviets were testing the limits of their alliance and German neutrality: “by taking practical steps to carry out the project, we had shown the Russians that they can rely in an emergency on the German Navy within the limits of what is possible.”²³⁴ German alacrity on the issue of assistance further

²³¹ “Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff,” p. 43.

²³² Ibid, p. 43.

²³³ Ibid, p. 44.

²³⁴ Ibid.

opened the door on possible cooperation, leading to the most direct joint military venture executed by the two navies.

On January 10, 1940, a month after the Baltic submarine incident, the Red Fleet and the Kriegsmarine reached an accord for German passage through the Northern Sea Route.²³⁵ This was a potentially momentous occasion: with Soviet assistance, it would be possible to dispatch an entire fleet to the Pacific to harass and interdict British merchant vessels. Soviet icebreaker technology, far ahead of anyone else in the world, had made such a passage possible by specially modified ships. Initially, the Kriegsmarine proposed to send an armada of 26 ships to the Pacific to wreak havoc on British supply lines.²³⁶ But the difficulties of the naval war in the Atlantic and the Kriegsmarine's strained resources diminished this number to six vessels, then to four, and finally, by July 1940, to two: the *Esso* and the *Komet*.

The voyage started poorly: The *Esso* ran aground off the coast of Norway. The *Komet*, commanded by famed naval raider *Konter-Admiral* Robert Eyssen, arrived off the coast of Murmansk. However, confusion and bureaucratic issues in Moscow meant that *Komet* had to wait nearly a month for its Soviet icebreakers, the *Lenin* and the *Stalin*.²³⁷ Finally, on August 13, the *Komet* departed for its long journey with the *Lenin* leading the way. After perils and more than a few mishaps in the icepack, the *Komet* reached the open sea northwest of the Barents Straits. The passage had taken 23 days, the fastest

²³⁵ Philbin, pp. 132-133.

²³⁶ "Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff," p. 136.

²³⁷ *Ibid.*, p. 139.

traverse of the Northern Route in history.²³⁸ The *Komet* was also the largest vessel by displacement to make the voyage. In September, after a brief stop in a Soviet harbor, the *Komet*, disguised as a Japanese merchant ship, made on its way to the South Pacific. During its successful maritime chevauchee, the *Komet* would sink nine ships displacing nearly 43,000 tons and capture a tenth, which was crewed and sailed back to Germany.²³⁹ The *Komet* would successfully dodge British vessels and reach the safe harbor of Hamburg on 30 November, 1941, having successfully circumnavigated the globe. Had twenty-six German vessels reached the Pacific, it might have spelled disaster – at least until the American entry into the war. Instead, the journey of the *Komet* provides little more than an interesting footnote in the broader history of the war.

CONCLUSION

Soviet-German cooperation at sea followed a much different pattern than it did on land. Despite opportunities, years of negotiations and frequent contact between the two militaries produced relatively little fruit. The only exchange which could be said to have had a strategic impact on the course of the Second World War was that of the 1939 Economic Treaty, which provided vital fuel for the Kriegsmarine and a haul of naval technology and equipment for the Red Navy. The unfulfilled promise of cooperation, so desired by the Soviets, also played a vital role in the continuing dialogue between the two states from 1939 to 1941. Indeed, one of the major reasons for Stalin's insistence that

²³⁸ "Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German General Staff," p. 141.

²³⁹ *Ibid.*, p. 108.

Germany would not attack in 1941 may have been the state of naval cooperation: the Germans had promised numerous materiel deliveries and an exchange of naval officers to take place in the summer of 1941.²⁴⁰ Naval Attaché von Baumbach had been invited to visit Kronstadt Naval Base; his tour was scheduled for June 23.²⁴¹

Why did Soviet-German cooperation not proceed further? In the late 1920s, the situation seemed ripe for collaboration. Admiral Raeder was an admitted Russophile who sought to aggressively expand the German Navy. The Soviets began a naval reconstruction program in 1928, just as the Reichsmarine began its *Panzerschiff* program. And Stalin openly courted German naval assistance throughout the period. Unfortunately for the Soviets, the Reichsmarine's success from 1922 to 1931 in building submarines abroad hamstrung the Soviet negotiating position: with tanks, chemical warfare, aircraft and other areas, the Soviets could offer space for German technology. But the German Navy had found its necessary space elsewhere. Further, the willingness of the British Navy to allow the German Navy rearm meant that it possessed greater flexibility at home than did the German Army. It could build world-class battlecruisers openly as early as 1928. Soviet desire to work with the Germans was clearly high, but they lacked the bargaining position to attract the German Navy.

The failures of Soviet-German naval cooperation offer a number of interesting insights on the nature of cooperation more generally. The German Navy clearly viewed the Soviet Union as a greater threat than did Seeckt and the Army. The reasons for this

²⁴⁰ Philbin, p. 126.

²⁴¹ Ibid, p. 127.

stemmed both from the geographic context – the German Army could not fight the Soviets directly while Poland existed – as well as the unique experience of the German Navy in the crises of 1918 and 1920.²⁴² Simply put, the German Navy viewed Bolshevism as an existential threat while the Army did not. This viewpoint helps explain how the conservative Raeder worked well alongside Hitler from 1933 to 1942, while the senior army commanders such as Schleicher, Blomberg, Hammerstein-Equord and others, all of whom who had championed an alliance with Russia, were all either murdered or removed from their positions by the Nazis.

The most portentous role of naval cooperation came at its conclusion. Stalin's plans to build a grand fleet required outside assistance in a manner that the Soviet Union had not required since 1933. His personal investment and management made it one of the Soviet Union's top priorities. The initial proposed list of naval equipment to be exchanged for raw materials after the concluding of the Molotov-Ribbentrop Pact was extraordinary: four complete cruisers, two cruiser hulls, 15,000 tons of armored plating, the most up-to-date blueprints for battleships, aircraft carriers, dozens of naval guns of six different calibers, torpedoes, mines, navigational equipment and much more.²⁴³ The possibility of German assistance in Soviet naval development played a role in the conclusion of the Molotov-Ribbentrop pact. Naval technology was foremost on the lists

²⁴² Interestingly, the Reichsmarine's war planning centered on a Polish-French attack on Germany, just as the Army's did, through 1922. Werner Rahn, *Reichsmarine und Landesverteidigung 1919-1928: Konzeption und Führung der Marine in der Weimarer Republik* [] (München: Bernard und Graefe, 1976), p. 115-116.

²⁴³ "Russo-German Naval Relations, 1926-1941: A Report Based on Captured Files of the German Naval Staff," pp. 76-77. For the Germans, the scale of the requests was almost overwhelming. Hitler personally reviewed each request with Raeder to discuss the potential impact on German military strategy, and reduced it to the much shorter list of deliveries noted above.

prepared by Stalin. Would Hitler's war machine have received the necessary oil during the conquest of France and the Battle of Britain if it had not had naval equipment and vessels to sell to the Soviet Union? The 5.6 million barrels of oil that arrived from the Soviet Union in 1940 and 1941 were essential for the German successes in Western Europe and the Atlantic. And it was made possible by Soviet hunger for German naval equipment, satisfying a twenty-year quest for assistance in the development of the Red Fleet.

CONCLUSION

REAPING THE WHIRLWIND

At four am on June 22, hundreds of warplanes flew over us. Everyone at first thought it was some huge thunderstorm. So we ran out of our tents and saw an incredible number of planes overhead. And that's when we knew it was war....It was sheer horror when the Germans started shelling us. Huge artillery explosions next to us, horses screaming, people screaming for help.²⁴⁴

So Leonid Rosenberg, a Red Army lieutenant in an artillery battalion, recalled the beginnings of the German invasion. In Moscow, an incredulous Stalin told Foreign Minister Molotov to find German Ambassador Schulenberg. He duly arrived, “stiffly informing Molotov that a state of war now existed between Germany and the Soviet Union. All Molotov could stutter was ‘What have we done to deserve this?’”²⁴⁵

The bargain that Soviet leaders had made to arm themselves with German assistance would pay its final dividend in blood. Their arrangement, based upon economic exchange and military cooperation, could justifiably be described as an “alliance.”²⁴⁶ But the Soviet-German pact in the interwar period hinted at something larger. From Trotsky to Seeckt, policy makers in each regime saw the future of the two states as intertwined. German Ambassador Brockdorff-Rantzau called the Soviet-German

²⁴⁴ “Interview with Leonid Rosenberg, Witness: Operation Barbarossa,” Witness History Podcast Series, BBC News, 2011, accessed 2015. <http://www.bbc.co.uk/programmes/p00h9rx0>

²⁴⁵ Richard Overy, *Russia's War* (London: Penguin Books, 1997), p. 74.

²⁴⁶ The Soviets and the Germans had formed a “relationship based on an affinity in interests” and “formed for mutual benefit.” This is the Oxford University Dictionary definition. “Alliance,” in the Oxford Dictionaries, Oxford University Press, accessed January 2016, http://www.oxforddictionaries.com/us/definition/american_english/alliance .

relationship a *Schicksalgemeinschaft*, a “community of fate.”²⁴⁷ The term suggested that the destinies of the two states were bound together, for good or for ill. The Germans hoped that the Soviet Union would serve as allies against the West, a role that the Soviets did in fact fulfill from 1939 to 1941. In turn, Soviet revolutionaries from Lenin to Stalin had seen in Germany a future partner in revolution. It was a part that would be forced upon East Germany for five decades. The future of both regimes and hundreds of millions of people had been inextricably linked.

The culprit was more than mere geography. The “community of fate” dated from 1917, when the German High Command dispatched Lenin from Switzerland in a sealed train car. In that moment, Germany’s warlords demonstrated their willingness not just to defeat the Tsarist state, but destroy it entirely.²⁴⁸ Lenin had equally little compunction about overthrowing the German regime once he gained power. This new rejection of not just the status quo but the very community of nations was novel. Total war – in means, but also in ends – was born between Berlin and Moscow in 1917.²⁴⁹

²⁴⁷ Hilger, Meyer, p. 131.

²⁴⁸ German and Allied war aims through 1917 were largely territorial. They did not envision the destruction of their opponent’s political order. Though the subject of war aims is deeply controversial, it is clear that the Allies did not even discuss regime change in Germany in a serious way until after the February Revolution in 1917, which recast the warring sides as ideological opponents. Even in January 1918, Woodrow Wilson cautiously avoided any discussion of the destruction of Germany’s government when he framed his “Fourteen Points.” The Germans were the first to embrace this way of war. As Fritz Fischer’s famous work *Griff nach der Weltmacht* argues, after the failure of peace feelers in 1916, the German government became increasingly committed to a program that envisioned Poland, Belgium and much of Eastern Europe as German satellites. By 1917, the German High Command had willingly embraced the prospect of “regime change” against one of the major Allied powers.

²⁴⁹ It is no coincidence that the phrase “Total War” in the modern sense was first used in the writings of Erich Ludendorff. Drawing from Clausewitz’s notions of absolute war, Ludendorff said that the expansion of the last war through new technologies like the “multiplication of planes and bombs of all kinds,” and the social war seen through “leaflets and propaganda material” had “birthed total war... that directly touches the life and soul of every member of the warring peoples.” Erich von Ludendorff, *Der Totale Krieg* (Munich: Ludendorffs Verlag GmbH, 1935), p. 5.

On August 19, 1939 the Soviet Union and Nazi Germany agreed to a commercial arrangement. It effectively restarted the industrial-goods credit for raw materials exchange that had become commonplace between 1926 and 1933. Two days later, Stalin cancelled a planned meeting with British and French delegates to discuss military possibilities against Germany. On August 23, German Foreign Minister Joachim von Ribbentrop met with Stalin and reached an agreement for a non-aggression pact. Its secret provisions divided all of Eastern Europe between the two totalitarian dictators. Most importantly, its Secret Protocol included the provision that “In the event of a territorial and political rearrangement of the areas belonging to the Polish state, the spheres of influence of Germany and the U.S.S.R. shall be bounded approximately by the line of the rivers Narev, Vistula and San.”²⁵⁰ The Molotov-Ribbentrop Pact was a blueprint for war.

The Pact of August 23, 1939 was the final culmination of a twenty-year-long crusade by both sides to arm themselves and destroy their mutual enemy, Poland. Despite the shock of the world, the Molotov-Ribbentrop Pact was functionally a return to a policy that had been paused for less than six years. The explicit military provisions were new, but the world situation had changed to accommodate the plans that had been discussed against Poland in the 1920s. And the two states resumed the military-economic relationship that had been paused in 1933. Germany again began to send its officers to the Soviet Union to advise and assist the Soviets in training and technical development. The Soviets again hosted German military activity on their soil, though for the first time, this

²⁵⁰ “The Molotov-Ribbentrop Pact, 1939,” Modern History Source Book, Fordham University, <http://legacy.fordham.edu/halsall/mod/1939pact.html>

work was naval in nature. And once again, in exchange for huge quantities of raw materials, the Soviets began to buy military equipment in large quantities. By September 1, 1939, Germany and the Soviet Union shared a border, a capacity for making war, and an ideological framework of annihilation. The stage was set for the Second World War.

SEECKT'S VISION FULFILLED?

The preparations for that war had begun before the ink was dry on the Treaty of Versailles. Historian Gerhard Förster summed up Seeckt's strategic thought thus: "We need to become powerful; once we again have power, we will, naturally, take back all that we have lost."²⁵¹ It was a vision of violence that guided the Reichswehr through more than a decade of peace. Seeckt's interpretation of the First World War and his doctrinal flexibility gave the Reichswehr a tremendous advantage in tactical terms. It developed an innovative system predicated on initiative, mobility and combined arms which would serve as the bedrock of the Wehrmacht's early successes. Seeckt argued that a mechanized, technically proficient force could overcome the difficulties of numerical inferiority imposed on the German Army. But his vision of a small, modern force of elite officers equipped with the best possible materiel was ultimately hamstrung by the limitations of Versailles. As he wrote, "The Frenchman has occupied the Ruhr area. The Lithuanians have occupied the Memel area. Instinctively, the hand goes where the sword used to be. It only grabs air: we are unarmed. Today, one cannot conduct a war with flails

²⁵¹ Gerhard Förster, *Totaler Krieg und Blitzkrieg: Die Theorie des Totalen Krieges und des Blitzkrieges in der Militärdoktrin des Faschistischen Deutschlands am Vorabend des Zweiten Weltkrieges [Total War and Blitzkrieg: The Theory of Total War and Blitzkrieg in the Military Doctrine of Fascist Germany on the Eve of the Second World War]* (Berlin: Deutscher Militärverlag, 1967), p. 11.

and hayforks.”²⁵² By 1922, the first industrial efforts at replacing those “flails and hayforks” with tanks and aircraft had begun at Fili. By 1924, the Reichswehr was commissioning aircraft prototypes for testing in Russia. Two years later, the Reichswehr had restarted its armored warfare program.

In 1926, as German industry prepared again to mass produce weapons of war, the Allies disbanded the military component of the Inter-Allied Commissions of Control. Its final report, delivered in January 1927, was ominous: “Germany has never disarmed, has never had the intention of disarming, and for seven years had done everything in her power to deceive and ‘counter-control’ the Commission appointed to control her disarmament.”²⁵³ Yet the Allies lacked both the political willpower and the reach to effectively end Germany’s secret rearmament programs. By 1933, every major aviation firm and most of Germany’s larger firms had been working on war materiel in violation of Versailles for almost a decade. Nearly all either had engineering teams, test pilots, business representatives or prototypes at one of the secret Soviet-German bases in Russia.

During the interwar period, it took an average of four years to develop an armored vehicle or aircraft frame from specifications to mass production. A new engine system took around six. A full generation of tanks and planes were developed and tested prior to the beginnings of open rearmament under Hitler. Historians have underestimated the role of Soviet-German cooperation in part because so few of the technologies tested from 1922 to 1933 entered mass production. But that is besides the point; prototypes are

²⁵² Cited in Strohn, pp. 330-331.

²⁵³ Whaley, p. 33.

designed to be pushed to point of failure.²⁵⁴ The “failures” in Russia were immensely valuable: they allowed for experimentation, selection and rejection, in addition to providing vital training to German engineers. The timing of prototype testing was crucial: most of the major German weapons systems began with specifications created in 1933 or 1934 by the Reichswehr Weapons Office. In other words, the design and testing work in Russia had effectively determined the technical requirements of the next generation of weapons systems. These technologies would reach mass production in 1937 or 1938, which usually meant that they were the most advanced technology of war on the battlefield. Historian Barton Whaley wrote that “Fifteen years of dissimulation gave a Hitler an instrument that he could either build, in about five to ten years, into a major military force, or even more quickly, into a plausible bluff force” to achieve his immediate goals in Germany’s borderlands.²⁵⁵ The secret design, testing and development work in the Soviet Union was one of the two critical components of that process, alongside the efforts at dissimulation and counterintelligence inside Germany that began in 1919.

While the IAMCC focused its attention on Germany’s factories and ports, the Reichswehr was busily violating Versailles by rebuilding its officer corps in the Soviet Union. Between 1922 and 1933, nearly 1,000 officers and men attended training programs in Russia. More than 60 of them would become generals, the cadre at the core of the reborn Luftwaffe and Wehrmacht’s Panzer divisions. In addition, dozens more

²⁵⁴ See Jonathan Coopersmith, “Failure and Technology,” *Japan Journal for Science, Technology and Society*, Vol. 18 (2009), pp. 93-118.

²⁵⁵ Whaley, p. 100.

senior or future senior officers visited and observed exercises at the secret facilities. Given that the Reichswehr was limited to only 4,000 officers under the terms of Versailles, this was a massive undertaking. The finances of secret cooperation further highlight this: The Reichswehr's training inspectorate had a budget of about ten million Reichsmarks a year, three million of which went annually to secret projects in Russia.²⁵⁶ This sum does not include the twenty million Reichsmarks in "blue funds" provided by the German government for Lipetsk, nor the tens of millions of Reichswehr and corporate funds used to build Fili, Volsk or support the technical work at Lipetsk, Kama and Tomka. The Reichswehr was deeply committed to building its future cadres on Russian soil.

Those same facilities played a role in the German development of doctrine. Lipetsk was responsible for the Luftwaffe's first manual for fighter pilots. Kama played a central role in the development of armored warfare thinking in Germany, as its top theorists taught or visited. Tomka convinced the Reichswehr of the limited utility of chemical weapons for the next war. In addition, crucial aspects of German doctrine developed from witnessing Soviet maneuvers and technologies. As Edward Homze argued, "The Red Army's strong emphasis on close air support for ground forces impressed many German officers, and much of the later German thought about the use of fighter-bombers and assault aircraft can be traced to their Russian experiments."²⁵⁷ The most concrete product of this borrowing was the Stuka dive bomber, tested and

²⁵⁶ Speidel, pp. 23-24.

²⁵⁷ Homze, p. 21.

developed at Lipetsk. The reluctance of the German Air Force to embrace strategic bombing (though this idea had plenty of advocates) played a major role in the development of the air war. The Luftwaffe chose to focus on ground-attack aircraft rather than strategic bombers. The failure of the Luftwaffe to develop a successful four-engine bomber would haunt them during the Battle of Britain.²⁵⁸

Soviet doctrine and technology similarly impacted German ideas of armored warfare. By 1933, the Red Army had a large and diverse collection of armored vehicles. They had also done a great deal of thinking about the operational deployment of armored vehicles. While witnessing maneuvers at Kama, Guderian was first convinced that the Reichswehr should shift the bulk of its tank forces from the light tank to the medium tank.²⁵⁹ Even so, the failure to identify the disparity between Soviet and German concepts of “medium” and “heavy” tank would prove a major problem for the Wehrmacht as the war continued. While the Reichswehr learned from the RKKA, it would have been better prepared for the next war had they paid closer attention to Soviet technical work. Hubris doubtless limited their vision.

Of Seeckt’s main objectives – a military-industrial partnership, technological development and the creation of an officer cadre – only the first did not come to fruition. And in addition, working with the Red Army led to major innovations in doctrine that he could not have foreseen. The military restrictions of Versailles had in fact cost the Reichswehr little. Had Great Britain and France been willing to aggressively enforce their

²⁵⁸ The Heinkel He-177 was the only four engine bomber to reach mass production, but it was produced only in small numbers and failed to make a major impact on the war. Homze, p. 229.

²⁵⁹ Habeck, p. 162.

mandate, the course of events would have been very different. But they ignored the minor transgressions. By the time they learned of the major ones – Fili, for instance – their policymakers had grown used to turning a blind eye.

SOVIET PROFITS FROM THE ALLIANCE

While the Germans profited greatly from their covert work in Russia, it was Stalin, not Hitler, who would triumph by 1945. By 1941, the Soviets had partially remedied the three great weaknesses of the Tsarist regime in the First World War: a disunited home front, the weakness of the officer corps and the lack of heavy industry to support an extended war effort. To the first, the Stalinist state possessed, in its vast security apparatus, an instrument of terror against its own people far more coercive than anything the Tsarist state had mustered.²⁶⁰ Combined with the horror of the Nazi program and the Great Russian nationalism it stoked, the Soviets would enjoy a relatively united home front throughout the war. The latter two deficits – leadership and technical-industrial – would be redressed in part through cooperation with the Germans.

Soviet-German cooperation transformed the Red Army. Melville would write that the Russian Army had a “German Face” in 1933.²⁶¹ Such an approach fails to recognize

²⁶⁰ This is not to say that Stalin increased the security of the Soviet Union through democidal, totalitarian measures that involved the murder of millions of Soviet citizens. If anything, the combination of purges, collectivization and reliance on slave labor drastically weakened Soviet security. Nonetheless, they did address to a degree the central causes of defeat in the First World War. Stalin was fortunate that the Nazis were such monsters; even the harsh occupation policies of the German Army in World War I might have been viewed as preferable to Soviet ones in Soviet borderlands and altered the outcome of the war. Nazi policies turned a Soviet weakness into strength.

²⁶¹ Cecil F. Melville, *The Russian Face of Germany, An Account of the Secret Military Relations between the German and Soviet-Russian Governments* (London: Wishart Publishing, 1932).

the tremendous originality and innovation developing independently within the Red Army by 1924. The richness of Red Army military thought, particularly between the Russian Civil War and the Stalinist turn, had been made possible by the destruction of the old Imperial army, but not its personnel. New ideas were welcomed in the theoretical vacuum created by the Revolution. Historian Bruce Menning wrote that “many of the same forces that had swept away the old military order in 1917 also fueled the impulse to challenge outmoded and discredited ideas of warfare.”²⁶² The work of the great Soviet military theorists – Frunze, Svechin, Triandafillov, Tukhachevsky and the slightly later G.S. Isserson²⁶³ – bore less continuity with their national historical military experience and body of doctrine than theorists in any other state in the world. This freed them to identify qualitative changes in the nature of warfare.

Nevertheless, interactions with the Germans had a significant effect on Soviet theoretical dialogue during this period. When new German military manuals appeared during the period of cooperation, the Reichswehr immediately offered them to their Soviet counterparts.²⁶⁴ At the cooperative facilities, the Red Army’s top practitioners and theorists interacted with many of Germany’s. Many of the major Soviet theorists in the interwar period spent time in Germany, such as Sediakin (1932) and Tukhachevsky (1925, 1932). The most important Soviet military theorist writing during the period of cooperation Vladimir Triandafillov, visited Germany multiple times: he spent one month

²⁶² Menning, “Introduction,” pp. viii.

²⁶³ Isserson was the only major theorist to survive the Great Purges, and as such, had a tremendous role in reformulating the ideas of earlier thinkers during the Second World War.

²⁶⁴ “Protokoll der Besprechung zwischen Herrn Alksnis und Herrn Molt am 26.3.1932 in Mo. [Minutes of a meeting between Herr Alksnis and Herr Molt on March 26, 1932 in Moscow],” March 26, 1932, RH12/I/60, 63-71, BA-MA, p. 1.

in Germany in 1927, two months in 1928 and four months in 1930.²⁶⁵ Georgy Isserson, the sole member of the Tukhachevsky circle to survive the Great Purges, spoke German as a first language as a product of his upbringing in the Baltic States.²⁶⁶ His first tactical publication was entitled “Contemporary German Infantry.”²⁶⁷ He also spent time in Germany during the period of cooperation, where he was told to “study the German army’s combat training procedures... and studying the *Reichswehr*’s methods of staff work.”²⁶⁸ The impact of German thinking upon Isserson, Triandafillov, Tukhachevsky and others was profound.

In early Soviet military manuals, and the writings of Tukhachevsky, heavy emphasis was placed upon strict, centralized control. This view reflected Imperial Russian and French doctrine. It also drew from the realities of the Russian Civil War, where the dual command system and the lack of training prevented junior officers from assuming initiative. In 1924, shortly before his first tour of Germany, Tukhachevsky would write that “The intelligent leadership of troops, and the ability to appreciate and

²⁶⁵ Up to 1931, Triandafillov was a more prolific theoretical writer than Tukhachevsky, synthesizing and organizing his friend and boss’s strategic thought into coherent operational doctrine. Triandafillov was an Imperial Army Captain commissioned during the war who became chief of staff for military operations in the Red Army in 1923. Tukhachevsky wrote a number of journal articles and several longer monographs between 1924 to 1936, but the only drafts of his longest theoretical work, *New Problems of War*, were destroyed after his execution in 1937. His strategic thought is perhaps best illustrated by his editorship of two major military manuals (PU-29 and PU-36) and a number of articles defending them. It was the works of his partner and friend Triandafillov – *The Scale of Operations in Modern Armies* (1926) and his seminal book *The Character of Operations in Modern Armies* (1929) – which best systematized Tukhachevsky’s thoughts on doctrine. Triandafillov was working on a second edition of the latter work when he was killed in a plane crash in 1931. Harrison, p. 202.

²⁶⁶ Richard W. Harrison, *Architect of Soviet Victory in World War II: The Life and Theories of G.S. Isserson* (Jefferson, NC: McFarland Publishing, 2010), p. 10. Much of this German literacy came from Isserson’s upbringing. The fact that he considered German one of his two native languages from his upbringing in the Baltic States had a major impact on the sources he read and the development of his own theoretical thinking.

²⁶⁷ Harrison, *Architect of Soviet Victory*, p. 36.

²⁶⁸ *Ibid*, pp. 43-44.

predict the way operations develop call for firm and precise direction of forces. Any suggestion of the exercise of independent command by junior commanders is unacceptable.”²⁶⁹ Yet after seven years of working alongside the Germans, Tukhachevsky concluded that

Small units cannot afford to ‘wait for orders’; nor do they have the right to do so. They must act boldly and decisively on their own initiative. It is in reliance on this spirit of initiative and acting without orders that the commander planning the battle issues his orders and directs the action.²⁷⁰

This remarkable about-face on one of the central tenets of warfare shifted Soviet doctrine firmly towards the German concept of *Auftragstaktik*.²⁷¹ It would become a major component of Deep Battle, the central operational concept of the Red Army from 1929 onwards. The Soviets thus borrowed German vocabulary in forming their operational doctrine, though much else was original or derived from their own experiences in the Civil War. By 1936, both militaries possessed operational doctrines emphasizing the offensive, the decisive role of technology, the importance of mobility, officer initiative, and combined arms.²⁷²

Cooperation with Germany provided a place to test these doctrinal developments with experienced troops and new technologies of war. Large scale maneuvers of Soviet

²⁶⁹ Tukhachevsky, “Questions of Higher Command,” in Simpkin, p. 97.

²⁷⁰ Tukhachevsky, “New Questions of War,” in Simpkin, pp. 149-150.

²⁷¹ *Auftragstaktik* is the concept of mission-tactics, that is, assigning a mission to subordinates rather than a directed course of action, thus leaving considerable initiative in the hands of subordinates. Tukhachevsky’s words here would be echoed by the 1933 German Manual *Truppenführung*: “The mission and the situation lead to the decision of the course of action.... The commander must allow his subordinates freedom of action.” Condell, Zabecki, p. 23.

²⁷² For the Soviets, the net result of the import of doctrine and training from debates was a synthesis of the ideas of the major theorists: Frunze, Svechin, Triandafillov and Tukhachevsky in particular. In retrospect, it seems that Svechin had correctly identified the logical course of Soviet strategy: attritional warfare would be the inevitable result of a modern warfare between the Soviet Union and a more technologically advanced neighbor to the West.

formations had failed to vindicate Deep Battle in the early 1930s, in part because of a lack of training among their officers. As a result, General Tukhachevsky would ask his German counterpart for “cooperation of aviation with infantry, and in particular with mechanized forces and cavalry in battle.”²⁷³ The grand combined arms maneuver hoped for by Tukhachevsky never materialized, but the Soviets did have an opportunity to test aerial combat formations, the interplay between tanks and infantry, chemical weapons deployment and countless other concepts with small formations of top Soviet and German officers. These small-scale demonstrations helped the core of officers around Tukhachevsky write the tactical supplements to the idea of Deep Battle that dominated Soviet doctrine until 1937. It is no wonder they spent so much time at the facilities and in Germany in the critical years between 1929 and 1933.

The same selective exchange also reshaped Soviet military education and training. One element of this is, of course, the great number of Russian officers who studied alongside their German peers at Kama, Lipetsk, Podosinki and Tomka.²⁷⁴ But perhaps the clearest sign of German influence on training to the Red Army was the number of Red Army officers who traveled to Germany for extended studies. In 1925, 12 Soviet officers visited Germany, including Mikhail Tukhachevsky, Romuald Muklevich (head of the Soviet Air Force) and several corps and division commanders. In 1926, another twelve officers visited, two of whom stayed for officer training courses. In 1927, the number

²⁷³ “Notizen aus dem Protokoll der Besprechung vom 22.11.31 zwischen Alksnis, Feodorof, Hoffmeister und Niedermeyer [Notes from the Transcript of the Conversation on November 22, 1931 between Alksnis, Feodorof, Hoffmeister and Niedermeyer],” November 22, 1931, p. 14.

²⁷⁴ Their numbers, where known, have been noted throughout this dissertation. It can be said with certainty that more Soviet officers than German ones studied at the joint facilities.

grew to fourteen, with three officers taking courses. Among those three were the head of the Frunze Military Academy and one of his senior faculty members. By 1931 – the apogee of cooperation – fifty-one Soviet officers visited, worked or studied in Reichswehr facilities. Twenty-three of them stayed for at least a month to take part in officer training courses.

The constitution of these study groups suggests how important the German relationship was to the crafting of Soviet training and technical education. While most of the German officers who went to study in the Soviet Union were young junior officers, most of the Soviet officers studying in Germany were division commanders or above. They were accompanied by large delegations from the major Soviet military education institutions: the heads of the central training facilities for chemical warfare, the Soviet Navy, the Red Air Force, the Artillery Directorate and the General Staff and the Frunze Military Academy all visited Germany between 1927 and 1933.²⁷⁵

²⁷⁵ “Dubinin to Khmel'nitsky, Komandirovkii v Germanii, s 1924 do 1936 g. [Business trips to Germany from 1924 to 1936],” pp. 1-26.

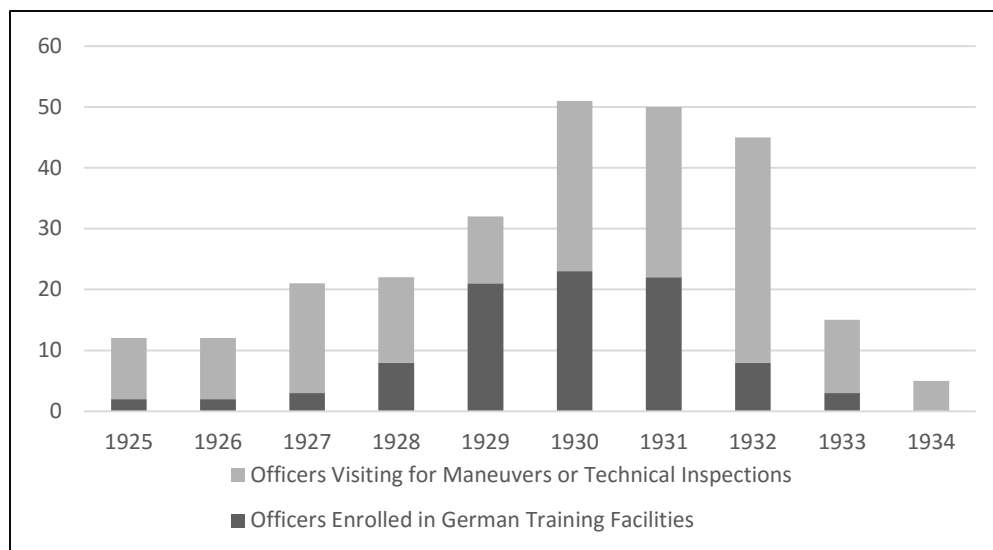


Table 4 Soviet Officers in Germany, 1925-1934

In 1931 alone, the head of military education in the Red Army, the chief of General Staff training, the commander of artillery officer training, the head of military cartography education, and lecturers on motorization, technical education, cartography and aviation all studied in Germany.²⁷⁶ These visits were not aimed at cadre development. Instead, the objective was to fundamentally reshape Soviet military education and training procedures based upon the German model. A Russian general in 1930 described the role of German instructors in Soviet education:

The technical side of the army is well organized. There are a lot of schools, and courses of instruction, in which the Red Commanders are being coached. The Germans play a great role with us. It is difficult to say where our staff begins and the German staff ends....Since the civil war we have had a proper military

²⁷⁶ “Dubinin to Khmel'nitsky, Komandirovkii v Germanii, s 1924 do 1936 g. [Business trips to Germany from 1924 to 1936],” pp. 1-26; Zeidler, pp. 357-359.

training and have become quite good military specialists. Our military academicians are better educated than was the case before the war.²⁷⁷

The reshaping of curricula at the major academies and the training of instructors had an inestimable impact on the Red Army, assisting in the development of a new, Bolshevik military class.

Whereas the German alumni of the cooperative facilities played central roles in the Second World War, most of the officers who served alongside the Germans disappeared in the Great Purge between 1936 and 1938.²⁷⁸ In total, the purge claimed

3 out of 5 Marshals, 13 out of 15 Army Commanders, 8 out of 9 Fleet Admirals and Admirals Grade I, 50 of the 57 Corps Commanders, 154 of the 186 Divisional Commanders, 16 of the 16 Army Commissars, 25 of the 28 Corps Commissars, 58 of the 64 Divisional Commissars,” and an additional 43,000 military officers were arrested or dismissed.²⁷⁹

Amazingly, by 1938, there was not a single graduate of the Frunze Academy serving as a regimental commander in the Red Army.²⁸⁰

In 1930, *The Morning Post*, a British newspaper, published an interview with an anonymous Soviet general entitled “Why We All Hate the Party.”²⁸¹ The German Foreign Ministry, for one, treated the interview as authentic, preserving it with a worried note

²⁷⁷ “Artikel der “Morning Post” über Verhältnisse in der russischen Armee, insbesondere auch den deutschen Einfluss daselbst [Article in the ‘Morning Post’ about conditions in the Russian Army, especially discussing German influence],” R31496 K/K098008, PA-AA, p. 1.

²⁷⁸ The best studies of the military purges to date are Robert Conquest, *The Great Terror: A Reassessment* (Oxford: Oxford University Press, 1990) and J. Arch Getty and Oleg Naumov, *The Road to Terror: Stalin and the Self-Destruction of the Bolsheviks, 1932-1939*, (New Haven: Yale University Press, 1999).

²⁷⁹ Conquest, p. 450.

²⁸⁰ Ibid, p. 450.

²⁸¹ “Artikel der “Morning Post” über Verhältnisse in der russischen Armee, insbesondere auch den deutschen Einfluss daselbst [Article in the ‘Morning Post’ about conditions in the Russian Army, especially discussing German influence],” p. 1.

about its details on German activities in Russia.²⁸² The disgruntled Soviet officer, who introduced himself as a Communist Party member since 1918, stated that the Red Army was on the verge of revolt: “The rank and file of the Red Army soldiers are the most counter-revolutionary element in the army. Among them peasants predominate.”²⁸³ They had been turned against the state by the process of collectivization: “Our former division into kulaks, poor peasants and middle-class peasants has lost its meaning. They are all poor now. The Government has ruined them all, and they are all dissatisfied.”²⁸⁴ In conclusion, the anonymous officer noted, “All look to war as a way out, the Red Army soldiers as a means of getting rid of the communist Government... if we could only get rid of Stalin, then you would see the beginning. And in that case, the army would have something to say.”²⁸⁵ If the German government took the interview seriously, the reaction in Moscow must have been much more severe. Rumors circulating in foreign papers that Tukhachevsky aimed to create a Red Army “above the party,” or even worse, ally with the Reichswehr to destroy the Communist Party certainly could not have helped improve Stalin’s attitude.²⁸⁶

Stalin must have considered the German role in educating and training officers as military professionals as particularly dangerous. A memorandum in the Russian Archives

²⁸² It certainly reads as authentic; the author’s limited details about German cooperation, his sentiments on collectivization, and discussion of the demographics of the Red Army all suggest honesty.

²⁸³ “Artikel der ‘Morning Post’ über Verhältnisse in der russischen Armee, insbesondere auch den deutschen Einfluss daselbst [Article in the ‘Morning Post’ about conditions in the Russian Army, especially discussing German influence],” p. 1.

²⁸⁴ Ibid.

²⁸⁵ Ibid.

²⁸⁶ Balticus, “The Russian Mystery: Behind the Tukhachevsky Plot,” *Foreign Affairs*, October 1937, <https://www.foreignaffairs.com/articles/russian-federation/1937-10-01/russian-mystery>

shows that Voroshilov ordered the Red Army to produce lists of all officers who had visited or studied in Germany while the purges were ongoing.²⁸⁷ But despite the horrors of the Great Purge, not all those senior officers who had studied in Germany disappeared. For instance, Future Field Marshal Kirill Meretskov spent three months with the Truppenamt in 1931. He was arrested, held by the NKVD for two months, then released in 1941. He would rise to command the Karelian Front in 1944 and of the Soviet invasion of Japanese Manchuria in 1945.²⁸⁸ Some others were protected by their political prominence. Future Field Marshal Semyon Timoshenko spent a month visiting German military installations in 1931, but his close personal relationship to Stalin saved him from the purges.

Between 1924 and 1937, the Red Army trained tens of thousands of officers. It had enormous numbers of tanks, planes and other advanced technologies of war. It possessed a firm military-industrial base. The Soviet Union had taken major steps to remedy its perceived weaknesses. In terms of doctrine, Tukhachevsky and Triandafillov had recognized the fundamental changes in the nature of warfare, namely, that new technologies had restored mobility to the offensive. Unfortunately, the Great Purge “accentuated an already existing truth in Soviet (and perhaps Russian) development – the tendency for practice and reality to lag significantly, often disastrously, behind theory.”²⁸⁹ The capability of the new generation of Soviet officers to carry out deep battle was

²⁸⁷ “Dubinin to Khmel'nitsky, Komandirovkii v Germanii, s 1924 do 1936 g. [Business trips to Germany from 1924 to 1936],” pp. 1-26; Zeidler, pp. 355-360.

²⁸⁸ See Kirill Meretskov, *Na Sluzhbe Narodu [In the Service of the People]* (Moscow: Politizdat, 1968). Available through *Voennaya Literatura Digital Library*.

²⁸⁹ Glantz, “Introduction,” p. 3.

uncertain, and the Great Purge clouds precisely how effective Tukhachevsky's Red Army was.²⁹⁰ So too does the nature of the surprise attack launched by the German Army.²⁹¹ Despite the "institutional surprise" revealed by Operation Barbarossa, the Red Army possessed essential strengths that the Tsarist Army in 1914 did not. Cooperation with Germany played an essential role in that process. Ultimately, the depth of the Soviet officer corps and the strength of Soviet military industry would halt the tide of the German advance at the gates of Moscow, and eventually reverse it. Both can be credited, in part, to the pact with Germany.

FORESHADOWING THE WAR

Rarely have two armies of such disparate compositions and origins been thrust up in such close proximity to each other as the Reichswehr and Red Army were from 1922 to 1933. Their views of each other, provided in intelligence assessment and the weekly reports from the secret facilities, provide an unprecedented look at the culture of each. By 1930, Soviet military intelligence had a clear presentiment of an impending political crisis within the German army. Intelligence agents at Lipetsk noted that older officers, like Walter Stahr and Max Mohr were likely to be "a follower of Hindenburg" or a

²⁹⁰ It is clear that the building of thousands of rapidly obsolete vehicles, like the T-26, handicapped, rather than aided, Soviet defensive measures.

²⁹¹ The "institutional surprise," as David Glantz calls it, might not have occurred without the Great Purges. During a war game in 1936, Tukhachevsky was commanding the fictional German Army. He launched a surprise attack across a broad front to initiate the war, but the war game's umpires refused to allow the action to be carried out, as it would have embarrassed the players on the side of the Red Army. Richard Harrison, p. 185.

“democratically-inclined.”²⁹² But younger officers were more likely to be ardent Nazis. The political data on the officers present suggested that officers born before 1896 were less likely to be of Fascist orientation, while those born after 1898 were much more likely to have evinced support for Hitler.²⁹³ The reason, not enunciated in the Lipetsk reports, might lie in the fact that many of the officers born before that date had some military experience predating the First World War. Coming of age in the prewar monarchist German Army was very different than doing so in the trenches of the First World War. Those who had joined the army during the war were much more likely to have served in *Stosstruppen* and latter, *Freikorps*. They tended towards racial nationalism.

These Soviet observations were astute. It was around 1929 that the Reichswehr began to “politicize” more radically, in violation of Seeckt’s dictum that only the head of the Reichswehr should participate in politics. The growing crisis in Germany played a central part. From the 1930 Reichstag election onwards, a series of minority governments were able to govern only through the extensive use of Article 48, the constitution’s emergency provision. This meant the end of parliamentary rule. Around the same time, the Truppenamt began offering “bounties” for soldiers who turned in other soldiers spreading communist propaganda.²⁹⁴ But the real danger was from political organizations of the far-right. This became obvious for the first time in 1929, when two lieutenants

²⁹² Soviet agents tended to identify “Hindenburg followers” as “Fascists,” but not “Strong Fascists,” which was something of a generalization. The distinction between conservative nationalists and racial nationalists was somewhat stronger than they understood. “O buivshem 4-m Nemetskom Aviaotriade, Lipetskoi Gorodskii Otdel MGB Voronezhskoi Oblasti [Report on the former 4th German Squadron, Lipetsk City Department of the MGB in the Voronezh Region,” Compiled on January 18, 1950, p. 3.

²⁹³ Ibid, pp. 1-17.

²⁹⁴ Carsten, p. 309.

were put on trial. They had joined the Nazi Party in violation of the Reichswehr's rules against political memberships. It quickly became clear to the senior leadership that the vast majority of the army favored the Nazi officers' immediate acquittal as their popularity plummeted.²⁹⁵

Schleicher, in the *Ministeramt*, received a series of letters highlighting the dangerous growth of radical sentiments. One veteran wrote to him that "younger officers who had still greater ideals than the mere struggle for existence... are not pro-Nazi because of the Nazi programme, but because they believe they discover there a force which fights the decline of the Reich, which does what they perhaps expect from the Reichswehr."²⁹⁶ Another wrote that

In spite of all his insouciance, the pre-war lieutenant was much more cautious in difficult questions. Certainly, the turbulence of our time must be taken into account when we look at our new generation, but precisely those with intellectual interests are the most prominent in their sharp criticisms... we have here [in the next generation of junior officers] a fanatical defender of Nazi sentiments with whom it is hardly possible to argue.²⁹⁷

A third officer estimated that 90 percent of the officer corps favored the National Socialists.²⁹⁸ By 1930, the entire Navy had been drawn into the Nazi orbit, and even its arch-monarchist leader Raeder was becoming increasingly sympathetic to Hitler.²⁹⁹ The Reichswehr's leadership was losing the battle for the officer corps.

As this schism opened up between the army's senior leadership and the rest of the officer corps, the latter became increasingly politically active, rupturing the carefully

²⁹⁵ Carsten, p. 317.

²⁹⁶ Ibid, p. 312

²⁹⁷ Ibid, pp. 312-313.

²⁹⁸ Ibid, p. 320.

²⁹⁹ Bird, p. 85.

constructed internal discipline achieved by Seeckt. As Carsten noted, there was “no obedience without confidence, and confidence in Heye and Schleicher” was fading rapidly.³⁰⁰ Had the senior generals of the army – Groener, Heye, Schleicher, their two corps commanders, the four main section heads and the seven infantry division commanders – stood firmly together, perhaps the crisis could have been managed. It was not to be.

It was Werner von Blomberg, who, having become enamored with autocracy during his time in Russia, would volunteer to be Hitler’s man in the Reichswehr. In the words of Wilhelm Deist, “the Hitler-Blomberg ‘alliance’ marked the decisive turning point for the Reichswehr.”³⁰¹ The army would begin a rapid transformation immediately thereafter. Blomberg managed a purge of the officer corps, removing those officers who had supported Schleicher or could pose a threat. On March 1, 1933, the Army was legally subordinated to the Nazis. More importantly, beginning nineteen months later, all officers were forced to take an personal oath of loyalty to Hitler. At the same time, the Reichswehr also began to openly develop new technologies within Germany that had been banned under the Treaty of Versailles. On March 16, 1935, Hitler announced universal conscription, officially abrogating the Treaty’s provisions about defense. The last thread of restraint was gone. With it, the era of the Reichswehr would end, as it was renamed would be renamed the *Wehrmacht* [Defense Force] on the same date.

³⁰⁰ Bird, p. 322.

³⁰¹ Deist, p. 20.

But rearmament and the politicization of the Reichswehr had failed to remedy Germany's greatest weakness: strategy. Cooperation made this abundantly clear. The Soviets complained again and again that the German Army, Navy, Foreign Ministry and civilian leadership did not talk to each other and were all pursuing contradictory goals. In fact, the highpoint of German civil-military relations under Groener was forced upon the German Army by Soviet demands that the German government be informed of their activities after the Junkers Scandal in December 1926. But after Seeckt's fall from power, the multiplicity of strategic visions in Germany remained. The German Navy prepared for a war first with the Soviet Union and then against the Western Powers, while the Army planned for a war first with Poland, then with France. This was perhaps the clearest harbinger of German defeat in the Second World War: the lack of a coherent grand strategy that could take German technical, tactical and industrial advantages and deploy them towards the same end.³⁰²

The weaknesses of the Red Army in terms of training, organization, and leadership were all chronicled by German intelligence reports. It must be said that some of these had been remedied by 1937. But in many ways, the purges returned the Red Army's officer corps back to the parlous state the Germans had commented upon in 1926. Officers did not know how to write orders, were not familiar with basic tactical manuals and had little experience. Even before the purges, the Red Army had struggled to

³⁰² There was a technological angle to this grand strategic muddle. The German Navy was in the early phases of its rebuilding campaign when the Second World War broke out, while the army was just beginning to mass produce its medium tanks and the air force had not yet devised a long-range bomber as planned according to their 1936 long-term program. The conflicting visions of the next war embedded in each services' research and development programs spelled disaster.

put Deep Battle into effect. Tukhachevsky's fall from grace was precipitated in part by the repeated inabilities of the Red Army to perform its operational doctrine successfully in maneuvers between 1931 and 1936, particularly the massive armored warfare maneuvers in 1935.³⁰³ Given more time, and the improving educational levels of Soviet officers, perhaps that would have changed by the beginning of the war. But the decapitation of the Soviet officer corps eliminated exactly the spirit of initiative required in the officer corps to make Deep Battle practicable. And the doctrine itself was discarded after Tukhachevsky's execution, only to be revived in 1942. One wonders how German officers received the news that those Soviet officers they had trained with had been murdered by their own government. Did it affect their attitudes towards the Soviet Union during the war? Certainly it could not have come as a complete surprise.

THE FAUSTIAN PACT

In the climactic scene of Part II of Goethe's *Faust*, the eponymous character finds himself commanding the armies of the Holy Roman Empire. With the aid of Mephistopheles at his side, he leads Germany's army to a heroic triumph. Soon, enjoying power, wealth and might, Faust finds that he has reached the moment of euphoria that the Devil had promised him in exchange for his soul. In that moment, he is taken suddenly by death.

The Soviet-German alliance met, though not in exactly the way either side had foreseen, the objectives of the Reichswehr and the Red Army. By 1933, their militaries

³⁰³ Harrison, p. 216.

had some of the world's most advanced technologies of war, a strong cadre of experienced officers, and coherent military doctrine to put them both to use. Further, both Germany and the Soviet Union used their unlikely partnership to secure diplomatic leverage in negotiations with Great Britain and France, muddying the diplomatic waters and hindering the maintenance of Europe's status quo.

Mephistopheles demanded Faust's soul in exchange for military power and forbidden knowledge. The costs of the Soviet-German partnership were also high: their work together undermined the stability of both regimes, playing a part in the collapse of pluralistic state institutions. In Germany, the new civilian leadership of the Weimar Republic never successfully brought the military under its control. The remnants of the German High Command used this autonomy to prepare for what they saw as an inevitable second phase of the Great War that would revise its unfair peace terms. The process of rearming and training, coupled with the self-selection of officers from the Freikorps, further alienated the Reichswehr from the state. By 1933, political and economic circumstances had created an army that actively sought the destruction of its own state. And the secret process of rearmament had coopted German industrialists. Both the German officer corps and German business leaders of Germany would see Hitler as the inevitable next step in a long-planned restoration of German military might.

The early Soviet state could hardly be called a democracy. But the concept of "party democracy" survived into the late 1920s, when it was extinguished by the rise of Josef Stalin. One of his weapons was the Red Army. He drove Trotsky from power over the question of his management of the Soviet military, then used the "war scare" of 1927

in his efforts to eliminate the remaining leftist opposition. In 1928, it was the turn of the rightist opposition as Stalin launched the First Five Year Plan. This project greatly favored military development. It required enormous amounts of technical and military assistance, much of it provided by German businesses through the intercession of the German Army. Stalin's collectivization drive also required the loyalty of the army, an issue of critical concern given its demographic constitution. While some dissented in silence, the majority – professionalized with German assistance – backed the efforts of the state.

In Goethe's *Faust*, the hero's soul is saved at the last moment by the intercession of angels and the Virgin Mary. In older, darker versions of the tale, the Devil dragged Dr. Faustus to hell as the price of his ambitions. In both the Reichswehr and Red Army, rearmament was driven by explicitly expansionist visions of revising the global order. Arrangements with the hated ideological enemy aimed at developing weapons for offensive war. The same process tore down the barriers maintaining peace. Rearmament would play a critical role in the militarization of each society, and eventually, the destruction of dissenting groups in each regime. The logic of the Soviet-German strategic partnership would lead to a war between its members.

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