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## A Reciprocal Reaction: The USSR Chemical Weapons Program and Its Influence on Soviet Society through Three Civilian Groups

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**A Reciprocal Reaction:**

**The USSR Chemical Weapons Program and Its Influence on Soviet  
Society through Three Civilian Groups**

Yun Zhang

Honor Thesis in History

May 2019

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## **Introduction**

On September 27, 2017, Russian President Vladimir Putin announced the destruction of Russia's last chemical weapons storage facility in the Udmurtia Region, hundreds of miles east of Moscow. At the press conference, Putin declared the complete destruction a "historic event given the huge size of chemical weapons arsenals left to us since Soviet times, which specialists believed could have destroyed every living thing on Earth several times over."<sup>1</sup> The complete destruction of Russian chemical weapons stockpile marked a milestone in both Russian history and the global disarmament and nonproliferation program. From one of the first victims of chemical weapons during World War I to the nation that possessed the largest stockpile in the world, to a responsible, chemical weapons-free country, Russia over the last century transformed in a way unlike any other nation in terms of becoming a scientific power, yet also a scientific outlaw.

From Mendeleev to Semyonov, from the periodic table to chain reaction mechanism, Russian chemists made distinguished contributions to the field. Although not as renowned or prosperous as the Russian physics, astronomy, or mathematics communities therefore easily overlooked, the Russian chemistry circle posed strong influence on the political, economic and scientific trajectory of the Soviet Union. Chemical industries spanned into all sections of the society: agriculture, mining, metallurgy, light industries, medicine, and most importantly, national defense and military – chemical weapons.

Chemical weapons (CW), along with biological, radiological, and nuclear weapons, were weapons of mass destructions (WMD), a dreadful development that dramatically yet subtly

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<sup>1</sup> Russian News Agency TASS, "Destruction of Chemical Weapons in the Russian Federation" [Уничтожение химического оружия в РФ]. URL: <https://tass.ru/info/4333286>, Accessed January 19, 2018.

shaped the world since the dawn of the twentieth century. Since its debut in the First World War, chemical weapons ranging from chlorine, Lewisite, Mustard, to Nerve Agents like Sarin, VX, and Novichok have claimed thousands of lives. In WWI alone, official records reported 1.3 million casualties directly caused by weaponized chemical agents, among them 100,000-260,000 civilians.<sup>2</sup> However, chemical weapons also scarred societies and civilians in indirect, less-noticeable ways where statistics and figures failed to cover, especially in countries who had a larger CW program like the USSR.

In the short history of chemical weaponry, the USSR was one of the most influential players. It encountered the Germans' first attempt to introduce chemical weapons in the Battle of Bolimov, Russia on February 1915.<sup>3</sup> Later, the Germans' successful deployment of chlorine gas at the second battle at Ypres forced Russia to develop chemical warfare countermeasures and means of retaliation, one of the first powers to undertake such actions.<sup>4</sup> On its own, researches on poisonous and weaponizable chemicals began in the late tsarist era. Since the Russian Civil War, by tactfully veiling the secret CW programs while steadily progressing in research and production, the USSR utilized its CW capability both psychologically and physically to help achieve political pursuits such as securing domestic dominance, assassinating rival political figures, and establishing international deterrence. Disregarding the 1925 Geneva Protocol, the Soviet Union successfully scaled up the research and production of chemical weapons in deepest secrecy, only disclosing its chemical weapon stockpile data in 1991.<sup>5,6</sup> By the time the USSR

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<sup>2</sup> Max Boot, *War Made New: Weapons, Warriors, and the Making of the Modern World*. (New York: Gotham, 2007), pp. 245–250. ISBN 1-5924-0315-8.

<sup>3</sup> Thomas S. Bundt, "Gas, Mud, and Blood at Ypres: The Painful Lessons of Chemical Warfare," *Military Review*, July-August 2004, p. 81.

<sup>4</sup> Gerald J. Fitzgerald, "Chemical Warfare and Medical Response During World War I," *American Journal of Public Health*, April 2008, Vol 98, No. 4, p. 615.

<sup>5</sup> B. V. Sennikov, *The Tambov Uprising of 1918-1921. and the spreading of Russia in 1929-*

collapsed and Russia ratified the Chemical Weapons Convention (CWC) in 1997, it declared the largest stockpile in the world of an astonishing 40,000 tons of chemical weapons.<sup>7</sup>

The USSR CW stockpile's most pronounced impacts were its direct, physical damage on the battlefields and deterrence in the international politics arena. Domestically, however, the USSR's chemical industry also tightly intertwined with its social, economic, and cultural environments, influenced and was influenced by the USSR civilians and society. In one direction pointing from the society to the CW program, the size of the CW program demanded that ordinary workers and researchers in the field of civil-purposed chemistry joining the crew. The secrecy and importance of the program attracted significant political supervision and intervention. The USSR's urgent need to industrialize itself offered the chemical industry huge resources for development. In the reverse direction, the civilians brought in thoughts unorthodox to the ruling class' vision into the programs. Political redundancies fractionalized the working force and created fertile ground for corruption within the programs. Industrialization only resulted in the hastily-built, hazardous infrastructures which generated further discontent among the workers and ethical problems that ultimately contributed to the collapse of both the program and the regime. Both directions will be further discussed to render a better-rounded analysis of the USSR's chemical weapons industry's historic role. While the primary purpose of developing a chemical industry for war, similar to that of other countries, was to deter and defend against the invading armies, the USSR's programs also hit its own citizens in unique ways and worth investigating.

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1933. (Moscow: Posev, 2004).

<sup>6</sup> *Chemical Weapons in Russia: History, Ecology, Politics*. [Khimicheskoye Oruzhiye V Rossii: Istoriya, Ekologiya, Politika ] by Doctor of Chemical Sciences Lev Aleksandrovich Fedorov Moscow; Center of Ecological Policy of Russia, 1994 [27 July 1994]

<sup>7</sup> E. J. Hogendoorn (1997) "A Chemical Weapons Atlas," *Bulletin of the Atomic Scientists*, 53:5, 35-39, DOI: 10.1080/00963402.1997.11456768

This paper looks to collect and recover a picture of the USSR's CW program from the perspective of Soviet civilians. From dawn to dusk of the Soviet Empire, this program generated shared and contrasting sentiments among the Soviet people, and profoundly shaped the Soviet mindset and social atmosphere among three groups of people connected with it. The first group represents the direct victims of chemical weapons among the Russian population, such as the civilians suspected of aiding the White Army during the Russian Civil War at the village of Kipets. It also includes individuals who threatened the Bolsheviks' rule, including General Aleksandr Kutepov and Yevgenii Miller, heads of the White Russian Military Union (ROVS) in Paris, Abram Aronovich Slutsky, head of the Soviet foreign intelligence service (INO) until his death in 1938, and Georgi Markov, a dissident Bulgarian writer. Letters, diaries, memoirs of the victims and their dear ones delineated the profound trauma left by their assassinations by poison. The second group includes precisely the promoters of CW, the scientists leading the research on poisonous compounds and the advocates for the stockpiling of chemical weapons like secret policy chief Lavrenty Beria and Grigory Mairanovsky, the head and leading researchers in the infamous Laboratory X, whose transcripts and letters were published by military prosecutor Vladimir Bobryonev and journalist Valery Ryazentsev in the book *Doktor Smert*. The third group consisted of the people in between – chemistry students, workers, and others who worked in the industry just to make a living yet suffered from the experience both mentally and physically, with Vil S. Mirzayanov as an example, a specialist who was assigned to work in the CW program after graduation from the Institute of Petrochemical Synthesis at the USSR Academy of Science and recollected his experience in the autobiography, *State Secrets*.

The activities, thoughts, and concerns of these three groups of Soviet citizens reflect the profound influence of the CW industry on society. The production and application of such



weapons not only granted the government a tool to suppress its dissidents by force and to rule using terror, but also led to the civilians' questioning of the moral and ethical values of the society. The rise of the USSR CW program both reinforced and sabotaged the Soviet regime. As a signature of the culminating authoritarian values upholding the regime's military force, the CW program also revealed the moral and ethical concerns for people of the USSR and the world, a perspective deserving more attention and investigation. We will see that the three groups at three ends of the CW program incurred agony on each other in a closed-ring fashion, yet the true culprit was the strayed Soviet politics and doctrines presiding above head.

## A Brief Overview of the USSR Chemical Weapons Program

While Russia was among some of the earliest and top-level countries in theoretical chemistry, its weak industrial basis limited the development of martial chemical technology in the face of chemical warfare in the early twentieth century. During WWI, Russian-produced chemical agents accounted for only 2.4% (3,650 of 150,000 tons) of the aggregate amount produced by all combatants and 4.2% of the total number of chemical weapons used in the war.<sup>8</sup> The military disadvantage in WWI left a deep impression on the Soviet leaders. In 1917, Russian generals concluded that chemical weapons were "an extremely powerful and beastly weapon," and that "their own technical inferiority had placed them at a terrible disadvantage."<sup>9</sup>

Ironically, the systematic initiation of the USSR CW program took place after the 1925 Geneva Protocol, setting the program's illegitimacy from the beginning. The 1925 Geneva Conference fruited the "Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare,"<sup>10</sup> on 5 April 1928. The protocol prohibited the use of "asphyxiating, poisonous or other gases, and of all analogous liquids, materials or devices", essentially all available chemical weapons in the early twentieth century, in war. Although the USSR ratified the protocol in 1928, the document's vague language left room for alternative interpretations and enforced no real limitation on the USSR and other nations' research, stockpiling, and non-war application of chemical weapons. Only in the *United Nations General Assembly Resolution 57/62* in 2002, did state parties to the 1925

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<sup>8</sup> Victoria Utgoff, *The Challenge of Chemical Weapons: An American Perspective*, (New York: St. Martins Press, 1990) p. 42.

<sup>9</sup> Joachim Krause and Charles K. Mallory, *Chemical Weapons in Soviet Military Doctrine: Military and Historical Experience, 1915-1991*, (Boulder: Westview Press, 1992) p. 20.

<sup>10</sup> "Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare" by League of Nations, archived by the United Nations Office for Disarmament Affairs, <https://www.un.org/disarmament/wmd/bio/1925-geneva-protocol/>, accessed 02/14/2019.

Geneva Protocol clarify and make absolute the prohibition of the “development, production, stockpiling and use of chemical weapons”.<sup>11</sup>

In 1928, Joseph Stalin, General Secretary of the Central Committee of the Communist Party of the Soviet Union and the leader of the Soviet Union, created the Military Chemical Administration (VOKhIMU) of the RKKA [Workers' and Peasants' Red Army, or Red Army] to oversee the CW program. Also, the First 5 Year Plan (1928-1932) underscored the priority to rebuild Russia's industrial capabilities.<sup>12</sup> Heavy investment in the Soviet chemical industry led the Soviet Union's chemical production to increase rapidly, from 5% of global production in 1929 to 18.5% in 1936.<sup>13</sup> Despite this funding, progress in constructing the USSR's chemical industry infrastructure occurred slowly with poor quality, with 66.1% of the production at new factories of poor and unusable quality.<sup>14</sup> Between the impressive progress in production and the impressive failure to build the matching facilities, manpower, consisted of the Soviet civilians, mitigated the discrepancy at a cost detrimental to not only the CW programs, but also the USSR people and the regime itself, as will be discussed in the following chapters.

Into later years of the USSR, the CW program's research focus increasingly shifted from practical military intentions towards unnecessarily lethal and inhumane chemical agents and armaments. The avid proponents of the CW program also began to use their research breakthroughs as tickets into the upper-circle of the Party instead of good for the country. The program astray questioned the rest of the scientists' moral and ethical beliefs, and many chose to

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<sup>11</sup> “57/62. Measures to uphold the authority of the 1925 Geneva Protocol,” Report of the First Committee (A/57/510), Fifty-seventh session of the General Assembly of the United Nations, December 30, 2002. <https://undocs.org/A/RES/57/62>, accessed 02/08/2019.

<sup>12</sup> Joachim Krause and Charles K. Mallory, *Chemical Weapons in Soviet Military Doctrine: Military and Historical Experience, 1915-1991*, (Boulder: Westview Press, 1992) p. 4.

<sup>13</sup> Victoria Utgoff, *The Challenge of Chemical Weapons: An American Perspective*, (New York: St. Martin's Press, 1990) p. 42.

<sup>14</sup> “Capital Industrial Construction in 1928/29”, *Известия [Izvestia]*, January 15, 1930.

break away from the wrongful purpose and the regime to prevent further mistakes from been added to the record of atrocities built since 1921, in Tambov.

## **The Civil War and Tambov Insurgence: Where it all began**

Immediately following their debut in the First World War, chemical weapons from both the Tsarist army's reserve and foreign aid were used in the Russian Civil War. The period saw the introduction of weaponized chemical agents and their first large-scale domestic applications. Despite the novelty and scarcity of chemical weapons in Russia, their use led to civilian victims and marked a new era of rule of fear. The most well-known battle involving domestically deployed CW in this era was the way in which the Bolsheviks Army used chlorine shells against the peasant rebellions in the Tambov Region in 1921. The attack not only targeted the dissident guerilla soldiers, but also their families and sympathizers in the area, most of whom were also peasants struggling in poverty and famine. Such attacks sought to maximize the deterrence of fear in exerting dominance of the Soviet government over its subjects, and the impact of the rule of terror had since deeply rooted in the regime. The institutionalization of chemical terror in the Soviet Union involved two major processes: that of Russia involuntarily learning from the West, about both technology and ideology, and of it voluntarily developing its domestically-based military chemistry and practicing it on its people.

Western attitudes of endorsing unrestrained use of chemical weapons in World War I as a military instrument infiltrated both sides of the Russian Civil War. As former tsarist commanders turned to the Red, pro-Bolshevik, or the White, monarchist armies, they spread the first-hand experience of chemical weapons. Russian generals hesitated to use them intentionally against their own civilians on a large scale. The White Army, with aid from the West, was the one initiating chemical attacks during the civil war. Equipped with abundant aerosols and experienced British officers, during the initial stage of the Bolsheviks Revolution, the White Army mounted several gas attacks targeting the Red Army. The diary of a British officer during

the Russian civil war offered a glimpse into the Russian's unfamiliarity and hesitation with deploying chemical weapons during the early stage of the civil war:

"In order to stop the Bolshevik offensive... I suggested using mustard gas with which special artillery shells are equipped. Many shells with this and other gases were unloaded at the stations, but so far for political reasons they have not been used... because the White Army personnel were very nervous at handling these shells... Gas was a terrible weapon, but it is constantly used in France since 1915 and is still regarded as a natural supplement to the war, and circumstances seemed to require it."<sup>15</sup>

The British official regarded chemical weapons as “natural supplement to the war”. With Western officers’ authority within the army, this kind of sentiments dominated the White Army in the early stage of the Russian Civil War.

The Western political and military officials generally believed that the use of chemical weapons on the battlefield was justified and necessary. Winston Churchill, in 1919, as Minister of Colonial Affairs, “expressed impatience with the reluctance of the Royal Air Force to drop bombs filled with mustard gas. ‘I do not understand this scrupulousness in connection with the use of gas,’ he wrote, ‘I firmly advocate the use of poison gas against uncivilized tribes.’”<sup>16</sup> Similarly, across the Atlantic, President of the American Chemistry Society and professor of organic chemistry at MIT, James F. Norris defended chemical weapons against “attacks leveled at it as an inhumane” before the Institute of Politics as late in 1926.<sup>17</sup> Such viewpoint relied on the Western powers’ understanding of the chemical weapons mainly as a territory-denial tool. By

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<sup>15</sup> H. Williamston, “Farewell to Don. Civil war in Russia in the diaries of a British officer 1919-1920”, Moscow, Tsentpoligraf, 2007, p155.

<sup>16</sup> Francis Gilles, “Overcoming Cultural Differences,” NATO Review, [www.nato.int](http://www.nato.int). Accessed 10/20/2018.

<sup>17</sup> Special to The New York Times. "GAS IS DEFENDED AS HUMANE IN WAR." *New York Times (1923-Current File)*, Aug 25, 1926. Accessed 01/22/2019.

strategically applying gases which deny infantries' entering certain areas, the army could avoid undesirable confrontations and save lives. As the Westerners brought in their chemical weaponry philosophy package, they also presented a widely-accepted checklist for initiating chemical attacks, which later went astray and caused unexpected backlash.

The decision-making of whether to initiate chemical attacks includes three questions: 1) whether the attack would lead to a significant military advantage; 2) whether the enemy would have the capability to retaliate in kind after the first wave of attack; 3) and the nature of political retaliation and any hostile international response are amenable to containment.<sup>18</sup> Assuming that these criteria remain constantly applicable to the Western powers and the White Army at the beginning stage of the Civil War, the situation met all three criteria and chemical attacks would be justifiable to achieve military victory. A comparison of the decision-making process between the British officer and the White soldier in the excerpt revealed the capitalist West's confidence in dodging the retaliation in kind by the Red Army. The confidence was well-founded, because the Red Army's only access to chemical weapons, except from capturing artilleries of the White, was the Tsar's stockpile.

Due to its weak industrial basis, the Tsarist Army, although had begun investing in converting and constructing chemical weapon production facilities immediately following the initial German attack in 1915, only had factories fully functional from late 1916. The Leningrad Physico-technical Institute, for example, achieved conditions of "normal for work" only by 1924. Even so, from 1916 to 1917, the imperial army produced about 1,820,000 gas shells, mainly

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<sup>18</sup> CIA, "Possible complications for the US national defense as a result of the use of the Soviet Union chemical and toxic weapons," *Foreign Policy*, Nov. 1983.

chlorine, a respiratory irritant whose potency falls far behind mustard gas.<sup>19</sup> The Red Army only acquired 8,000-13,000 pieces of small, crude weaponry, including chlorine-filled cylinders without detonating devices, almost exclusively from the tsarist army's stockpile.<sup>20</sup> Therefore, when targeting the Red Army that was nowhere near possessing the ability to retaliate, the British Army, along with its allies, gained decisive advantages through utilizing chemical weapons.

Beginning early 1919, the White Army received massive quantities of various chemicals from the British army during their offensive operations. In May 1919, to drive the Red Army out of their fortification in Kerch, Crimea, Colonel Konovalov deemed it "necessary to ask the British to deliver 50 thousand kilograms of asphyxiating gases," which came in 3 days later, and they showered the Red-occupied church square.<sup>21</sup> Archival records confirm that another large supply of mustard bombs arrived in Russia from Great Britain on the eve of the revolution, in Arkhangelsk on the White Sea. In the Caucasus war zone, the chemical bombs, "in addition to high-explosive aerosols, were dumped to the Position of the Red Army."<sup>22</sup> These assaults successfully drove the Red Army to the east and effectively mitigated the potential direct confrontation which could cause huge capital damage on both sides.

The initial artillery shortage for the Red Army impressed Bolshevik leaders of the significance of wartime industrial advantage, and this set the tone for the Soviet Union's focus

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<sup>19</sup> The history of the Organization of the Authorized Chief Artillery Directorate for the procurement of shells on the French model of Major General S.N.Vankova. - М.: Mnemosyne, 2006.

<sup>20</sup> RGVA. F.20. Op.11. D.140. L.120.

<sup>21</sup> "Struggle for Soviet Power in Crimea: Documents and Materials." Party Archive of the Crimean Regional Committee of the Communist Party of Ukraine, State. Archive of the Crimea region. T. II. - Simferopol: Krymizdat, 1961.

<sup>22</sup> М. Khayrulin, V. Kondratyev, "Военлеты погибшей империи. Авиация в гражданской войне", Moscow, Yauza, 2008, p. 139



on military research and development for the next seventy years. Having witnessed the power of chemical weapons and learned the Western ideology to justify the use of them, the Red Army, with a growing industrial base of CW production and pool of captive shells, began experimenting the weapons in situations where CW deployment was unnecessary – crushing the 1921 Tambov Rebellion.

Despite its initially meager reserve of chemical weaponry, the Red Army learned the power of chemical weapons in a hard way through its stacked number of casualties and gradually expanded its stockpile relying on the now fully-functioning factories and the discovery of new agents. During the closing stage of the Civil War, the Red Army also captured large quantities of chemical artillery from the White. For instance, the 6<sup>th</sup> Army 54<sup>th</sup> Infantry Division reported capturing “1072 artillery, 800 grenades, 108 chemical (weapons)” during “the liquidation of the Whites in the Pinezhsky region”.<sup>23</sup> These artilleries allowed the Red to commit their initial and experimental chemical attacks in 1921.

The first documented systematic use of chemical weapons by the Bolsheviks was during the Tambov rebellion in 1921, four years before the Geneva Protocol. The Bolsheviks understood that chemical weapons physically devastate the enemy, deny territory, and were psychologically agonizing by inflicting pain, death, and fear, and not on the combatants alone but on the collaborating civilians, supporters, sympathizers, and even the innocent. Tambov province sits on the confluence of the Tsna and Volga Rivers, then a cultural center and a major grain-growing region 300 miles southeast of Moscow. During the Civil War, Red and White Armies fought heavily in the region. At the height of the war in 1919, Lenin’s policy of *prodrazvyorstka*, or “foodstuff requisitioning”, legalized grain confiscations in large quantities,

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<sup>23</sup> Northern front. 1918-1920. Documents. M.: Voenizdat, 1961. p. 258.

led to rampant food seizures by both Red and White armies in the countryside, and triggered severe famine among civilians from many rural regions, including Tambov.<sup>24</sup> Peasant resistance against the Red Army's brutality escalated in 1920 into a regional revolt with Aleksandr Antonov as its leader and an estimated fifty thousand armed guerillas including many Red Army deserters.<sup>25</sup> As the Civil War was wrapping up in 1920, the Revolutionary Military Council (RVS) dispatched General Mikhail Tukhachevsky to suppress the rebellion.

With its main force defeated, the remnants of the second Rebel Army sought refuge in the Tambov forest. Upon Tukhachevsky's recognition that "swamped and forested terrain which shielded the guerillas was the main obstacle to victory," the RVS, on which Trotsky sat with Lenin as the supervisor, transferred gas shells to the Tambov region. On June 12, 1921, Tukhachevsky issued an order "to scour the forests where the gangsters are hiding, use poisonous gases to accurately clean up the cloud of asphyxiation gases throughout the forest, destroying everything that was hidden in it."<sup>26</sup> The order stressed that "in each case notifying the civilian population (of resorting to gas to smoke bandits out of the woods)."<sup>27</sup> This special note mentioned "notifying" the civilians, but the word itself could be too abstract and vague to be effectively implemented. In fact, however, gas shells bombarded not only the forests, but also villages in the Tambov region. On August 2, 1921, a battery in Inzhavinsky fired "65 shrapnels,

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<sup>24</sup> Ian Ona Johnson, "Lenin's Forgotten War in Tambov," *Dissident*, November 15, 2016.

<sup>25</sup> Stephane Courtois, Nicolas Werth, Jean-Louis Panne, Andrzej Paczkowski, Karel Bartosek, Jean-Louis Margolin, *The Black Book of Communism: Crimes, Terror, Repression*, trans. Jonathan Murphy and Mark Kramer (Cambridge, MA: Harvard University Press, 1999), 109-133.

<sup>26</sup> B. Sennikov, *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.

<sup>27</sup> RGVA. F.235. Op.2. D.13. L.34 - 34 about. Posted on Sat. "Antonovschina." Peasant uprising in the Tambov province in 1919-1921. - Tambov, 1994.

49 grenades and 59 chemical projectiles” at the village on an island on the lake near Kipets.<sup>28</sup> The village had purportedly offered shelter and resources to some trespassing guerilla soldiers and was also home to some of the rebels. Although most remaining residents were unarmed and starving civilians who posed negligible threat to the battery’s military dominance in the region, the attack aimed to eradicate the rebels’ supplies and bases of operation and, more importantly, to demoralize the guerilla soldiers by killing their families.<sup>29</sup> The Red Army used chemical projectiles, usually as crude as sulfur mustard canisters, to target civilians rather than combatants. Militarily, the action deterred villages in the surrounding area to aid the rebellion guerilla forces further. The chemical strike traumatized and radicalized both the rebels and the civilians, generating great fear. In the words of a contemporary Bolsheviks soldier who recalled the event: “It was decided to conduct all operations in a cruel manner so that the very nature of the actions [taken] would command respect.”<sup>30</sup> The intentionally abused chemical weapons, aside from efficiently eliminating the Tambov Rebellion, established the dominance of Soviet power through “the show trials” of the disobedient.

Thus, during the Civil War, Bolshevik power utilized chemical weapons not merely for military purposes, but also to establish and reinforce their political dominance over a region and its population through threats and terror. The objective of using chemical weapons had shifted from a purely martial one to a psychological and political one with civilians being the new target. This shift, rather than stemming from a change in the general Russian mindset towards chemical

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<sup>28</sup> Sokolov Boris Vadimovich, *Mikhail Tukhachevsky: Life and Death of the ‘Red Marshal’* (Smolensk: Rusich, 1999), p206.

<sup>29</sup> S. Kosinev “Raport, Inspektor Artillerii Tambovskoi Armii [Report from the Inspector of Army Artillery, Tambov Province],” 1 July, 1921, reprinted in in B. Sennikov, *Tambovskoe Vosstanie [Tambov Rebellion]*.

<sup>30</sup> Quoted from Richard Pipes, *Russia Under the Bolshevik Regime* (New York: Alfred A. Knopf: 1993), p. 388.

weapons, was more of a direct growth from the Bolshevik's realization of the weapon's potency, learned from the White and the West during the Russian Revolution and the Civil War. The Bolsheviks' use of chemical weapons during the Tambov Rebellion testified the easiness of using CW to eliminate the dissident voices. The novelty and devastating effect of such weaponry and the relative under-developed protective means promised its effectiveness and efficiency in practice. To some extent, the ease to harness such power conditioned the newly-emerged USSR to rely heavily on the rule of terror during its following reign. The application of chemical weapons on the civilian population during the Civil War and the Tambov uprising hinted the Soviet ruling ideology's inclination towards punishment and terror. Although the weapons itself was put in practice only for a short period, its symbolic effect of fear and ruthless punishment for insurgents dominated the USSR society as a motif in the following decades.

Having used chemical weapons in the Civil War, the Soviets determined to continue their development. As the needs of the nation turned into political tools, the government sponsored the creation of special chemistry labs in the 1920s to serve particular needs of the Soviet regime under the CW program. In 1926, the OGPU, with Vyacheslav Menzhinsky as chairman, assembled a secret group responsible for assassinations and terrorist activities overseas using toxic chemicals, known as "Yasha's Group." The group's head, Yakov Serebryansky, had been convicted in 1909 of killing a Minsk prison commandant. After the Revolution, he worked in Palestine, France, and Belgium, establishing a network spanning into Western and Northern Europe and even across the Atlantic.<sup>31</sup> In the 1930s, NKVD chief Genrikh Yagoda provided a sufficient number of poisons as means for "definite ends" including assassinations and poisoning of high-ranked officers in the Party. Taking reasonable suspicions surrounding the show trials

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<sup>31</sup> Petrov and Skorkin, *Kto rukovodil NKVD*, p. 380.

during the Great Purge into account, Bulanov's words were a mixture of fictitious allegations with facts. The purpose of the secret lab, under the direct management of NKVD, was not the Bolshevik Party's internal but external executions and assassinations. The group had its own laboratory for chemical and biological poisons under the Soviet security service under the supervision of NKVD chief Genrikh Yagoda.<sup>32</sup> On January 26, 1930, Yasha's Group kidnapped and murdered General Aleksandr Kutepov, head of the White Russian Military Union (ROVs) in Paris, using chloroform that caused him heart failure after inhalation.<sup>33</sup> On September 22, 1937, the group successfully drugged a the White Russian general Yevgenii Miller, the successor of Kutepov as head of ROVs, and sent him back to Moscow for interrogations from which he died.<sup>34</sup>

The USSR originally needed chemical weapons for defensive and retaliatory purposes. In WWI, the tsarist army deployed chlorine gases (usually collected from abandoned German trenches) only for containing a German advance. Into the Soviet era, while these two core objectives remained unchanged, the potency and novelty of chemical weapons, especially the new nerve agents, attracted the Bolsheviks' attention as means for a rule of terror. Without foreign warfare as causes for research in more toxic agents, the USSR CW program proceeded for both the assassination needs and later, deterrence effects during the Cold War. The primary target of these weapons shifted from foreign enemies to internal enemies. "Yasha's Group" is one of the most famous example.

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<sup>32</sup> Gevorkyan and Petrov, "Terakty."

<sup>33</sup> Vadim J. Birstein, *The Perversion of Knowledge: The True Story of Soviet Science* (Boulder: Westview Press, 2001,) p85.

<sup>34</sup> Andrew Christopher and Vasilii Mirokhin, *The Sword and the Shield: The Mitrokhin Archive and the Secret History of the KGB* (New York: Basic Books, 1999), p41.

The use of chemical weapons solidified the division between the rulers and its subjects whom the regime intended to punish and terrorize. For the defectors from the regime, the USSR set up special groups to target and execute them. Chemical weapons often appeared in these assassinations for their tailored toxicity and confounding symptoms. Nikolai Khokhlov, a former KGB agent, defected from the USSR during his mission to kill Georgii Okolovich in Germany in 1954. In 1957, Khokhlov had become “deathly ill” from chemical poisoning. Although American doctors saved Khokhlov life, he became crippled. In his memoirs, Khokhlov called himself “an exhibit of the achievements of Soviet Science... nevertheless also living proof that Soviet science, the science of killing, is not omnipotent.”<sup>35</sup> Khokhlov’s attitude of bravely confronting the ‘science of killing’ from his motherland represented the victims’ determination to abandon the Soviet Union despite the psychological terror.

The legacy of such practices persists. On March 4, 2018, a former Russian military officer and a double agent for the UK’s intelligence service, Sergei Skripal and his daughter died from A-234 poisoning, a Novichok nerve agent, in Salisbury, England. As the USSR-developed agent self-evidently pointed to Russia as the culprit, the assassination drew the public’s attention to the regime’s long history of chemical attacks. The two early stages – involuntary learning and voluntary practicing and improvising – combined to delineate the starting direction of the USSR CW program. However, the first stage only constituted a necessary but insufficient factor in explaining the second. The British and French Army also suffered from German mustard gas during WWI. Nonetheless, the British and French civilians never suffered from their own programs as much as the Russian did. Two major factors lay behind this phenomenon. One will be discussed in the following chapter, the other is the continuous distrust between the Soviet

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<sup>35</sup> Nikolai Khokhlov, *In the Name of Conscience* (New York: David McKay, 1959), pp. 363.

power and its subjects. The distrust, puny or fictitious in the beginning, lured the government to use chemical weapons to discipline the people, only to enlarge the fissure.

From large-scale indiscriminate gassing to individual assassinations, chemical weapons added to the formation of a new mentality of “to submit or to be subjugated” in Soviet society. It was de facto approval of violence and terror in disciplining a government’s subjects. The Civil War experience transformed terror and fear, in the form of chemical weapons, into convenient ruling tools that are easily adoptable and would promptly generate the desired effects.

## **The Ergates: Workers Caught in between the Black and White**

While chemical attacks on dissidents among its own people deepened the distrust between the Soviet state and its subjects, another factor behind the Soviet civilian's unparalleled CW trauma lay within the gap between Russia's weak industrial foundation and the requirement of its CW program. As a vital national defense project, the CW program demanded highly efficient stockpiling of chemical weapons. However, from both perspectives of quality and quantity, USSR industrial chemistry labs and factories hardly possessed the capability to suffice the demand. The filling of such gaps between military orders and industrial capabilities led to misery and distress of those working in the "grey zone", the ergates in the perilous program. Cornered by monetary need, academic requirements, and naïve faith in patriotism, workers, science students, and chemists joined the USSR CW program only to discover that they had no choice but to sacrifice their health, freedom, and conscience for an immoral program.

Small-scale chemical facilities emerged in Russia at approximately the same time as in Western Europe. In 1748, Lomonosov established the first documented chemical laboratory in Russia. Moscow University, and Kazan University both established their chemical labs in the early nineteenth century, but both labs focused on teaching instead of research until the middle of that century. One of the first group of Russian chemists emerged as a research-oriented community between 1855 and 1865.<sup>36</sup> Before WWI, most Russian chemists were employed by the State and worked in higher educational institutions from universities to technical and polytechnic institutes. The government's negligence in the scientific circle deepened the research and industrial scientists' dissatisfaction with the regime. Russian chemist L. A. Chugaev noted in his diary in 1908: "We hardly have a chemical industry... [and] the fault is in the absence of

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<sup>36</sup> Nathan Brooks, "the formation of a community of chemists in Russia: 1700-1870" unpublished PhD dissertation in history, Columbia university, 1988.



moral and financial support from the government and society at large.”<sup>37</sup> Morally, the tsarist government, dealing with demonstrations and protests which many college students and faculties participated in, had no good impression on the scientists. Financially, the government could not afford sufficient budget for both research and teaching in chemistry due to the expensive price of lab instruments especially during the World War.

Soviet chemists, engineers, and researchers worked diligently to overcome backwardness in the chemical industry generally and with weaponry in specific. During the final days of the Tsarist regime, while Russian troops fell in mustard gas on the Eastern Front, domestic research on chemical weapons had barely begun. Compared to other theory-based subjects like mathematics in which the USSR matched surpassed Europe’s level, chemistry, which relied more heavily on industrial-scale facilities, progressed at best slowly in the USSR. Despite developing grass-root scientific institutions and societies, until WWI, Russia had relied heavily on the West European countries for technological support. Large chemical industries often left research and development to foreign sources. It was necessary for Russian graduate students in science, and also instructors and researchers, to go abroad, often to Germany, to obtain first-class education.<sup>38</sup> Vladimir Ipatieff, later a professor and a member of the Academy of sciences, and the head of Russian chemical warfare developments during WWI, recalled that the Artillery Academy (where he taught as an instructor in chemistry) was “entitled each year to send one of its instructors abroad for study... funded by the Minister of War.”<sup>39</sup> In 1896, Ipatieff joined the Baeyer Laboratory in Munich, Berlin, and conducted research on the structure and synthesis of isoprene in addition to the new explosive in use abroad. The two objectives of Ipatieff’s study-

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<sup>37</sup> Chugaev, 1924, p171.

<sup>38</sup> Loren R. Graham, *Sciences in Russia and the Soviet Union: A Short History* (Cambridge: Cambridge University Press, 1993), p80.

<sup>39</sup> Vladimir N. Ipatieff, *The Life of a Chemist* (Stanford: Stanford University Press, 1946), p78.

abroad program showcased the entanglement between academic/civil and martial chemistry in the final days of the Empire. Also, the underdeveloped research-industry bridge created in dangerous problems in both the research and the industrial sphere.

In WWI, the domestic chemical industry in Russia was very underdeveloped in comparison with the western nations. The production of sulfuric acid, a vital starting material in synthetic reactions, was 200,000 tons/year in Russia, but 1.8 million tons in Germany and 1 million tons in England.<sup>40</sup> Therefore, before the war, chemistry labs in Russian universities relied heavily on importations of chemicals to remain functional. However, WWI disturbed the international trading system and imposed a higher demand on the newly-established Soviet regime's industrial infrastructures. With foreign commerce hindered by war, the Soviet Union had to resort to domestic industries for the necessary materials. The substantial development of the USSR chemical industry only began in the 1930s. In the first Five Year Plan, Stalin demanded the improvement of the USSR's industrial constructions, including the chemical industry, as a priority. Besides building new factories, the executive department also ordered to convert existing factories into chemical production hubs as a faster way to fulfill the quota. One example was the Experimental Factory [*Opytnyi zavod*] in Petrograd. The large-scale production testing factory used to be a wine warehouse. Despite the grand goal, an article in *Izvestia*, issue January 15, 1930, reported on "Capital Industrial Construction in 1928/29": "it appears that work in constructing new factories is behind the overall plan mainly in the chemical industry, with 66.1 per cent of non-execution [a trifle]... whereas the figures are completely different from the point of view of the expenditure involved."<sup>41</sup>

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<sup>40</sup> Lel'chuk, 1964, p21.

<sup>41</sup> "Capital Industrial Construction in 1928/29", *Известия [Izvestia]*, January 15, 1930.

Although Soviet chemical industry until decades later did not meet the goal of a superior research environment, the nation's demand for chemical weapons led to good results in a number of fields. And yet, because of low standards, these places were dangerous to work. A series of research institutes emerged, even if some of them were of low scientific standing. According to the scientists who worked in GOSNIIOKhT, the State Scientific Institute of Organic Chemistry and Technology, a top-most research institute in the Soviet Union, the lab bench and the testing instruments "were constructed in a way that there were absolutely no guarantees that an accident could not occur to poison people."<sup>42</sup> In lower-level laboratories and factories within the CW program's research-production chain, safety measures were even poorer. Many suffered from chronic exposure to toxic or carcinogenic chemicals. Professor Semeyon Dubov, the head of the Physical Chemistry Department in GOSNIIOKhT, worked in one of the defense plants producing tetraethyl lead, a highly poisonous compound used as an anti-knocking agent, after graduating from Moscow State University. According to Dubov, "people often died there from poisoning, and the number of deaths was comparable to casualties on the battlefield."<sup>43</sup> The combination of unsafe instruments and amateur student workers who lacked proper safety knowledge and gears, drastically increased chemical weapon production's unintended and avoidable harms on the USSR people off-front.

Despite the dangers, harsh conditions and close surveillance of the CW programs, many scientists chose to join them. Financial advantage was one significant factor. To encourage the outstanding scholars to join the defense programs, engineering-technical personnel in the defense

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<sup>42</sup> Mirzayanov, p. 94.

<sup>43</sup> Mirzayanov, p. 177.

sector were better paid than those in the civilian industry.<sup>44</sup> Mirzayanov decided to work in CW research labs precisely for this reason. Freshly graduated from his doctoral program, divorced and with no place to live in Moscow, Mirzayanov, introduced by his master thesis advisor, very much cherished the opportunity to a post of super-secrecy. When visiting the office, he sensed that “it was a suicidal business,” but accepted the offer because he “was strongly motivated by the salary, so [I] could have my own place to live in.”<sup>45</sup> GOSNIIOKhT also compensated employees who worked closely with chemical agents, not precursors, with “hazard bonus”, which oftentimes totaled 55 percent of standard salary.<sup>46</sup> Despite the known health danger of such posts, they were extremely popular among the researchers working in the CW program.

Surprisingly, many university students also worked in the CW program, not intending to become CW scientists, but to fulfill their graduation requirements. The university system left the graduate students pursuing higher degrees no option but to accept their assignments for a two-year practicum, and this might be in a chemical weapons plants. This policy forced many students into USSR’s CW programs and hindered the development of the programs by pumping under-qualified personnel into key positions. Upon his graduation from the Lomonosov Institute of Fine Chemical Technology (MITKhT), Mirzayanov was offered work at a secret establishment for producing boranes, a highly explosive and poisonous compound used in making rocket fuel. Meanwhile, his other classmates were “assigned to various scientific research institutes and plants.”<sup>47</sup> In the borane factory, “the work was very intensive and dangerous, because the experimental reactor for producing diborane was leaking occasionally...

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<sup>44</sup> Agursky, *op. cit.*, pp. 21-22, 28-29; Smith, *op. cit.*, p. 236; Julian Cooper, *Defense Production and the Soviet Economy 1929-1941*, CREES Discussion Paper, University of Birmingham, 1976 [*op. cit.*,] p.3.

<sup>45</sup> Mirzayanov, p. 76.

<sup>46</sup> Mirzayanov, p. 87.

<sup>47</sup> Mirzayanov, p. 55.

and it was too hazardous and labor-intensive an effort to replace the reactor.”<sup>48</sup> More absurdly, the coordinating system sometimes assigned posts to completely incapable personnel. As Mirzayanov complained about his job as a supervisor at the borane factory: “People with various qualifications and levels of training worked on my shift.” One of the workers in charge of “an important technological operation” at the plant was a student of journalism by correspondence at Moscow State University who almost always came to work in a tipsy state. The to-be journalist’s dereliction of duty caused a severe accident which could have “erased the entire plant plus one-fourth of Moscow.”<sup>49</sup> This incident both showed the low qualifications of lower-level workers in the USSR chemical industry and the nonchalant attitude of university students towards the serious defense industry. This nonchalance was the result of the students’ ignorance of the essence of such programs and a prevailing sense of impartiality and pessimism within the Soviet society, cultivated by chronic economic depression and incessant purges and witch-hunting.

To the workers and most of the researchers, the USSR’s CW program was simply an industry for work on assigned jobs until retirement. It was a mandatory practicum program during their educational trajectory, whose secrecy and danger provided them and their families a little extra privilege and convenience in their lives under the Soviet regime. Lower-ranked chemists, students, and workers were like the ergates within the massive secret CW program who filled in the gap between the industry’s reality and the demand using their health and flesh in exchange of scraps of food. The conformists and the loyal suffered from the CW program not much less than the rebels: miserable working conditions, frequent accidents at work, unethical research on WMD, and so on. The physically damaged workers and conscientiously baffled chemists working in the industry made up the second group of victims from the USSR CW

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<sup>48</sup> Mirzayanov, p. 56.

<sup>49</sup> Mirzayanov, p. 57.

program. The development of program heavily relied on the semi-voluntary sacrifice of the myriad civilian technicians and workers working in the industry. Reversely, the sacrifice also infringed the Party's authority, esteem, and power of deterrence within its people, especially those working as the scientific and technical 'engine' in the core of the program.

## **The Mad Scientists: When Politics and Deadly Weapons Intertwine**

“We do not have and cannot have old foundations of moral and ‘humanism,’ invented by the bourgeoisie... We are allowed to do anything...” —*The Red Sword*, the newspaper of the VCheKa troops, cited in Stetsovsky, *Istoriya*, vol. 2, p. 62<sup>50</sup>

Further upstream of the USSR CW program, above those directly or indirectly suffered from the chemicals in projectiles, factories, or labs, were the leading scientists and semi-politicians supervising and disciplining the colossal organization according to the government’s demand.

The root of entanglement between science and politics in Russia date to the seventeenth century when Peter the Great pushed the development of educational and scientific infrastructure to transform the nation into a European power with western views. Later tsars recognized the importance to support science only when Russia had suffered defeat or near defeat in war: 1812, the Crimean War, and the First World War. During the First World War, under the tsarist regime, S. I. Sozonov represented the chemistry society to establish a special temporary commission on supplies.<sup>51</sup> Geologists, engineers, and chemists in the Commission for the Study of Natural Resources (KEPS) also advised on mineral resources, fuel supplies, and chemical warfare.<sup>52</sup> After the Romanov Dynasty’s collapse, the new Soviet regime needed the scientists’ knowledge despite their intimate ties with the tsarist regime. Many scientists in the early Soviet years had worked for the Tsar. For example, chemist Ipatieff had been an industrial consultant to tsarist industries and headed the Chemical Committee on Defense during WWI. After the revolution,

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<sup>50</sup> Vadim J. Birstein, *Perversion of Knowledge: The True Story of Soviet Science* (Westview Press, 2001), p 102.

<sup>51</sup> Paul R. Josephson, “Science Policy in the Soviet Union, 1917-1927,” *Minerva*, Vol. 26 (3), September 1988: 342.

<sup>52</sup> B. A. Lindener, *Raboty rossiiskoi Akademii nauk v oblasti issledovaniia prirodnykh bogatstv Rossii; obzor deiatel’nosti KEPS za 1915-1921 gg.* (Petrograd, 1922); also, Bastrakova, *Stanovlenie...*, passim.

Ipatieff became the chairman of the Technical Section of the Council and later chemical advisor to the Supreme Council of National Economy. During NEP (1921-1926) he continued to advise the chemical industries and served as director of the Scientific Technical Administration (NTU).<sup>53</sup>

The Soviets, from the very beginning, demonstrated interest in supporting scientific research institutes (*nauchno-issledvatelskii institut*) “for matters of government construction”.<sup>54</sup> Realizing the importance of science and technology to build the socialist state, yet aware of the closeness between the scientific community and the tsarist regime, the Soviets endowed significant financial support and tight controls simultaneously. Both the main scientific administration of Narkompros and the scientific-technical department of the Supreme Economic Council served to control most institutes of the fundamental sciences, including chemistry.<sup>55</sup> But as the actual engine behind the CW program, the USSR chemists were under greater political and psychological pressure.

After the struggle for autonomy from government dictation throughout the 1920s, the centralization of research in chemistry and physics intensified within the Commissariat of Heavy Industry in 1931.<sup>56</sup> The direct and tight control over the Academy of Science ensured the penetration of politics into the academic and research arena. Later, in the field of military science, other government branches like the defense department and secret police furthered the entanglement between the scientists and politics. The centralization of the research institutes and regulation of the industry, while constraining certain fields of chemistry research, helped to

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<sup>53</sup> Ipatieff, p. 145.

<sup>54</sup> Josephson, p. 344.

<sup>55</sup> Samuel Oppenheim, “The Supreme Economic Council, 1917-1921,” *Soviet Studies*, XXV (July and October 1973), pp. 3-27.

<sup>56</sup> Josephson, p. 346.



streamline the research-production process and maximized the system's efficiency heading towards the desired direction of the regime.

Soviet chemists understood that financial and political support for the chemistry society required their allegiance to the regime and subordination to the state's demand. For the leading scientists of the country, political inclinations determined many aspects of their career. In the CW program, the infiltration of politics into the research field also significantly hindered the regular work of Soviet scientists, and the hindrance promoted unhealthy research initiatives. Non-scientists' (most often politicians') intervention on scientific research ranged from trivial matters regarding lab equipment to crucial issues like the research directions of the lab. In the word of Academy of Science's chemists, they needed to "become a 'necessary man' to the director of the institute... engage in 'politics,' lobbying for new rooms, laboratories, instruments, and increases in staff and bonus."<sup>57</sup> Such unspoken rules twisted the purpose of pursuing scientific breakthroughs in the CW field from, if not genuine good, patriotism, to personal advancement on the political ladder, regardless of moral obligations. Although the functioning of the Academy of Science relied upon the Soviet system, the system's disregards towards written rules and regulations also led to the researchers' indifference towards the legitimacy of the rules and laws within the political structure.

Besides daily research, the publication of scholarly articles was also under strict control by people who "possessed exceptional talent in demagoguery but not particularly flourishing in their scientific affairs."<sup>58</sup> The secrecy problem in the chemical industry was always crucial, just as for other fields of science, too. An expert in the field of gas chromatography who worked in GOSNIIOKhT recalled that he wished to publish multiple articles regarding gas

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<sup>57</sup> Mirzayanov, p. 91.

<sup>58</sup> Mirzayanov, p. 92.

chromatographic (GC) methods. But under the scrutiny of the committee, a genuine academic motive became intentions to “disclose the nature of the work of our enterprise” and was rejected out of the committee’s “primitive reasoning with no subject to appeal.”<sup>59</sup> Although the research was applicable in testing the purity of the end product of a new sarin plant, the new GC method would benefit other branches of chemistry research in determining micro-concentrations as well. The CW program overshadowing everyone’s work further prevented chemists from learning about each other’s work and created immeasurable obstacles for the overall research process.

Aside from the tangible obstacles in research, psychological pressure frustrated some of most talented scientists. Yuri Ermakov, a specialist in the field of catalytic chemistry, defended his doctoral dissertation at 35 years old and became the deputy director of the Catalysis Institute of the Siberian Branch of the USSR Academy of Science. He committed suicide due to “intolerable persecutions and bullying” of party committees at his institute and the Siberian Branch of the Academy of Science.<sup>60</sup> His persecution began when he hesitated to conform with one faction of the party committees’ dictation on his personal life. Here, political correctness and factional allegiance surpassed research and academic capability to become the decisive factor of a scientist’s fate. Conformity less than one hundred percent would put one’s life at risk is expressed, regardless of the person’s capability outside of partisanship. Ermakov represented a mere tip of the iceberg of the indirect victims of the Party’s omnipresent control over its chemical programs.

These examples show that the CW program’s emphasis on interpersonal relations and politically-sound behaviors were often more important than intellectual rigor in research. In academia, especially the subject of chemistry, was under the same pressure due to its close

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<sup>59</sup> Mirzayanov, p. 92.

<sup>60</sup> Mirzayanov, p. 62.

relation with the CW program. Without a solid industrial basis, besides in GOSNIIOKhT, other research scientists usually congregated in university labs under the Academy of Science's administration. Many of the critical positions within the academic institutes became the grasps of the Party and the secret police onto the education system. Qualifications for those posts relied more on popularity within the political system than on familiarity with the academia. Among many examples, the Moscow A. N. Bach Institute of Biochemistry, one of the top Biochemistry Institute in the USSR, owned a deputy director who was a consultant of the OGPU/NKVD and a director who was well known for his support for the Bolsheviks.<sup>61</sup> With only basic knowledge in chemistry from his study at the Military Institute, the deputy director more often strained the academic programs following the Party's demand than facilitating the program's functions.

Furthermore, this system blurred the line between research and academic, civil chemistry and weaponry chemistry, the "bright" and "dark" sides of science among the ambitious graduate students. In his memoir, a former KGB agent recalled a lecture by Pavel Sudoplatov when pursuing his master degree in chemistry. "At his [Sudoplatov's] lectures we learned... that a staff of nameless but exceptionally able doctors, chemists, and technologists, was developing and producing new types of weapons and poisons and devices for carrying out 'Liter L,' which was the code name for liquidation."<sup>62</sup> By glorifying the program and the people working in it, the intelligence services of the Soviet Union potentially attracted talented future-scientist to its secret works.

Patriotism, learned by the chemistry students in lectures, went on to influence the young scientists. The War-Chemical Committee, established with support from the military authority,

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<sup>61</sup> Birstein, p. 144.

<sup>62</sup> Dzhirkvelov, Ilya, *Secret Servant: My Life with the KGB and the Soviet Elite* (New York: Harper and Row, 1987), pp. 50-51.

undertook a variety of tasks including “the production of poison gases and measures to protect against poison gas,” among many other topics.<sup>63</sup> The Committee, in its Statutes, called for “joint and planned work on problems connected with the needs of national defense,” to which most Russian scientists responded out of patriotic sentiments.<sup>64,65</sup> Considering that Russian chemistry only began its systematic development since the Bolsheviks’ takeover, the amalgamation of patriotic sentiment, politics, and chemical research from the very beginning created a field of chemistry research where definitions of “good and bad” science gave way to the need of the nation.

The definitions of “good and bad” was dictated by the government and essentially the politicians overseeing the program. The close association between head of the deadly labs and politics contributed to blurring the redline. Despite the secrecy regarding the “Yasha’s Group”, the Bukharin show trial of 1938 rendered a glimpse into the scheme. During the interrogation, the assistant of Yagoda, Pavel Bulanov testified that Yagoda formed a “very close acquaintanceship” with a number of chemists and “gave direct instructions to build, or rather to arrange, a chemical laboratory.”<sup>66</sup> Given the close relationship between the academic and political world, Yagoda was naturally capable and in the position of recruiting scientific researchers for the NKVD’s political missions. The testimony also confirmed the vague line between “good” and “bad” science in the USSR.

The deterrence need came in later during the Cold War. With a prevailing atmosphere that valued scientific achievements over ethics, USSR chemists achieved wonders in military

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<sup>63</sup> Trudy, 1918, vyp. 2, pp. 8-10.

<sup>64</sup> *Otchet i deiatel'nosti fiziko-khimicheskogo obshchestva pri imperatorskom Universitete Sv. Vladimira za 1914 god.* god 5 (Kiev, 1915), pp. 52-3.

<sup>65</sup> Trudy, 1918, vyp. 2, p66.

<sup>66</sup> Tucker and Cohen, *The Great Purge Trial*, p. 481-482.

chemistry. As the artillery competition became more heated, the focus of the CW program research strayed further to the unethical side. In the 1970s, Yevgeny Bogomazov worked in the Physical Chemistry Department after earning his master degree at the Military Academy of Chemical Defense (MACD)<sup>67</sup> with a dissertation on evaluating gas-mask reliability. Bogomazov worked diligently and sought any possible opportunity of “career prospect”, including switching between labs thanks to his “diplomatic talents that worked wonders.”<sup>68</sup> He successfully discovered two analogs of soman and sarin that could break through an army gas-mask filter and the finding immediately gained the attention of the Chemical Troops at the Ministry of Defense and the Central Committee of the CPSU.<sup>69</sup> The revolutionary discovery gained Bogomazov large-scale resources to his lab and privileges within the GOSNIIOKhT.

Another significant figure characteristic of the group of scientists who supported the CW program was Grigory Mairanovsky. Instead of purely pursuing personal ambition like Bogomazov, Mairanovsky worked with deeply-rooted patriotism. Born into a Georgian Jewish Family, Mairanovsky worked in the Moscow A. N. Bach Institute of Biochemistry as a researcher for four years. Likely because of his close ties to the NKVD, Mairanovsky replaced Zbrasky as chair of the Department of Biochemistry at the Moscow Fist Medical Institute in 1934.<sup>70</sup> In 1940, Mairanovsky defended his doctoral dissertation titled *Biological Activity of the Products of Interaction of Mustard Gas with Skin Tissues*, which included the results of

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<sup>67</sup> Also known as Voroshilov Military Academy of Chemical Defense.

<sup>68</sup> Mirzayanov, p. 178.

<sup>69</sup> Thionic analogs of soman and sarin contained a thiol-group which would turn back to their oxygen analogs, the original, higher-toxicity formula, once they had passed through the filter. Detailed formulas and molecular structures in Mirzayanov, p. 180.

<sup>70</sup> RSFSR, People’s Commissariat of Health, A. N. Bach STATE SCIENTIFIC INSTITUTE OF BIOCHEMISTRY, June 10, 1934. No. 580. CERTIFICATE. (Sorokina)

experiments on humans.<sup>71</sup> Since then until his arrest in 1951, Mairanovsky had been heading a specialized laboratory at the All-Union Institute of Experimental Medicine (VIEM) with NKVD as his main affiliation, focused on testing different chemical agents and toxins on animals and prisoners.

As a scientist, Mairanovsky highly cherished his work and worked diligently. In a letter addressed to the president of the USSR Academy of Medical Sciences Academician Nikolai Blokhin in 1964, Mairanovsky mentioned that “the only preserved copy of my dissertation is coincidentally [!—V. Birstein] kept in KGB files by Professor V. Naumov. The other copies were barbarically destroyed during the time of Stalin’s Cult...”<sup>72</sup> After World War II, after visiting the German specialists who had human-experiment experiences, Mairanovsky proudly concluded that “the Nazi’s achievements in the field of poison were significantly less than ours.”<sup>73</sup> Throughout his research career, Mairanovsky did not hesitate to write letters proposing new researches or reconsiderations whenever his supervisor showed dissatisfaction with his work.<sup>74</sup> The nature of his research aside, Mairanovsky was undoubtedly an excellent research chemist and an active, supportive citizen of the USSR.

What was the mentality behind Mairanovsky’s unethical testing and research? First, Mairanovsky was undoubtedly supportive of the the Communist Party and the USSR, a real patriot. Sudoplatov acknowledged in his memoir that, during the WWII, Mairanovsky “played an important role in the anti-German actions.”<sup>75</sup> According to Sudoplatov, Mairanovsky in many occasions helped with KGB’s actions abducting German spies by substituting their suicide

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<sup>71</sup> Mairanovsky’s letter to Blokhin, May 18, 1964.

<sup>72</sup> Memorial’s Archive (Moscow), fond 1, op. 1, d. 2872.

<sup>73</sup> Mairanovsky’s report to Merkulov, mentioned in Bobryonev, “*Doktor Smert*,” p. 40; Bobryonev and Ryazentsev, *The Ghosts*, p. 181.

<sup>74</sup> Birstein, Chapter 3.

<sup>75</sup> Sudoplatov, P., *Spetsoperatsii*, p. 630.

ampoules and developing “truth potions.” Mairanovsky believed in the Party even after his arrest and persecution during the Great Purge. In one of Mairanovsky’s letter from Vladimir Prison addressed to Nikita Khrushchev in 1955, Mairanovsky confessed that “I and some of the other people who conducted this work had great misgivings: there was the struggle of personal feeling with state necessity.”<sup>76</sup> Nonetheless, except for this brief excerpt, Mairanovsky’s further reflection on the ethics of his work was absent, possibly because most of the relevant files remained classified until today.

However, Mairanovsky’s co-workers shared his sentiment to some extent. Bogdan Kobulov, the assistant of Mairanovsky, confessed during his interrogation in 1953 that “I do not think so [such experiments are crimes against humanity] since the end purpose of the experiments was the war against enemies of the Soviet government... I obeyed the orders to perform the experiment, but as a person I believed they were undesirable.”<sup>77</sup> During the Mairanovsky case investigation in 1954, Mikhail Filimonov, a research fellow at Mairanovsky’s lab also testified about the experiments: “I witnessed some of the poisoning tests, but I tried not to be present at the experiments because I could not watch the action of poisons on the psyche and body of humans. Some poisons caused extreme suffering. To conceal shouts, we even bought a radio set which we turned on [during the experiments].”<sup>78</sup> Although the testimonies could be biased out of self-defense, clearly the scientists were aware of research ethics.

Birstein accused the Mairanovsky-researchers of “rationalizing their collaboration with the KGB just as did their colleagues in 1930s Germany who did not hesitate to follow Nazi

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<sup>76</sup> Mairanovsky’s letter to Khrushchev, dated August 1955, cited in Bobryonev, “*Doktor Smert*,” p. 294; translated in Bobryonev and Ryazentsev, *The Ghosts*, p. 146.

<sup>77</sup> A transcript of the interrogation is cited in Bobryonev, “*Doktor Smert*,” pp. 393-394; translated in Bobryonev and Ryazentsev, *The Ghosts*, p. 173.

<sup>78</sup> A transcript of the interrogation is cited in Bobryonev, “*Doktor Smert*,” pp. 409-411.

orders... motivated by moral weakness and fear.”<sup>79</sup> Birstein’s analysis focused on the potential negative impacts of unconformity. In addition, conformity to the reality promised luring rewards, which constituted another half of the picture of the chemists’ motivations. Most who chose to conform out of the so-claimed patriotism or personal career aspirations received their expected gains. To these chemists, the USSR CW program was simply a highway to success – they proceeded by following the Party’s directions without genuinely paying attention to the scenery, to the development of Soviet chemistry. The endorsement of the USSR regime, to this point, simply equaled to a prerequisite of the chemists’ personal success but not their genuine support of the Soviet ideology or politics. As the scientists within the CW program gradually realized the essence of their work and tormented by the conflict between ethics and commands, their faith in the regime faded to apathy and egoism. This mentality was both a reason behind and a consequence of the USSR’s waning power both domestically and internationally in the late twentieth century.

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<sup>79</sup> Birstein, p. 196.



## **Breaking Apart**

*“More than a few of the people present wondered: Why do we need all of that, when our country is suffering from acute shortages and everything is on the slippery slope down to Hell?”<sup>80</sup>*  
— Vil Mirzayanov’s Diary, 1987

In the last decades of the USSR, the fading faith in the socialist regime touched the core of the society. Compared to the rest of the population, those who worked closely with the regime, including in the CW program, had grown into a loyal body as a group yet experienced greater disillusionment. The insiders’ knowledge of the cruel purposes, distorted ethics, and political pressure upon the program alienated the core intellectual forces from the regime. As the Soviet government’s authority waned, the chemists’ rebellion to their motherland and disclosure of the CW program joined the list of unwanted disclosures during the Glasnost era, contributing to the growing distrust between the general population and the USSR government.

The War-Chemical Committee, established with support from the military authority, undertook a variety of tasks including “the production of poison gases and measures to protect against poison gas,” among many other topics.<sup>81</sup> The Committee, in its Statutes, called for “joint and planned work on problems connected with the needs of national defense,” to which most Russian scientists responded out of patriotic sentiments.<sup>82,83</sup> Considering that Russian chemistry only began its systematic development since the Bolsheviki’s takeover, the amalgamation of patriotic sentiment, politics, and chemical research from the very beginning created a field of chemistry research where definitions of “good and bad” science gave way to the need of the nation. Politics and patriotism twisted together to build the chains strangling the chemists. Later,

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<sup>80</sup> Mirzayanov, p. 192.

<sup>81</sup> Trudy, 1918, vyp. 2, pp. 8-10.

<sup>82</sup> *Otchet i deiatel’nosti fiziko-khimicheskogo obshchestva pri imperatorskom Universitete Sv. Vladimira za 1914 god.* god 5 (Kiev, 1915), pp. 52-3.

<sup>83</sup> Trudy, 1918, vyp. 2, p66.

when scientists realized the wicked nature of their work and wished to stop, the only way to escape from all the entanglement was to break away from the chain – from both the Party and the Union.

Before the final years of the USSR, out of fear for disobeying the Party's command or expressing objections to their superiors, the chemists acknowledged the absurdity of the regime without publicly voicing. After he was promoted to one of the labs under the leadership of Bogomazov, Mirzayanov "was tormented at the moment by the vision of children meeting their painful deaths in gas masks, which became absolutely useless against a chemical weapons attack, thanks to Bogomazov's discovery."<sup>84</sup> Instead of following the order for him to develop chemical agents' testing methods, Mirzayanov developed a chromatographic method adoptable for research in both chemical agents and ordinary compounds, which "comforted me [Mirzayanov] to a great extent... because I was tormented by great doubts about the utility of all our work [on CW] after conversations with my friends Kostenko, Drozd, and others... I consider myself a researcher solving problems of general scientific importance."<sup>85</sup> The highly-praised scientific breakthroughs in the USSR emerged to the chemists as pointless and sickening, especially in a society haunted by chronic shortages in almost all commodities.

The presence of this kind of "conversation" between researchers of the CW program indicated the prevalence of skepticism among the scientists towards their work ethics, the CW program, and the Soviet regime. The USSR CW program fell into further chaos, shackled by the chemists' passive resistance. Some of the chemists would "offer to take anything you wanted out from the territory of GOSNIIOKhT for a few hundred milliliters of alcohol."<sup>86</sup>

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<sup>84</sup> Mirzayanov, p. 182.

<sup>85</sup> Mirzayanov, p. 170.

<sup>86</sup> Mirzayanov, p. 231.

Witnessing disorder and desolation, Mirzayanov realized that the chemical arms race “had nothing to do with boosting the defense potential of the country” and that “apparently only a narrow circle of interested military and civilian generals benefits from the insanity that relied on the slavish and poorly paid labor and scientists working in hazardous conditions!”<sup>87</sup> Rather he understood that to induce changes – both in the program and the society, the people within should began to speak up to build a channel allowing the outsiders to know the truth.

Mirzayanov was among one of the first chemists to stand up against the USSR CW program and the Soviet political system. In October 1988, he presented a report on his findings of the dangerously high concentrations of sarin and soman in the air and the nearby “White Sea” to the Council on Technical Counterintelligence of the Ministry of Chemical Industry. However, the committee deemed his conclusions, which he made based on concrete, first-hand data, as “unfinished, without the endorsement of GOSNIIOKhT, should be checked and verified.”<sup>88</sup> This incident, as the last straw, disheartened Mirzayanov as he felt like the value of the whole CW program was “just to provide the corrupted criminals with cover for their crimes against innocent people.” On May 4<sup>th</sup> of 1990, Mirzayanov submitted his resignation notice to the Party Committee, the first of its kind from GOSNIIOKhT.

Well-aware that the USSR “had no intention of honestly meeting its commitments,” Mirzayanov drafted and published his first article exposing the USSR CW program in *Kuranty* on October 10, 1991.<sup>89</sup> The article, without any editorial modification, revealed the procession of USSR CW program in violation of the Convention on the Prohibition of Chemical Weapons and at a time when the United States had stopped its program. Mirzayanov also called out the

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<sup>87</sup> Mirzayanov, p. 228.

<sup>88</sup> Mirzayanov, p. 232.

<sup>89</sup> Mirzayanov, p. 250.

directors of the program, claiming them “self-proclaimed true patriots, ready for any fraud.”<sup>90</sup>

The article undoubtedly caused huge repercussion among both the political and scientific circles as well as the general public within the USSR. The Committee of Democratic Movement of Russia issued a leaflet in Mirzayanov’s support disregarding potential retaliations and persecutions.<sup>91</sup> Strangely, the KGB paid less attention to this revelation than as expected. The bureaucracy in KGB, GOSNIIKhT, and the government coordinated in such a disorganized fashion that it astonished Mirzayanov and his lawyer, postponing his trouble until a year later.

In 1992, Mirzayanov and Lev Fedorov co-authored another article regarding the secret CW program in the USSR in *Moscow News*, titled “Poisoned Policies”. The article further revealed Russia’s continuing tests and productions of chemical weapons despite international pledges to the contrary, warning the Muscovites of health risks due to the concealed proximity of those factories to Moscow. Simultaneously, Will Englund, a journalist for the *Baltimore Sun*, published his interview with Mirzayanov and another ex-chemist in the CW program, Edward Sarkisyan, confirming the continuation of the clandestine USSR CW program.<sup>92</sup> The articles, drawing international attention, finally sent the KGB agents to Mirzayanov’s door on October 22, 1992.

Mirzayanov was simply an example from the scientific community whom the CW program forced to rebel from their homeland and the Soviet society. The CW program alienated some of the most talented chemists and researchers in the USSR just as other programs did in other spheres of the society. The unpreventable break rooted in the deep entanglement between

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<sup>90</sup> Vil Mirzayanov, “Inversion”, *Kuranty*, October 10, 1991.

<sup>91</sup> “The Committee of Democratic Movement of Russia in GRNIIOKhT, Witch Hunt” at GRNIIOKhT, September 1991.

<sup>92</sup> Will Englund, “Ex-Soviet Scientists Says Gorbachev’s Regime Created New Nerve Gas in ’91,” *Baltimore Sun*, September 16, 1992.

science, ethics, and politics. As politics kidnapped patriotism during the starting and developing stages of the CE program, to stand against the program unavoidably means to stand against patriotism, causing the breaking ties between the defected chemists and their motherland. Although this mix-up tactic successfully activated the scientists' passion for the CW program in the early days, it also turned out to be one important cause of the program and the regime's downfall.

## Conclusions

Imagine a Mark V tank advancing across the fertile Volga soil. Captured from the hands of Germans, it was remodeled to incorporate a giant skeleton made of corroded steel and colossal fuel tank with cracks and holes. It intrepidly proceeded, smashing every pebbles and small animals in its way and leaving scar-like trails on the earth. Fuel flowed incessantly into the oil tank to feed and pace the gigantic beast while the axles and parts silently worn out to keep up with the gear settings. The driver navigated following the command, caring more about rising through the ranks than about the route. The tank was like the USSR CW program with its wretched industrial facilities. The pebbles were the suffocated insurgents and dissidents. The fuel and parts were the distressed workers and researchers. The driver was the leading chemists.

Just like Mark V tanks serving to pave the battleground for the infantry's takeover, the CW program intended to uphold and secure the USSR regime, in terms of both dominion within and deterrence abroad. In both examples of the Tambov rebellion and series of foreign assassinations, the CW program, working with the secret policy and intelligence agents, effectively erased the domestic dissident voices and potential threats to the Bolsheviks and later Socialist regime. The toxic substances not only physically damaged its target, but also psychologically deterred the others from harboring unfavorable idea to the regime. The Tambov suppression marked a turning point of the Soviet society heading into the era of terror. The chemical assault on the rebels' accomplices and the innocents disrupted the international acquiescence to use chemical weapons as strategic tools for territory-denial. Such attacks, similar to the Great Purge decades later, tarnished the trust and empathy within the society, splitting families and friends into individuals therefore inhibiting congregations of civilians who would

challenge the Party's decision. Ostensibly, chemical weapons introduced the rule of terror to the Soviet society, which paved the foundation of the regime's authority for the upcoming century.

Surely, a tank could be an intimidating force during wartime and could gain tremendous advantages to its side. The problem with the USSR CW program was that it continued to function and expand at wartime-speed after the conclusion of the warring period which distorted its objectives, caused unnecessary trauma, and worsened its entanglement with politics. While the rebellion was put down with blood and fear, the silencing effect brought by chemical weapons' power only concealed the social problems and resentment. In the short term, the government could quickly and effectively establish its authority. However, as social dissatisfaction went unseen and untreated for decades, problems stacked and created a social atmosphere of pessimism, which permeated into the working force behind the CW program.

Most workers and researchers within the USSR CW program had no other choice. Universities demanded that students who wish to pursue a higher degree in natural sciences work for two to four years in the industry. Students of other subjects also had to follow the national allotment of practicum upon graduation – sometimes to posts which they had few related knowledge or experience. As the pessimistic feeling infiltrated the student workers, negligence at work and nonchalance towards the program could cause catastrophic accidents and threaten many lives. Ordinary workers and scientific researchers, on the other hand, were largely driven by economic need. The CW program, with its higher salaries and higher social esteem, lured the desperate laborers or graduates to sacrifice their privacy, freedom, and health. Patriotism also strongly appealed to this group, justifying their sacrifice and the immorality of the research in the name of their motherland. Consequently, the disillusionment stroke this group of civilian's belief in the regime hard. The experience of the civilian participants of the CW industry essentially

added to the social atmosphere of pessimism and hindered the overall productivity and prospects of the USSR. The workers and lower-level researchers formed the largest channel between the CW program and the general population. Yet, when negative sentiment accumulated within the channel, the reversed current carrying distrust could further disturb the society and shake the regime's foundation.

The leading scientists, the “drivers” of the CW program following the government's orders, also contributed to the downfall of the program and the regime. Unlike the other two groups who suffered physical damage, the high-ranked scientists struggled with the invisible constraints of the political system. On the one hand, as political conformity weighed more than academic and moral standards, the CW program proceeded more difficultly. Party control and politics dictated every aspect of the research-production cycle – funding, staffing, and publishing all relied more on interpersonal skills and the preference of the party committee. The political entanglement not only hindered the development of scientific findings, but threatened scientists' lives should they not fully cooperate and subjugate to the party dictation. On the other hand, the leading scientists who realized the power of the party led the program astray. Some of them, like Mairabovsky, utilized the party's power in setting the moral standard to justify his immoral research for personal reputation and satisfaction. Some others, like the deputy director of Moscow A. N. Bach Institute of Biochemistry, interested more in joining the politicians' rank than fulfilling actual administration or research duty. The consequence, unsurprisingly, was the breaking down of the Soviet CW program, which ultimately boosted the downfall of the Soviet regime.

The CW program, with its inherently unethical objectives, hazardous environment, and suffocating political and bureaucratic interventions dictating the strayed directions of chemical



research that intensified with the declination of the government's power, exemplified the suicidal trajectory of the USSR. From supporters to the dissidents of the regime, from doctors in science to illiterate farmers and workers, the CW program contributed to the ultimate collapse of the Soviet Union through its sphere of influence encompassing such a wide range of populations and profoundly shaping the society.

Throughout the USSR's history, chemical weapons had been a tool for eradicating insurgent voices among the Soviet subjects – resurgent peasants, dissenters, and ordinary citizens. The use of chemical weapons against its own civilians easily established the Bolsheviks' absolute authority in the USSR without them necessarily understanding or solving the underlying social problems. In the Tambov rebellion, for example, chlorine gas wiped out the guerilla insurgents but not famine and the Red Army's confiscation of grain in the rural regions. Throughout the years, the seemingly absent social problems – poverty, deflation, underworking, etc., accumulated and added to the burden of the ordinary workers within the CW program. As social-economic difficulties cornered civilians into the CW industry, the outdated facilities, dangerous working positions, abusive party-supervisions, and ethical doubts caused them immeasurable trauma both physically and psychologically. However, in the reverse direction, the exploitation of the grass-root workers and researchers in the CW industry also damaged the image of the regime among the population who fueled the gigantic machine of Soviet society. Further above the ladder yet still below the governing class, the leading scientists in the CW program suffered comparatively the least. Nonetheless, for some, the deteriorating power of the Soviet Union excused them of their unethical research in pursuit of personal success. For the others, the irreparable regime forced them to abandon the program and the USSR in the face of the clash between their conscience and loyalty.

Supposedly, committed development of the defense programs with an accumulating stockpile would granted confidence and assurance to the USSR government and its people. First-strike capability would gain diplomatic advantages for the USSR in the international political arena. Second-strike capability would deter potential invasions and check other WMD-capable powers. For the Soviet civilians, the CW program, like many other defense programs, instilled and reinforced “nationalism” from the beginning stage of the Soviet Union and established the union’s strength to expand its influence and protect its people.

Although the patriotism card fulfilled its role in the beginning and growing stages of the CW program, the USSR’s civilian population who were tangential to the CW program gradually realized the hoax of “patriotism”. To the contrary, the CW program prompted them to question their trust in the government and disheartened them by eliminating their hope for solutions to the existing social problems. From Tambov to GOSNIIOKhT, chemical weapons only triggered the misery among their victims, manufacturers, and creators alike. Just like the CW program emerged, expanded, and collapsed, the people who had experienced the chemical weaponry also witnessed the rise, the consolidation, and the deterioration of the Soviet Regime. The two processes synchronized based on a mutually supportive relationship. The CW program relied on the regime’s power to finance, staff, and discipline its functioning. The regime also needed the CW program as its forceful tool to uphold its power. The victim-perpetrators of the chemical attacks, therefore, diligently served for the Bolsheviks’ seizure of power, but also prompted the disintegration of the Union when their faith in the regime shattered. From the perspective of world politics, the USSR’s CW program had always been a great tool, for defense and deterrence, in upholding the USSR as a superpower in the twentieth century. However, from the civilians’

perspective, the program was simply a bitter lesson of history that the world should remember and never repeat.

During the Russian Revolution, Peter Petrov wrote in a letter to his wife: “Through the thick fog of lies and the waves of various kinds of poisonous gases and amidst the tremendous noise of the bloodthirsty animals and the watchdogs of capitalism and privilege we can see the approaching light, joy and happiness for the suffering peoples and beautiful prospects for ourselves.”<sup>93</sup> Never would he expect that the Soviet society never treaded through “the poisonous gas”. Since the day it first lingered on the sleeves and helmets of Russian soldiers until the collapse of the Union, chemical weapons research and production had been an inextricable part of the Soviet regime. Although President Putin announced Russia’s complete destruction of its chemical weapon stockpile in September 2017, the USSR’s chemical weapon legacy still exerts a lasting influence on both Russia and other regions in the world. This legacy includes the mentality as a nation with chemical-attack capability, the accumulated information on the manufacturing technology, and the enormous stockpile of chemical weapon starting materials in Russia and post-Soviet nations like Ukraine. Therefore, it would be necessary to further investigate the influence of chemical weapon programs in the Soviet Era from a broader perspective and to comprehend the origin of this legacy for a better understanding of the ways in which domestic, geopolitical and scientific forces shaped such experiences.

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<sup>93</sup> Letter No. 170., December 14, 1917.  
<https://www.marxists.org/archive/petroff/1918/letters.htm>

# Bibliography

## Primary

Burck, G. et al., Chemical Weapons Process Parameters, Vol. I: Main Report (Alexandria, VA: EAI Corp., Report No. DNA-TR-91-217-V1, November 1992).

Dee, W. C., U.S. Army Chemical-Biological Defense Command, personal communication, 1993.

Defense Intelligence Agency of the United States of America, "Soviet Chemical Weapons Threat" (1985) DST-1620F-051-85

Englund, W. "Ex-Soviet Scientists Says Gorbachev's Regime Created New Nerve Gas in '91," *Baltimore Sun*, September 16, 1992.

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.

Khokhlov, N. *In the Name of Conscience*. New York: David McKay, 1959.

Kosinev, S. "Raport, Inspektor Artillerii Tambovskoi Armii [Report from the Inspector of Army Artillery, Tambov Province]," 1 July, 1921, reprinted in in B. Sennikov, *Tambovskoe Vosstanie [Tambov Rebellion]*.

Letter No. 170., December 14, 1917. Correspondence of Irma and Peter Petroff, 1917-1918. <https://www.marxists.org/archive/petroff/1918/letters.htm> Accessed 01/27/2019.

Lindener, B. A. *Raboty rossiiskoi Akademii nauk v oblasti issledovaniia prirodnykh bogatstv Rossii; obzor deiatel'nosti KEPS za 1915-1921 gg.* (Petrograd, 1922); also, Bastrakova, *Stanovlenie...*, passim.

Mirzayanov, V. "Inversion", *Kuranty*, October 10, 1991.

Mairanovsky's letter to Blokhin, May 18, 1964.

Mairanovsky's letter to Khrushchev, dated August 1955, cited in Bobryonev, "Doktor Smert," p. 294; translated in Bobryonev and Ryazentsev, *The Ghosts*.

Mairanovsky's report to Merkulov, mentioned in Bobryonev, "Doktor Smert,"; Bobryonev and Ryazentsev, *The Ghosts*.

Memorial's Archive, Moscow.

Mirzayanov, Vil S. *State secrets: an insider's chronicle of the Russian chemical weapons program* (New York: Cornell University Press, 1997).

Niemann, Albert. "Über die Einwirkung des braunen Chlorschwefels auf Elaygas," *Annalen der Chemie und Pharmacie*, 1860, 113.

People's Commissariat of Health, A. N. Bach STATE SCIENTIFIC INSTITUTE OF BIOCHEMISTRY, June 10, 1934. No. 580. CERTIFICATE. (Sorokina)

Russian News Agency TASS, Destruction of Chemical Weapons in the Russian Federation [Уничтожение химического оружия в РФ]. URL: <https://tass.ru/info/4333286>, Accessed January 19, 2018.

Russian State Historical Archive [RGIA], Moscow.

"Struggle for Soviet Power in Crimea: Documents and Materials." Party Archive of the Crimean Regional Committee of the Communist Party of Ukraine, State. Archive of the Crimea region. T. II. - Simferopol: Krymizdat, 1961.

Sudoplatov, P., *Spetsoperatsii*.

The New York Times. "GAS IS DEFENDED AS HUMANE IN WAR." *New York Times (1923-Current File)*, Aug 25, 1926. Accessed 01/22/2019.

The Committee of Democratic Movement of Russia in GRNIIOKhT, "Witch Hunt at GRNIIOKhT", September 1991.

World Health Organization, *Health Aspects of Chemical and Biological Weapons: Report of a WHO Group of Consultants*. Geneva: WHO, 1970.

## Secondary

Birstein, V. J. *The Perversion of Knowledge: The True Story of Soviet Science*. Boulder: Westview Press, 2001.

Boot, M. *War Made New: Weapons, Warriors, and the Making of the Modern World*. Gotham, 2007.

Brooks, N. "The formation of a community of chemists in Russia: 1700-1870" unpublished PhD dissertation in history, Columbia University, 1988.

Bundt, T. S. "Gas, Mud, and Blood at Ypres: The Painful Lessons of Chemical Warfare," *Military Review*, July-August 2004, p. 81.

Burck, G. M. and Charles C. Flowerree, *International Handbook on Chemical Weapons Proliferation*. New York: Greenwood Press, 1991.

*Chemical Weapons in Russia: History, Ecology, Politics*. [Khimicheskoye Oruzhiye V Rossii: Istoriya, Ekologiya, Politika ] by Doctor of Chemical Sciences Lev Aleksandrovich Fedorov. (Moscow: Center of Ecological Policy of Russia, 1994) [27 July 1994]

Christopher, A. and Vasilii Mirokhin, *The Sword and the Shield: The Mitrokhin Archive and the Secret History of the KGB*. New York: Basic Books, 1999.

CIA, "Possible complications for the US national defense as a result of the use of the Soviet Union chemical and toxic weapons," *Foreign Policy*, Nov. 1983.

Courtois, Stephane, Nicolas Werth, Jean-Louis Panne, Andrzej Paczkowski, Karel Bartosek, Jean-Louis Margolin, *The Black Book of Communism: Crimes, Terror, Repression*, trans. Jonathan Murphy and Mark Kramer. Cambridge, MA: Harvard University Press, 1999.

Duchovik, Ronald J. and Joel A. Vilensky, "Mustard Gas: Its Pre-World War I History," *Journal of Chemical Education*, Vol.84 (6) June 2007: 944-948.

Eisenstadt, M. *The Sword of the Arabs: Iraq's Strategic Weapons*. Washington Institute Policy Papers No.21. Washington: Washington Institute for Near East Policy, 1990.

Fitzgerald, G. J. "Chemical Warfare and Medical Response During World War I," *American Journal of Public Health*, April 2008, Vol 98, No. 4, p. 615.

Gilles, Francis. "Overcoming Cultural Differences," *NATO Review*, [www.nato.int](http://www.nato.int). Accessed 10/20/2018.

Hogendoorn, E. J. (1997) *A Chemical Weapons Atlas*, *Bulletin of the Atomic Scientists*, 53:5, 35-39, DOI: 10.1080/00963402.1997.11456768

Josephson, Paul R. "Science Policy in the Soviet Union, 1917-1927," *Minerva*, Vol. 26 (3) September 1988: 342-369.

Johnson, Ian Ona. "Lenin's Forgotten War in Tambov," *Dissident*, November 15, 2016.

Khayrulin, K., V. Kondratyev, *"Военлеты погибшей империи. Авиация в гражданской войне"*, Moscow, Yauza, 2008.

Lev Aleksandrovich Fedorov, *The Chemical Boomerang of the country of the Soviets (Chronicle of Life of unnecessary weapons in a disorderly country)* [Химический бумеранг страны Советов (хроника жизни ненужного оружия в безалаберной стране)], 2003.

Olson, K. "Disarmament and the Chemistry Industry," Brad Roberts, ed., *Chemical Disarmament and U.S. Security*. Boulder: Westview Press, 1992.

Oppenheim, S. "The Supreme Economic Council, 1917-1921," *Soviet Studies*, XXV (July and October 1973), pp. 3-27.

Pipes, R. *Russia Under the Bolshevik Regime*. New York: Alfred A. Knopf, 1993.

Sennikov, B. V. *The Tambov Uprising of 1918-192 and the spreading of Russia in 1929-1933*. Moscow: Posev, 2004.

Sutherland, R. G., "Thiodiglycol," in S. J. Lundin, ed., *Verification of Dual-Use Chemicals Under the Chemical Weapons Convention; The Case of Thiodiglycol*, SIPRI Chemical & Biological Warfare Series No. 13. Oxford, England: Oxford University Press, 1991.

Tanaka, Y. *Poison Gas, the Story Japan Would Like to Forget*, *Bulletin of the Atomic Scientists*, October 1988.

Tucker, Jonathan B. *War of Nerves: Chemical Warfare from World War I to Al-Qaeda*. New York: Anchor Books, 2006.

Vadimovich, S. B. *Mikhal Tukhachevsky: Life and Death of the 'Red Marshal'*. Smolensk: Rusich, 1999.

Williamston, H. "Farewell to Don. Civil war in Russia in the diaries of a British officer 1919-1920", Moscow, Tsentspoligraf, 2007.