A Lethal Combination: The German Army and Fritz Haber

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The Great War tore through Europe with more rage and violence than the world had ever experienced on such a large scale. This type of massive conflict, and the high stakes, created so much strife that some of the keenest minds of the war were forced to recognize the necessity of a quick resolution from the very beginning of the conflict. The German army realized if they were going to win the war they would need a way to tilt the playing field in their favor. This caused the military to work side by side with experts of many fields to develop new weapons that would bring a swift German victory. One of the most prominent experts in the field of chemistry was Fritz Haber. Fritz Haber proudly served the German army, as head of the Chemical Warfare Division during the Great War and was largely responsible for their development of lethal chemical gases as a new weapon, mainly chlorine.

The use of lethal chemicals in warfare was a violation of the Hague Declaration of 1899, and the Hague Convention of 1907 clearly prohibited the use of "poison or poisonous weapons."[1] Yet, as World War I was becoming more of a defensive war of attrition due to trench

[1] Yale Law School Library Website, "The Avalon Project: documents in law," Accessed November 1, 2014.

warfare that was occurring after the first major battles of the war, especially the first battle of the Marne. The German army decided to turn to Haber's lethal chemical weapons to see if it could give them the advantage in the current conflict. When this new technology was first introduced in battle most officers, soldiers, and civilians found it to be a horrendous and inhumane way to fight. Yet, Fritz Haber believed that the use of chemical gases were just as humane as any other weapon used to achieve victory and defended that the use of these new chemical weapons could lead to a much quicker resolution to the conflict and despite its ethical and political violations, the effectiveness of German chemical warfare was a necessary tool in a time of war to achieve victory.

The German army was the first to use a lethal form of chemical gas in battle, but it is unclear who actually used the first form of chemical gases as a weapon. Reports show that the Germans and French used a form of non-lethal laughing gas, in the first months of the war. This non-lethal form of gas, dispensed by a hand grenade that was thrown into the enemy trench, only made their victims laugh and cry uncontrollably. This would allow the soldiers to gain control of the trench with much less resistance. A correspondent for *The New York Times* reported about a factory in France that produced these grenades and demonstrated the effects on soldiers during tours of the factory. According to the correspondent, among newer bombs that were being manufactured at the time, were chemical hand grenades and artillery shells that released a gas similar to laughing gas. These chemical weapons were publically tested on soldiers and provided France with a means to put an enemy out of the fight without violating the Hague Conventions because the gases did not asphyxiate individuals.[2] The French first used these non-lethal chemical weapons in war in late August of 1914 and the Germans used non- lethal chemical weapons as early as October of 1914.[3] To show that the new technology they were using was not in violation of the Hague Conventions, the French were even going as far as showing the public that the form of gases they were using were non-lethal. The Germans, however, were taking a much different strategy with their use of chemical weapons.

In the very early days of the war German chemists, engineers, physics, and other bright minds were working at the Kaiser Institute in Berlin to create new weapons that could help them win the war. This is

[2] "French Bomb Causes Laughter and Tears: Fumes Make Victims Helpless for Several Minutes, But Otherwise is Harmless," *New York Times,* June 6, 1915.
[3] L.F. Haber, *The Poisonous Cloud: Chemical Warfare In the First World War* (Oxford: Clarendon Press. 1986.), 51, 170-172; Charles Heller, *Chemical Warfare in World War I: The American Experience 1917–1918* (US Army Command and General Staff College 1984), 4-6. It should be noted here that L.F. Haber, the author of *The Poisonous Cloud* was the son of Fritz Haber and repudiated his father's work with chemical weapons.

where the German army would work side by side with experts of many fields, to create new weapons that would implement the new technology of the times. Weapons such as tanks, flamethrowers, airplanes, zeppelins, U-boats, and chemical weapons were being created here. Fritz Haber, however, exceeded all others in terms of talent and ability at the institute. Haber and his team of chemists successfully came up with ways to effectively use lethal gases as a weapon. In the early part of the war, after a brief trial of the non-lethal chemicals, the first lethal chemical they focused on was chlorine. A special correspondent for the *London Times*, who was at this Institute during Haber's time there, shows that the institute was a place of great importance to the military. "We could hear the tests that Professor Haber was to carry out at the back of the institute with the military authorities, who in their grey steel cars came to Haber's Institute every morning. There were seven or eight men working in the Institute on these problems, but we heard nothing more until Haber went to the Battle of Ypres."[4] Unlike the French, the German army were keeping their work secret because they were planning on using lethal chemical gases.

Fritz Haber's work at the Kaiser Institute caused him to become known as the "father of chemical warfare" because he played a very

[4] "Dyes As The Key To Gas Warfare," *London Times*, August 23, 1920.

important role in the development of lethal chemicals used as weapons.[5] During the first part of the war Haber and his team of chemists mainly worked on lethal chemicals such as chlorine as a weapon because of its lethal capabilities and its density. Haber would work day and night to accomplish his task of helping Germany find new weapons to win the war. At first, Haber and the Chemical Warfare Division were having trouble of coming up with methods to effectively disperse the chemical of chlorine. They found that releasing chlorine from artillery shells, did not release enough of the chlorine to be effective. Yet Haber, was determined to use chlorine because of the density. The density of chlorine would cause it to drop into the enemy trenches killing those hiding or waiting to attack, but also the wounded soldiers who could not escape. Haber eventually came up with the time released process that would allow the chlorine to be put in large barrels directly in front of the German trenches, then when the winds were blowing in the right direction, the chlorine would be ignited, which would then create clouds of fumes that would be carried by the wind towards the enemy as a lethal chemical agent capable of descending into the enemy trenches and not just floating past. As the Germans planned to use this new weapon they

[5] Daniel Charles, *Between Genius and Genocide: The Tragedy of Fritz Haber, Father of Chemical Warfare* (London: Pimlico, 2006). This phrase came from the title of this work.

knew it would clearly be a violation of the Hague Conventions, but that did not stop them from using Haber's lethal chemical weapons. The German army was more concerned with the attainment of victory in the war and not concerned with what other armies would think of the ethics of their new chemical weapon.[6]

The first successful large scale attack with the use of lethal chemical weapons was at the second Battle of Ypres on April 22, 1915. The German army used Fritz Haber's time released process that let the wind carry the chemical agent toward the enemy. They used 6,000 barrels that contained approximately 160 tons of chlorine along a 6km perimeter of Ypres.[7] J. French, the commanding officer of the British Army in France describes this chemical attack and disregard of The Hague Convention mentions about civilized war. After a very heavy bombardment of German artillery, the French soldiers saw the first large scale use of lethal gases and the birth of German chemical warfare. As the German soldiers began to ignite the barrels filled with chlorine, the French Division saw a thick yellow cloud of smoke slowly floating their way over no man's land and it that was coming directly from the German

[6] Charles, *Master Mind* 173-184; Hugh Slotten, "Humane Chemistry or Scientific Barbarism? American Responses to World War I Poison Gas, 1915-1930," *The Journal of American History* 77 (Sep. 1990), 476-498; Michael Freemantle, *Gas! Gas! Quick, Boys!: How Chemistry Changed the First World War* (Stroud: Spellmount, 2012), 50-60.
[7] Haber, 31-32.

trenches. As the chemical cloud hit the lines of the French, “the effects of these poisonous gases was so virulent as to render the whole of the line held by the French Division practically incapable of any action at all. It was at first impossible for anyone to realize what had just happened. The smoke and fumes hid everything from sight, and hundreds of men were thrown into a comatose or dying condition.”[8] Because the French soldiers did not know what was going on it caused mass chaos and panic as they were able to see what chemicals were doing to their fellow soldiers. It also allowed the German army to witness, firsthand, the lethal capabilities of Fritz Haber’s chemical weapons, and how they could help achieve total victory.

The French soldiers fighting at this battle were fully ready and equipped to fight the German soldiers as they had done in the previous battles of the war. However, what they were not ready for was this new weapon that killed men differently than other weapons of that time. Most French soldiers were staring across the battlefield and then suddenly see a mysterious thick yellow wall of smoke floating towards them. An article in the *Daily Chronicle* provided an account from a soldier who experienced the Second Battle of Ypres and the horrendous effects chlorine had on the human body. The article describes those who

[8] “Sir J. French's Dispatch,” *London Times,* July 12, 1915.

escaped as very affected by the chlorine as it attacked the lungs, and the bodies of the dead soldiers turned black by the fumes. When clearing the trenches of enemy soldiers the German army would take no prisoner that had been affected by the chemical gases, “whenever they saw a soldier whom the fumes had not quite killed they snatched away his rifle and advised him to lie down ‘to die better.’”[9]

This new weapon, developed by Haber, did not simply pierce through an individual or incinerate them. This new chemical weapon made a soldier suffer and feel like they were drowning. It would also cause soldiers to turn colors after they died which shows how violently the chemicals attacked the body from the inside. Before the technology of this new style of warfare a soldier might be able to survive his injuries. Soldiers might lose a limb or have to get a bullet pulled out of their stomach, but they were still able to live. However, with this new chemical weapon the German soldiers did not bother to take any prisoners because they knew the soldiers would die soon or it would take to long for the poisoned soldiers to get back their health.[10] A poem titled “Dulce et Decorum Est” by British soldier Wilfred Owen accurately

[9] "Cloud of Chlorine Borne by a Favoring Wind Germany's Novel Weapon that Swept Allies' Front; was Released from Bottles of the Liquefied Gas," *New York Times,* April 26,1915. This article was originally printed in the *Daily Chronicle.*
[10] Joy et al, "Historical Aspects of Medical Defense." *Medical Aspects of Chemical Warfare* (Falls Church, Va.: Office of the Surgeon General, U.S. Army, 2008,) 98.

depicted his first-hand account of the horrible way a soldier suffers from a chemical gas attack. Owen vividly remembers the German chemical gas attacks. He shares the dreaded moment of seeing the gas floating towards them and only being able to get his gas helmet on just in time, only to see one of his fellow soldiers suffering and drowning from the chemicals in his lungs. These chemicals soon kill Owen's comrade which cause him to change many different colors from asphyxiation. One verse from the poem states, "GAS! Gas! Quick, boys! An ecstasy of fumbling, Fitting the clumsy helmets just in time; But someone still was yelling out and stumbling and floundering like a man in fire or lime. Dim, through the misty panes and thick green light as under a green sea, I saw him drowning."[11] This showed Owen and other allied soldiers what the lethal German gases could do, and how chemical warfare could decimate the human body.

War has created some of the most inhumane acts ever recorded, but chemical warfare was one of the worst. Before World War I, battlefields were open places where men could fight to the death with their hands, swords, or other weapons and fight their opponent face to face. As technology advanced it caused for man to no longer have to

[11] Susan Grayzel, *The First World War: A Brief History with Documents* (Boston: Bedford/St. Martins, 2013), 126-127.

look into the eye of the enemy before they killed them. The creation of guns and artillery strikes made the battlefields more about machines. As World War I became a defensive war with the elaborate trench warfare that occurred after the battle of the Marne. As the Germany military officials saw the elaborate trenches being built they realized this war would be a long and gruesome conflict, unless they could find a way to surprise their enemies and tilt the playing field in their favor. This new lethal chemical weapon raised serious issues regarding their ethical place in warfare.[12]

Most citizens and soldiers found this new style of warfare to be very inhumane. This was because of the new technology of chemical weapons and how differently it killed individuals than other methods of war. Haber and German Military officials defended chemical weapons were just as humane as any other weapon of war. One German military expert compares chemical gases to bullets and artillery shells in *The Cologne Gazette* of Germany was published in *The London Times*. The article makes the argument of why should a chemical cloud of gas, which can be easily seen as it slowly floats along and can only be effective if the wind is blowing in the right direction, “be less humane than the invisible and unavoidable gas which bursts shells and with their splinters

[12] Freemantle, 1-15.

tears bodies into bloody shreds? Or the gas which flames up under one's feet from a secretly exploded mine and hurls thee and dozens of thy comrades in atoms towards the firmament?"[13]

Haber was very influential in not only creating Germany's chemical weapons but also, as a public face to defend the use of chemical weapons as humane. Haber gave many lectures and speeches on this subject during and after the war. During one lecture that was covered by *The London Times* in 1918, Haber argued that the use of chemical gases in the Great War came about as a result of the major stalemate caused by trench warfare. Germany was just looking for the best way to combat the stalemate; they found the solution when looking back at history. "Throughout history attempts have always been made to 'smoke out' the enemy when a war has become stationary. He asserted the reason why the use of hazardous chemicals is disliked by Germany's enemies is that the use of protections against gas calls for a special measure of discipline and intelligence in the simple soldier."[14] In past wars whenever the battle became a stalemate because the enemy had the higher ground or was in a well-protected fort, they would be "smoked out" or the land or fort around them would be burned and the smoke or

[13] "Through German Eyes. War of 'Claws and Teeth.' Gas Poisoners' Triumph," *London Times*, June 11, 1915.
[14] "Through German Eyes," *London Times*, April 19, 1918.

flames would force the enemy out into the open. As technology advanced, chemicals could now be used to "smoke out" the enemy. Instead of fire being used to "smoke out" the enemy Haber's chemical warfare division was using the newest technology to "smoke out" enemy soldiers with chemicals. Using chemicals to "smoke out" the enemy worked very well until countermeasures were created by allied forces to combat the lethal chemicals employed by Germany.[15]

The first lethal chemical gas attacks at the Second Battle of Ypres were merely experimental trials used to see if chemical weapons could be a viable option for new technology that would help Germany win the war. Going into the first chemical attack, Haber was very confident in his new weapon, so confident, he wanted Germany to employ it throughout battlefields all over Europe to provide a quick end to the war, but the German High Command did not listen. After the war and examining the results of the first chemical attacks, Haber further believed that the Germans could have won the war if the first gas attacks were not merely experiments as he wanted; not because of the physical effects that these chemical gases were causing but because of the great psychological factor it produced. *The New York Times* posted an article from the *Chicago Tribune* quoted Haber describing this during a lecture,

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[15] "Through German Eyes," *London Times,* April 19, 1918.

"Every new weapon is capable of winning a war. Every war is a war against the soul of the soldier, not the body. New weapons break his moral because they are something new, something he has not experienced, and therefore, something that he fears. We were used to shell fire. The Artillery did not do much harm to morale, but the smell of gas upset everybody."[16] Chemical gases caused great psychological effects on soldiers because they were constantly on the lookout for chemical gas attacks. Soldiers who were constantly on the lookout for chemical gases sacrificed their attentiveness and were left exposed.

Chemical gases were not the most effective weapon in World War I, compared to machine guns or artillery blasts; which is why it responsible for very low percentages of all deaths in World War I.[17] Yet, this new weapon provided many psychological effects for soldiers as Fritz Haber previously described. These effects would slow down the reaction times of soldiers because they would always have to be aware and on the look at for chemicals floating their way. It would also cause the men to have sleepless nights. The men were beginning to become accustomed to the artillery shells exploding and could sleep through these attacks, but no soldier could sleep through a gas attack. A soldier

[16] "Haber Says: Chemist Also Says Germans Could Have Won the War With Early Gas Attacks" *New York Times*. September 25, 1921.
[17] Joy et al, "Historical Aspects of Medical Defense," 88-90.

named H. Allen on the western Front wrote about this in an account from *Death's Men: Soldiers of the Great War* that men who had survived gas attacks often experienced psychological trauma similar to combat exposure. According to the account, "two or three alarms a night was common, gas shock was a frequent as shell shock".[18] This shows some of effects that gas were having on soldiers at the time. Even when there was no gas threat, any random soldier might have thought he smelt something which could cause havoc for every soldier as they felt forced to scramble for their lives. As soldiers were already worked to exhaustion, they needed every bit of sleep they could get, but the psychological effects of gas attacks were just too much, causing them to be very ineffective soldiers.

As Germany continued to use chemical gas attacks and to develop new chemicals under the lead of Haber, countermeasures were further developed by the allied forces to more effectively combat chemical gases used by Germany. The first countermeasures were nothing more than holding a rag over one's mouth and nose to make sure the chemicals would not enter the body. This still did not protect the soldiers' eyes, but by the middle of 1915 the British medical division of

[18] Dennis Winter, *Death's Men: Soldiers of the Great War*, (London: Allen Lane, 1978), 121.

war created the first form of gas mask. It was more of a helmet because it fully enclosed the soldiers head and only had a small window to see out of. These helmets were bulky and uncomfortable for the soldiers causing them to be very inefficient when wearing them. Once the British figured out that the German army was using chlorine as the chemical that was causing so much suffering, they developed created the "small box respirator" which would filter out any chemicals out of the air all from a simple piece of cotton. All these advancements to the countermeasures caused the German chemical warfare to become even more ineffective than it already was proving to be. These counter measures were also providing soldiers with some confidence against this new threat, this allowed them to begin to combat the psychological effects of chemical warfare.[19]

Even civilians had to learn countermeasures on how to protect themselves from chemical gases of the battlefields. Often times the winds would also carry the poison past the battlefield. It is reported that an estimated 5,200 civilians casualties were caused from chemical warfare.[20] This caused for the Red Cross to teach civilians how to stay safe from the dangers of chemical gases. An Article from the *London*

[19] Haber, *The Poisonous Cloud*, 46-47; James Webster, "The First Gas Regiment," *Journal of Industrial and Engineering Chemistry volume 11* (1919) 261-269.
[20] Haber, 248.

Times describes this fear and how it taught civilians to gas proof their houses. "Most rooms could be made gas-proof by sticking brown paper around the cracks of doors and windows and over the entrance to chimneys. Two wet blankets should be hung over the entrance door, one on the inside and one on the outside."[21] All civilians were worried about chemicals blowing past the battlefields and into the towns. Civilians were also worried that gas shells might be dropped on them just as zeppelins had dropped regular bombs over the British towns. This caused fear for all soldiers and civilians in Europe. It also caused fear for the allied forces who were aware of what the German chemical warfare was doing to the animals they were employing in the war efforts such as horses to move heavy materials and pull wagons of soldiers; dogs and pigeons were used as messengers. During chemical gas attacks these animals were defenseless because they would be tied up or in cages which caused the animals to suffer the same fate as soldiers who inhaled the lethal gases. When these animals were killed it would disrupt means of communication and logistics. Since the Great War was a war of attrition it meant that every resource was of vital importance and nothing

[21] "Gas Dangers In Raids," *London Times*, April 4, 1925.

should be wasted. This also created the need for gas masks for animals to help ensure their health in gas attacks.[22]

As the war in Europe raged on, the American government was becoming increasingly concerned of the chemical threats soldiers would face if they entered the war. The American military started creating and developing gas masks as early as the end of 1915 because "Certain Practices in the present European war have indicated the necessity for providing some equipment of this kind."[23] The design and the ability to supply gas masks if America were to become part of this European war would be left up to the Medial Department of the United States. Then a little more than a year later the Medical Department and Surgeon General Office created the Gas Defense Service to combat the rising use of chemical warfare in Europe, mainly the aggressive Germans. The Gas Defense Service showed its worth after America entered the war by allocating one million gas masks to the war effort. America took all the precautionary steps to help ensure their soldiers would not be affected by the German army's inhumane weapon.[24]

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[22] Joy et al, "Historical Aspects of Medical Defense," 91.
[23] Ireland et al. U.S. Army Medical Department. The Medical Department of the United States Army in the World War. Washington D. C. Government Printing Office, 1923. 27.
[24] Joy et al. "Historical Aspects of Medical Defense," 92-97; Hugh Slotten, "Humane Chemistry or Scientific Barbarism?" 475-490.

After the war was over and soldiers returned home the atrocities of chemical warfare began to spread. With over 5000 civilian casualties caused from chemicals during the war, the citizens of Europe were already outraged of the chemical warfare that took place. When the stories returned back to the United States there was a unified outlook by the majority of citizens of the world that the use of chemical weapons in war was inhumane. This caused several countries to create an official ban on chemical weapons. The Geneva Protocol did just this, but just as The Hague Conventions outlawed the use of chemical weapons in war, it did not deter countries from researching them at the start of World War II. Since then there have been many unsuccessful attempts to stop the production, stockpiling, and usage of chemical weapons.[25] In 1993 the Chemical Weapons Convention treaty started accepting signatures from countries that promised a complete ban on chemical weapons and their precursors. Today, close to 190 nations are fully following this treaty.[26]

As countries think about the sovereignty of their nation it causes them to think about how to best defend themselves in times of war, and because of this, war has and will continue to constantly evolve. In the

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[25] Victor Utgoff, *The Challenge of Chemical Weapons: An American Perspective* (New York. MacMillan. 1990), 14-21.
[26] "Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction." *United Nations Treaty Collection*. Accessed November 19, 2014.

Great War the German army understood that the type of massive conflict and the high stakes, which created so much strife that they were forced to recognize that warfare was changing. Haber concurred with the German army that the necessity of a quick resolution to the war was more humane in the long-term than continuing at its current rate of destruction by any means necessary. Germany's actions regarding chemical warfare in World War I were nothing more than evolving their style of fighting a war with new technology the enemy would not be ready for in order to succeed on the battlefield. The chemical warfare that took place during the Great War introduced what chemical gases could do when used on a large scale and the horrible effects it had on the human body. Chemical gases would attack the inside of the body causing for intense pain and the feeling of drowning which makes the act of dying an extremely traumatic event. Haber and other military experts defended Germany's use of gas as being equally humane compared to other weapons of war, but the world disagrees with his position, as measures continue to be implemented to ensure sure no individual has to suffer an inhumane death from chemical gases in the future.

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