‘Silenced Power’
Warfare Technology and the Changing Role of Sounds in Twentieth-Century Europe

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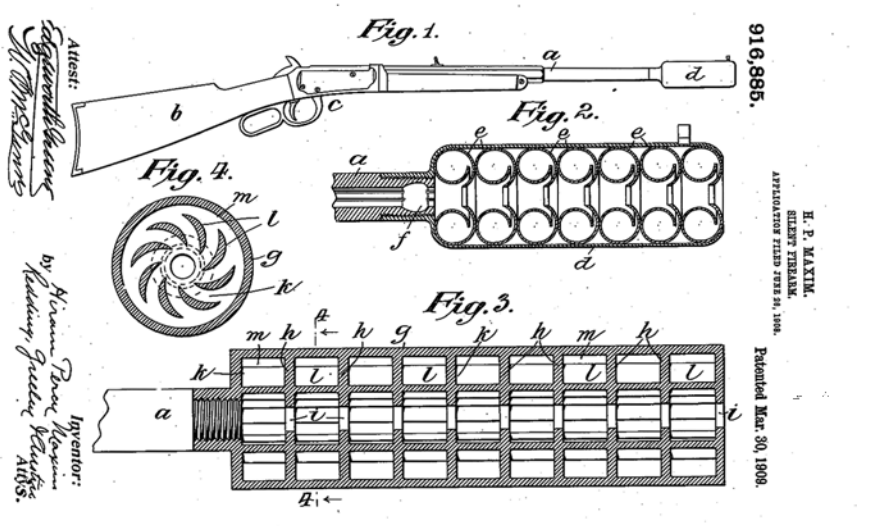
A few months before the opening of the 1936 Olympic Games in Berlin, a strange patent for a sound-absorbing device in firearms (*Schalldämpfer für Feuerwaffen*) was registered by the patent office of the Third Reich. The idea was quite simple, being based on a small tube-form device that was mounted on the muzzle of a firearm in order to absorb the firing sound of the weapon. The tube itself contained a series of parts made from different types of sound-absorbing materials. When the bullet was released from the muzzle, the sealed tube absorbed the gases in a way that considerably reduced the firing noise of the firearm. As a result of such a device, however, the muzzle velocity of the weapon was considerably decreased, significantly reducing the effective range of the weapon.[1]



Construction drawings of Hiram Percy Maxim’s ‘silent firearm’
(United States Patent Office, No. 916,885, patented March 30, 1909)

[1] For the patent of the silencer for firearms in Germany, see: Patentschau, in: *Akustische Zeitschrift* 3 (1938), p. 226.

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Interestingly enough, the idea of developing a device for reducing the firing noise of sealed-breech firearms did not originate in Germany. Already at the turn of the twentieth century, an independent inventor named Hiram Percy Maxim suggested ways for using 'sound-absorbing' devices, better known as 'silencers', for reducing the noise of firearms. Percy Maxim, the son of Hiram Stevens Maxim (1840–1916), the famous inventor of the automatic machine gun, used his expertise in valves and pipe engineering to suggest ways for diverting the firing gases of firearms so that the exploding sound could be reduced. Like many other inventors during the time of the Second Industrial Revolution in America, Percy Maxim, too, was motivated by the need to turn his invention into a commercial success. The key question was how to transform the idea of a silencer into a practical device that could be cheaply manufactured on a serial basis.

Maxim conducted experiments in sealed-breech firearms. By 1908 he had managed to build the prototype of a sound-absorbing device, mainly for use in longer firearms such as rifles. The growing popularity of his new invention and the emerging 'market' for such devices in America at that time enabled Maxim to establish a small factory in Hartford, Connecticut for the serial manufacture of silencers for different sorts of firearms. But authorities soon became suspicious, and the use of silencers in firearms was gradually prohibited in many places, becoming almost completely illegal in the United States during the 1930s. With no real business prospects for his new invention, Maxim eventually gave up the idea altogether and used his experience in firearms to develop mufflers for internal combustion engines in automobiles and motorcycles.[2]

Despite the fact that the use of silencers in firearms was against the law in many countries during the first half of the twentieth century, their worldwide popularity flourished in the interwar period and into the second half of the twentieth century. Silencers ignited the popular imagination as well. One of the best-known examples is the British secret service hero '007' (better known as James Bond) from Ian Flemming's spy novels of the early 1950s to the late 1980s. The image of James Bond wearing a suit and holding a hi-tech pistol mounted with a silencer became one of the most popular 'acoustic images' of weaponry during the Cold War. At a time when war was mainly visualized in the imagination or localized in post-colonial and limited armed conflicts mostly in the Far and the Middle East, it is probably no coincidence that the image of 'silencing' firearms perfectly suited the semantics of 'coldness' which dominated the cultural vocabulary of the Cold War.

[2] For other inventions by Percy Maxim concerning noise reduction at the workplace, see: Emily Thompson, *The Soundscape of Modernity. Architectural Acoustic and the Culture of Listening in America*, 1900–1933, Cambridge 2004, p. 222, fn. 156. Cf. Emily Thompson, Shaping the Sound of Modernity, in: Mark M. Smith (ed.), *Hearing History. A Reader*, Athens 2004, pp. 331-363.

It seems to me, however, that the unusual popularity of the silencer in capturing the visual perception of weaponry in the twentieth century goes well beyond the popular images of literary heroes and film stars such as James Bond. Moreover, the effect of the silencer was not just limited to the visual perception of firearms in modern times but created a new juxtaposition between sight and sound, between seeing and hearing weapons in the twentieth century. In a polemic manner, we can further argue that the ability of the silencer to reduce the sound of firearms even changed the way weapons were used. This process by which controlling and reducing the sounds of weapons manipulated the known juxtaposition between sounds and their immediate context in a way that redefined the boundaries between the role of weapons and their actual employment during the first half of the twentieth century I call silenced power. In considering the role of silenced power, it makes sense to ask in what ways the technological ability to control the sounds of weapons created a new form of auditory perception of weaponry.

In order to answer this question, I will examine first the sonic epistemology of silenced power, detaching the sound of weapons from their wartime context. To understand the role of silenced power on an historical level, we also need to observe the long-term tradition of battlefield noise and its climax during the First World War. The turmoil of the First World War is in this sense a watershed for observing the mass introduction of silenced power and its negative effects during the first half of the twentieth century. This can be seen in the case of gas warfare and its echo during the interwar period as well as in its later employment as a means of mass extermination during the Nazi era in Germany. The traumatic memory of gas warfare as a form of silenced power will also allow me to investigate to what extent silenced power during the first half of the twentieth century was distinct from the sensory experience of weaponry during the Cold War. As a war that from its very outset was predominated by imaginary forces, it was mostly the visual image of the blinding light and the blast effects of the atomic explosion that constituted the sensory perception of weaponry after 1945.

1. War and 'Silenced Power'

In his well-known study on soundscapes, R. Murray Schafer vividly illustrated to what extent the development of electro-acoustic technology enabled the dissociation of sound from its origins, detaching the place a sound is made from the place it is heard and creating new modes of auditory perception from the late nineteenth century on. Schafer termed this process 'schizophonia'.[3] The semantic similarities between Schafer's term and the more popular term 'schizophrenia' are obvious, the latter describing an acute mental disorder in which the relations between thought, emotion and behaviour are severely damaged.

The relation was acknowledged by Schafer himself. By using the old Greek prefix 'schizo' he sought to emphasize the splitting of sound and hearing in the age of modern technology. In addition to Schafer's technical use of the term, however, we cannot ignore the broader meaning of 'schizophonia' in reference to 'schizophrenia' as a metaphor for describing a human state of crisis. Continuing this line of thought, it seems that the challenges imposed by modern technology on the cultural process of hearing in Western civilization have tended to be observed mainly through the epistemology of crisis. This fact is even more important for the cultural study of sound in relation to war and warfare technology. Quite surprisingly, the epistemology of crisis regarding sound and technology has seemed to continue into the present. Despite suggesting original ways for observing the role of sound in times of war, newer research still tends to describe the interplay between sound and power mainly in what was referred to by Steve Goodman as 'affective tonality' and the 'politics of frequency'.[4]

Considering the fact that there are no 'noisy' wars but, rather, 'noisy' weapons to be used in wars, we may assume that there is a clear difference between war and warfare technology. The broader notion of war as an historical crisis, however, has given rise to serious hermeneutical questions concerning our ability to observe wartime sounds as a means to explore the sonic history of weapons and their use. This becomes even more complex in relation to the history and memory of the two world wars in Europe. The turmoil of the First World War as the seminal catastrophe of the twentieth century and the long-term disastrous impact of the Second World War as a total war made it impossible to observe the sonic history of warfare technology without considering the mass destruction and the human suffering that modern warfare technology has caused. From the standpoint of sonic history, the sounds of warfare technology could no longer be merely analyzed within the framework of their sonic operation, but were considered as being indicative of the maladies of the twentieth century as such.

The tendency to observe the sounds of warfare technology primarily as traumatic symptoms of a broader crisis of modernity seems most prominent in the German-speaking discourse. The long-term shadows of the Third Reich in Germany and the crimes committed by the Nazi Regime seem to overshadow any possibility of observing the sonic history of war in Germany prior to 1933 without falling into an historical narrative of negative teleology. Consequently, scholars who wish to observe the sonic history of war in Germany during the early twentieth century might find themselves trapped in the need

[3] R. Murray Schafer, *The Soundscape. Our Sonic Environment and the Tuning of the World*, Rochester 1977, 2nd ed. 1994, p. 90.

[4] Steve Goodman, *Sonic Warfare. Sound, Affect and the Ecology of Fear*, Cambridge 2010.

to uncover the future maladies of National Socialism and the Third Reich in the early sonic experiences in the trenches of the 'Great War' and the crisis years of the Weimar Republic. Seen from this angle, it is probably no coincidence that the writings of the Italian futurist movement and Ernst Jünger are mainly regarded as prime historical sources for demonstrating the wartime sonic experiences of the First World War.[5]

Let us not forget, however, that it is not merely the loudness of modern warfare technology but, rather, the dynamic role these sounds and noises have played which established them as sonic events. Moreover, due to the dissipated nature of sound, it is quite difficult to reconstruct the wartime sonic context from the explanatory context of the interwar period. Taking this argument one step further, we may assume that the starting point for observing the sonic history of weapons was not simply in conducting a typology of sounds of modern warfare, but in the ability to piece together these sounds within the explanatory context of the battle itself. In short, it is not the sounds themselves but the ability to interweave them within the broader soundscape of battle that gives the sounds of war their historical existence even after the battle. From this perspective we may argue that the technological ability to control the sounds of weapons, as in the case of the silencer, was not only limited to the sonic imprint of weaponry itself and its sonic memory but actively undermined the long-term interplay between 'sonic text' and 'sonic context' in times of war. As a result, new modes of operating weapons were developed which broadly changed the role of weapons and their use both for warfare and for civil purposes.

Returning to our opening example of the 'silencer' and its use with firearms, it seems to me that there are some similarities between the sonic epistemology of the silencer and the gradual dissolution of the long-term sonic tradition of firearms based upon their loudness, both in times of war and in times of peace. Moreover, in regard to the sonic function of the silencer, it seems that the need to obscure the firing sound of the weapon from both the victim and the environment denotes a crisis in the idea of sound and power which existed in Europe since early modern times. As Schafer has already pointed out, it is unlikely to imagine cannons that do not make any sound.[6] This sonic juxtaposition between the evolution of firearms and the increasing loudness of their operation created a long-term sonic tradition, which I refer to as 'sounded power', in which the louder the perceived sound of the weapon,

[5] Julia Encke, *Augenblicke der Gefahr. Der Krieg und die Sinne*, Munich 2006; Helmut Lethen, „Knall an sich". Das Ohr als Einbruchstelle des Traumas, in: Inka Mülder-Bach (ed.), *Modernität und Trauma. Beiträge zum Zeitenbruch des Ersten Weltkrieges*, Vienna 2000, pp. 192-210.

[6] See R. Murray Schafer, *Klang und Krach. Eine Kulturgeschichte des Hörens*, Frankfurt a.M. 1988, p. 106. For some general notes on noise and power see Jacques Attali, *Noise. The Political Economy of Music*, Manchester 1985, 10th ed. Minneapolis 2009.

the more powerful the weapon was considered. Why, then, was there a need to obscure the sounds of weapons? How did this shift in meaning occur?

Regarding the sonic tradition of sounded power, it seems that the need to obscure the sound of firearms can be explained by the inappropriateness of using weapons that no longer make any sound. Thus, the answer may lie in the context or, to be more precise, in the time and place the weapon is employed and heard.

In short, we see that in times and places where firearms are normally used, there is no need to hide their sounds. In contrast, the need to hide their sounds occurs mostly when they are being employed in times and places where they are unlikely to be used. In this sense we may further argue that the silencing of weapons undermined their long-term tradition of sounded power on the battlefield, thus breaking the sonic epistemology of their use. In so doing, not only their sound was changed but their actual function was shifted as well – from a 'legitimate' weapon (*Waffe*) to be employed on the battlefield to an 'instrument of murder' (*Mordinstrument*) to be used discretely and, often, illegally. This irresolvable sonic tension between the sonic epistemology of weapons and the sonic epistemology of 'instruments of murder' seems to be the key to understanding and explaining the role of 'silenced power' and its profound effects upon the sonic tradition of 'sounded power' in the first half of the twentieth century.

The evolution of 'silenced power' as a way of undermining the long-term sonic tradition of 'sounded power' can also explain why the use of a silencer for firearms was strictly prohibited in many countries throughout the world during the 1930s. Since loud firing sounds became a synonym for perceiving weapons as powerful, the ability to manipulate the sounds of the weapon blurred the known sonic distinctions between the legitimate and illegitimate deployment of weapons. Sound became a marker for distinguishing between the 'fair' and 'unfair' use of weapons. However, the ability to 'break the rules' by changing the sounds of weapons and thus changing the immediate context of their use could no longer be ignored, because now it was technically possible. In this sense, the First World War is a kind of watershed in the evolution of silenced power and its future use in the twentieth century.

2. War and 'Sounded Power'

Since the introduction of gunpowder in Europe, we can easily observe a parallel between the evolution of warfare and the increasing loudness of the battlefield. The ability to employ technology for increasing the destructive power of weapons significantly revolutionized the auditory perception of battle. This was mainly because warfare technology extended the battle beyond the scope of physical power, thus expanding violent engagement beyond the experience

of the immediate senses. Warfare technology and its employment on the battlefield gradually became the cornerstone for understanding the sensory experience of war.[7]

Sound has been important in framing the sensory experience of battles ever since ancient times. Battle cries, war drums, horns and trumpets, other loud sounds and voices played a crucial role in intensifying the subjective experience of battle. For the aggressor, these sounds were mostly perceived as a force of encouragement. For the defender they served as an acoustic signal of impending attack. In this sense, sound became a reliable parameter in evaluating the battle situation. In early modern times, however, this constellation changed fundamentally. With the introduction of gunpowder in Europe, sound was no longer a subjective qualification to be used for intensifying the subjective experience of the battle, but truly became an objective output resulting from the use of explosives in weapons. The thermodynamics of warfare with its new and louder sounds resembled a new sonic epistemology in which the louder the sound of the explosion became, the stronger the perceived fire power of the weapon. Considering the fact that, at least during early modern times, louder was not necessarily better, the newly formulated parallel between intensity of sound and military power deeply changed the role of sound and its meaning in the battlefield in modern times.

Since the great leap in the evolution of warfare technology during the late nineteenth century we can also observe broader ties between sound and the experience of battle. Louder sounds were now linked to much more effective and rapid firepower. The continuous employment of large-scale field artillery in a 'Napoleonic manner,' concentrating firepower on the battlefield, became one of the best-known examples of the attempt to achieve a stronger and more rapid firepower in armed conflicts throughout Europe prior to the outbreak of the First World War. In this context, the introduction of automatic breech-loading systems for guns was a further contribution to the juxtaposition of sound and power in the age of firearms. The ability to load weapons faster than before increased the rate of fire and its sounds. The louder sound created by faster loading systems evoked a significant change in the sonic perception of the battlefield, not only in space but in time as well.

This sonification of warfare experience during the second half of the nineteenth century was not limited to artillery; it also affected the individual soldier. In this sense it was the American Civil War (1861–65) that became an enormous testing ground for employing new warfare technologies.[8] The intro-

[7] For a general overview of warfare technology and its influence on the senses from ancient times to the present, see: Michael Salewski, Lärm, Monotonie und Dynamik in den Weltkriegen des 20. Jahrhunderts, in: *Historische Mitteilungen* 22 (2009), pp. 189-204.

[8] Bernard and Fawn M. Brodie, *From Crossbow to H-Bomb. The Evolution of the Weapons and Tactics of Warfare*, Bloomington 1973, p. 133.

duction of the Gatling machine gun during the Civil War, for instance, led to a further individualization of the sonic experience of warfare on the battlefield. But this experience was not limited to the 'New World'. The outbreak of the Crimean War (1853–56), almost parallel to the American Civil War, was in this sense an even earlier expanding of the sonic experience to new war theatres based on the sonic epistemology of 'the louder, the better'. Moreover, if the sonic experience of the American Civil War was beyond the earshot of Europeans, the Crimean War was different. The immediate involvement of the European Great Powers in the conflict on the Crimean peninsula brought deep changes, Westernizing the 'Eastern question' and thus altering the political map of Western Europe. The introduction of seagoing ironclad ships and the extensive use of naval and coastal artillery in both wars was a turning point for the evolution of both land and naval warfare between the Great Powers.[9]

The gradual disintegration of the Ottoman and Russian Empires after the Crimean War also played a role in igniting the German and Italian wars of unification. The equation between war and national self-determination in Europe during the late nineteenth century was not limited to politics, however, but deeply influenced the link between increasing loudness on the battlefield and the sense of superiority among the Great Powers. Paradoxically, the employment of mass armies throughout Europe in the late nineteenth century even further individualized the sonic experience of modern battle. The Prussian wars of unification are in this respect a good example for showing to what extent the individualization of warfare and its sonic experience almost reached the level of the individual soldier. The introduction and large-scale employment of the 'needle firing gun' gave Prussian forces a remarkable superiority on the battlefield by concentrating significant firepower in the hands of an individual soldier. The idea of the needle gun itself was not new, but was improved upon in Germany following the Crimean War.[10] The extensive deployment of needle rifles by the Prussian army did not merely affect their superiority on the battlefield, but further elaborated the sonic ties between the loudness of sounds and military power. The decisive battles at Sadowa (near Königgrätz, 1867) during the Austro-Prussian War and the battle of Sedan (1870) against the French army during the Franco-Prussian War (1870–71) can both be seen as remarkable turning points in the individualization of modern warfare and the intensification of its sounds. In both cases, sounded power on the battlefield transformed itself into political 'loudness' in a way that deeply changed the political map of Europe in the last third of the nineteenth century. Both of these examples also reveal that, in an age of

[9] Robert K. Massie, *Dreadnought. Britain, Germany and the Coming of the Great War*, New York 1991, pp. 386-388. Cf. Andrew D. Lambert, *The Crimean War. British Grand Strategy Against Russia, 1853–1856*, Manchester 1990, pp. 30-32.

[10] Brodie, *From Crossbow to H-Bomb* (fn. 8), p. 136.

mass employment of rifles that could be loaded quickly and fired more rapidly and accurately, loud noise was not just another sonic output of the battlefield but also resembled the state monopolization of the 'means of violence'.

Moreover, in the case of needle rifles and the automatic breech-loading system, the increase of rapid-fire weapons meant an acceleration of military and political time. Rapid fire was thus not merely a rapid sonic experience 'under fire' but also paved the way for swift and dynamic victory. It is therefore probably no coincidence that with the evolution of rapid fire during the late nineteenth century, loud sounds and swift movement on the battlefield laid the strategic basis for observing the battlefield through 'firepower' (*Feuer*) and 'manoeuvrability' (*Bewegung*).[11] The inability of the belligerent countries in August 1914 to transform their immense firepower into decisive manoeuvrability was a key cause of the catastrophic course of the First World War. This also characterized the sonic experience of the First World War, which was mostly based on passive hearing and resulted from military stagnation at the front.[12]

In contrast to many other conflicts in Europe prior to the First World War, the roar of the guns in August 1914 should be seen not merely as a conflict between armies but first and foremost as a conflict between states and societies. Millions of soldiers from throughout the world were involved in a colossal armed conflict that ran, at least along the western front, from the Swiss border to the Belgian coastline, and had no choice but to dig into the trenches.[13] And yet the amplification of sounds on the battlefields of the First World War was different not only in terms of space, but occurred within a comparatively short time period as well. Never before had so many and so many types of artillery batteries been employed so extensively within a comparatively limited frontline area. Both at the eastern and at the western fronts, sound played a crucial role in defining the actual borders of the battlefield. Like in many armed conflicts prior to the First World War, it was mostly artillery that dominated the sonic experience of the war. Since mass battles also demanded mass deployment of artillery, new artillery tactics were developed in the early stages of the war. The introduction of the 'barrage' tactic, a method for covering advancing infantry by massive artillery fire, is one of the most well-known lessons learned from the Franco-Prussian War.[14]

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[11] For the juxtaposition between firepower and manoeuvrability in Germany during the late nineteenth century, see e.g. Dennis E. Showalter, *Railroads and Rifles. Soldiers, Technology and the Unification of Germany*, Hamden 1975.

[12] Encke, *Augenblicke der Gefahr* (fn. 5), pp. 113-115.

[13] Brodie, *From Crossbow to H-Bomb* (fn. 8), p. 190.

[14] Bruce Gudmunson, *On Artillery*, Westport 1993, pp. 2-4.

Moreover, the development of indirect firing techniques during the last decades of the nineteenth century significantly influenced the sonic course of the war, most of the artillery used in the war being indirect fire such as heavy guns and mortars. This extensive use of indirect and rapid fire had a far-reaching influence on the sonic experience of many who took part in the war. The tension between visual and sonic perception for those who were 'under fire' was greatly intensified. In contrast to direct fire, in the age of indirect fire it was no longer possible to easily spot the sources of discharge. The concentration of fire power now became closely tied to mathematical calculations and much less to visual or other sensory contact with the target. The extensive use of improved breech-loading systems both in field artillery and in small arms further enhanced the juxtaposition between loud sound and rapid fire. This was also the case in the use of machine guns at the front. The combination between barbed-wire fences and machine guns scattered along the front line created a new and lethal juxtaposition between 'firepower' and manoeuvrability, causing huge casualties for all the warring nations.[15]

Yet if we carefully observe the sonic history of the First World War, we may still talk about sounds that, despite their loudness and rapidness, correspond to the traditional sonic epistemology of sounded power in terms of their form and content. This concept of 'the louder, the better' was evident in the First World War, unleashing the industrial advances of the late nineteenth century as a force of destruction on the battlefield. The extensive reliance on warfare technology at the front during the First World War also explains why, at least at the western front, there was still a clear distinction between the front line and the hinterland despite mass battles and extensive destruction. This fact was not limited to the actual battle and the deployment of warfare technology, but also informed the sonic division between front line and hinterland in many belligerent countries during the war. At least from a sonic perspective, the First World War, for all its objective loudness, mainly continued the sonic epistemology of the 'long nineteenth century'. But the main question still remains unresolved. If the First World War and its attendant sounds prolonged the age-old tradition of sounded power, why was it nevertheless a watershed event in the establishment of silenced power during the twentieth century?

The reliance on warfare technology made it necessary to employ new weapons if battles were to be won, either weapons never used before or ones considered controversial at the time. A unique example of this is the introduction of gas warfare during the First World War. Gas warfare could not change the course of the war, but its long-term negative influence changed the course of history during the first half of the twentieth century.

[15] Dan Diner, *Das Jahrhundert verstehen. Eine universalhistorische Deutung*, Munich 2000, p. 30.

3. Gas Warfare as a 'Silenced Power'

In the early evening hours of April 22, 1915, French and Algerian soldiers at the front line in Ypres noticed greenish-white fumes approaching them. The same strange cloud took on a different colour towards sunset. The French and Algerian soldiers observing the situation thought that the fume was changing direction and heading back toward the German trenches – but this was only an illusion. Although the wind had pushed the fumes back for a moment, they were still approaching the French front line. Many of the French and Algerian soldiers were actually quite happy to see the approaching cloud. They thought it was another smoke shelling that would hide them from continuous German artillery fire. After a while, however, the strong and unpleasant odour of detergent could be detected in the air, and suddenly it was clear what the purpose of the cloud was. Many of the soldiers ran out of the trenches in panic, trying to escape the approaching fumes. The German soldiers, observing the situation from the safety of their trenches, could see how the French and Algerian soldiers ran away, many of them holding their throats in the attempt to breathe, crying voicelessly for help.[16]

This horror scenario of one of the first known gas attacks on the western front was repeated many times in the First World War. Shortly after this gas attack in Ypres, the other belligerent countries as well began to use poisonous gas as a weapon. Although the results were horrifying, it did not change the course of the war. Like the aeroplane, the submarine and many other war technologies intensively developed during the war, it failed to bring decisive victory in a war that, from its very onset, was fought with the military mindset of yesterday. Despite the heavy casualties that gas warfare inflicted on both sides, it was still considered a marginal phenomenon. Its cultural long-term significance, however, in establishing the negative experience of modern warfare and its memory during the twentieth century cannot be underestimated. Moreover, it seems that the 'silenced power' of gas warfare during the First World War played a crucial role in spreading the trauma far beyond its actual influence on the battlefield.

Gas warfare and the silencer are striking examples of how their silenced operation and their quasi 'civilized', 'clean' manner of attack made them seem so horrible in comparison to 'conventional' weapons such as artillery and small arms. In addition, the ability of the gas to hit the respiratory system without leaving any visible trace, as in the case of injury by gunfire, made it seem even more terrifying within the dominant tradition of sounded power. Dying as a result of suffocation also contradicted the traditional and long-standing tradi-

[16] Olaf Groehler, *Der lautlose Tod*, (East) Berlin 1978, 3rd, revised ed. 1984, p. 43. Cf. Encke, *Augenblicke der Gefahr* (fn. 5), pp. 197-199.

tion of heroism and chivalry in battle which was still dominant in the culture of sounded power among many warring parties during the First World War. The idea of being chocked to death by gas without being able to breathe seemed a horrible and dreadful fate. As one British officer on the western front put it: 'A casualty from gunfire may be dying from his wounds, but they do not give him the sensation that his life is being strangled out of him.'[17]

A group of German soldiers with gas masks and hand grenades. A peculiar tension is inherent in the picture. Group photos normally preserve individual and social memories, but in this case the masks depersonalize the individuals and would seem to prevent any memories.
(Wehrgeschichtliches Museum Rastatt)

However, the different sensory experience of war that gas warfare evoked and the ability to breakdown the sonic context of its use were not only limited to questions of popular image and the barbarization of modern warfare; they also initiated a protracted discussion about the various forms of dying in battle. Both legal and political discourses prior to and after the First World War were deeply affected by the theoretical and practical significance of gas warfare in any future armed conflict in Europe. At the first Hague Conference, the American delegation led by the famous American naval expert Alfred Thayer Mahan (1840–1914) argued that there was no reason for signing an agreement to limit gas warfare. To support their argument, the American delegation stated that one could not see any real difference between a death caused by poison-

[17] Henry Harris, To Serve Mankind in Peace and the Fatherland in War. The Case of Fritz Haber, in: *German History* 10 (1992), pp. 24-38, here p. 33.

ous gas and a death caused by drowning on a sinking ship. Without delving more deeply into the morbid attempt to distinguish between different forms of dying on the battlefield, it is apparent that the hermeneutical question raised by different forms of soldiers' death not only perpetuated the age-old tradition of 'just war' theories that were rediscovered in Europe in the late nineteenth century, but was also deeply rooted in the new possibilities suggested by new war technologies.

Sounded and silenced warfare. A German battery, March 1918
(Library of Contemporary History of the Württemberg State Library in Stuttgart, Special Collections, WK1: 177)

Yet if we observe the unique negative role of gas warfare and the way it challenged the tradition of sounded power on the battlefield, we can conclude that the large-scale use of poisonous gas during the First World War created, by dint of its silenced power, a new distinction between 'civil' and 'military' forms of war-related death. From the sonic perspective, this distinction is not only derived from the fact that gas warfare was considered soundless, but from the fact that a soundless weapon was being used within a sonic environment which from its outset was predominated by the noise of firearms and explosions. The dissonance between the soundless use of gas and the loudness of the battlefield created the image of gas warfare as a weapon which 'broke' the sonic rules of war. This, however, was a question dealt with in the interwar period. For the soldiers, at least on the western front, the silenced power of poisonous

gas was not merely a theoretical construct; it also led to a unique auditory perception, in which attempts were made to maintain the sonic epistemology of sounded power by trying to distinguish between the sound of gas projectiles and 'normal' projectiles.

One of the unresolved problems of employing gas warfare during the First World War was the question of how to spread the gas effectively, in a way that would target only the enemy. The inability to control a wind-borne cloud of poisonous gas raised difficult operative challenges. One of the first techniques, also employed in the chlorine-gas attack at Ypres, was the use of gas cylinders. This method proved quite ineffective, however, since it was fully dependant on the direction of the wind, which could suddenly change and reverse the cloud of gas. A more effective method was the use of shells with gas projectiles that were fired by artillery and supposed to explode over the enemy target. These gas projectiles produced a different sonic imprint than normal high-explosive projectiles, and were often taken by those in the trenches as the sign of an impending gas attack.

But the warring parties had different ideas about how to use gas warfare. Whereas the Germans still believed in the future of gas warfare and its ability to alter the course of the war, the British and the French soon acknowledged its limited effect and were mainly concerned with its psychological impact. In contrast to German gas attacks, which still had strategic aims, the Entente powers used gas warfare on a random basis. Thus, they would occasionally mix gas projectiles with normal high-explosive artillery shells, hoping to induce panic among German soldiers and a sense of permanent anxiety. The frequent 'gas alarms' on the German side as a result of this method forced many soldiers to keep their gas masks on for extended periods, while wearing heavy, uncomfortable gas-resistant coats in constant anticipation of an enemy attack.[18]

4. Loud Memories of a Soundless Weapon

The establishment of gas warfare's negative silenced power as a weapon that broke the 'sonic rules' of war by manipulating its sonic imprint lingered even after the end of the First World War. Although its manufacture and use for military purposes were explicitly prohibited in the peace settlements after the war, and later set down in international law in the Geneva Protocol of 1925, its negative legacy continued during the international crisis of the interwar period, albeit in a different way. In the postwar era, the memories of gas warfare were now part of the collective trauma of modern war and a warning for the future.

[18] Dieter Martinetz, *Der Gaskrieg 1914–1918. Entwicklung, Herstellung und Einsatz chemischer Kampfstoffe*, Munich 1998, p. 68.

From the perspective of silenced power, it is evident that the negative memories of gas warfare existed almost separately from actual wartime experience, becoming a kind of condensed metaphor for the maladies of the era. Interestingly enough, it was the Germans, having initiated the large-scale deployment of poisonous gas in the First World War, who most feared retaliation in a future armed conflict in Europe. As in the case of the aeroplane, though limited in influence, there was no doubt about its future role in any future armed conflict. This collective anxiety was further exacerbated by the fact that, after the war, it was more difficult to convey gas warfare's true destructiveness. The fear of poisonous gas and the inability to visualize its real impact in the interwar period, its abstractness and its silent operation, made it one of the most common negative symbols for the hazards and horrors of war in the Weimar Republic.

The historical constellation of the Weimar Republic – between two world wars and three completely different types of political regimes existing in Germany within less than a half century – poses serious epistemological questions for our ability to view these years as an historical period unique in its own right. Moreover, the dissolution of the old Eastern European multinational empires and, consequently, the disintegration of the traditional Western European concept of the nation-state after the First World War make it almost impossible to observe the interwar period within the framework of a nation-state. This epistemological difficulty also raises a serious challenge to our ability to observe sound and its meaning within the traditional framework of the nation-state. Yet it seems to me that it is exactly the universal negativity of gas warfare during the First World War and its long-term memories that necessitate further discussion about the role of gas and its silenced power played in civil sonic environments, such as the Weimar Republic, which were also predominated by the cultural role of loudness and its avoidance. Although the 'Weimar years' possess an historical singularity, they were still strongly determined by the memories of the Great War and fears of another future war. This specificity of the Weimar period as a 'between-the-wars' historical period meant that the memories of a silenced power from the last war were incorporated into the sense of crisis during the interwar period. In contrast, however, to the immediate role of poisonous gas during the war, its silenced power acquired a broader meaning in the interwar period with respect to the hopes and concerns of the era. A good example of this is the well-known trilogy of plays *Gas* (1917–20) by expressionist playwright Georg Kaiser (1878–1945), which combined the negative symbolic meaning of poisonous gas with the maladies of modern society in interwar Germany.

Yet the invisible and silenced power of gas also posed serious difficulties in presenting and preserving its negative memories during the Weimar period. This fact is understandable, since gas was a weapon that possessed neither a

visual nor a sonic imprint. One of the most widespread methods for making the negative, silenced power of the gas 'audible' again in the postwar era was the medium of radio. The introduction of commercial radio broadcasting in Germany in October 1923 established new opportunities for presenting the dissipating memories of gas warfare in an audible form. The airwaves became a symbolic agent for spreading a non-visual airborne message about gas warfare. Paradoxically, the radio with its intrinsic 'blindness' made the memories of gas warfare in the Weimar Republic even more graphic than before.

To make the invisible memories of gas warfare visible again, the visual effects of gas were brought into focus. Since gas warfare itself, however, had no visual singularity, the visualization process soon shifted to representations of defending against it. This had started during the war. Many photos emphasized the 'spooky' and 'outer-space' look that was achieved by wearing gas masks and gas-resistant coats. The image of marching infantry or cavalry soldiers, their horses, too, wearing gas masks and looking like alien creatures, became a widespread motif.

(from: Die Werag. Westdeutschlands Heimat-Funkzeitschrift, Ausgabe A, 8 [1933] H. 39, September 24, 1933, p. 1)

The possibility of rearranging the sonic memories of gas warfare and its silenced power with visual metaphors of the interwar period was later used, during the Nazi period in Germany, to evoke panic and anxiety. One of the most interesting examples is an early attempt to employ the distortion effect – a human voice spoken through a gas mask – in order to create a sense of fear and alienation. The image of two radio anchors wearing gas masks while speaking 'on air', titled 'creatures at the microphone' (*Ungeheuer vor dem Mikrofon*), is a vivid example.

5. Warfare 'Silenced'

The collapse of the Weimar Republic and the rise of the Nazis to power in January 1933 intensified the long-term negative memories of the 'silenced power' of gas warfare and gave the division between gas, weaponry and sound a brand-new political meaning. The new regime exploited the public fear of gas warfare to mobilize German society in supporting the idea of a National Socialist *Volksgemeinschaft*. Thus, the widespread anxiety toward gas warfare was gradually incorporated in the preparations for a new war in Germany in the 1930s. Extensive public campaigns for training German citizens how to behave in the event of enemy gas attacks, and special magazines on the topic such as *Gas and Air Raid Defence* (*Gasschutz und Luftschutz*) are just a few examples.

Although the menace of gas still lingered in Germany prior to the outbreak of the Second World War, its actual, quite limited influence was largely disregarded. Moreover, the political use of these long-term memories almost became a personal issue in Europe of the early 1930s. In a most tragic way, the collective fear of many Europeans about the gathering storm clouds in Europe were gradually incorporated in the personal fear and anxiety of many individuals who, following the rise of the National Socialism, could no longer find a home in Germany. Fritz Haber, considered by many to be a pioneer in the scientific development of poisonous gas for wartime use during the First World War in Germany, is one well-known example. As a scientist of world renown and a recipient of the Nobel Prize in Chemistry, Haber was invited to the University of Cambridge in 1933. With the rise of National Socialism, Germany was no longer a safe place for scientists like Haber, who, in spite of their seminal contributions to the German war effort during the First World War, as Jews were unable to flee the Nazi persecution. Haber had hoped to continue his work in Britain, but had problems clarifying his emigration status from Nazi Germany. Disappointed and seriously ill, Haber, like many others forced to leave Germany, eventually became a refugee. He died one year later as an exile in Switzerland.[19]

From the very start, Nazi ideology and its will to establish a 'new order' made no bones about the difference between the previous war and the coming

one. Paradoxically, the outbreak of the Second World War in September 1939 almost fully ignored the role of poisonous gas and silenced power in modern warfare. With the beginning of hostilities in the Second World War, the fear of another gas war could still be felt throughout Europe. But the more the war progressed, the less these fears became. And yet gas masks became one of the most dominant visual markers in the early phases of the Second World War. Millions of soldiers and civilians throughout Europe carrying small cardboard boxes with gas masks that were almost never used became a visual metaphor for the negative persistence of long-term memories of silenced power from the previous war.

Moreover, the sonic turn of gas warfare under National Socialism further shifted the use of poisonous gas – from undermining the age-old tradition of sounded power on the battlefield to a silenced power and instrument of murder used on civilian populations. This would become a horrible reality only a few years later. The *völkisch* ideology of National Socialism with its pseudo-scientific origins paved the way for employing the silenced power of poisonous gas as a means of mass extermination. What began in the Weimar Republic as extremist propaganda for 'warning' German society about its 'poisonous elements' later developed into a murderous practice under Nazi-occupied Europe. Thus, although the sounded power of warfare technology still continued to dominate the battlefields and the armed conflicts after the First World War,[20] the atrocities of silenced power and the sonic epistemology that developed during the early twentieth century could no longer be ignored, even after 1945.

6. 'Silenced Power' and 'Cold Wars'

The Cold War historian John Lewis Gaddis once pointed out that for many people on both sides of the 'Iron Curtain' it was the image of a nuclear blast that most defined the sensory image of weaponry during the early stages of the Cold War. This experience was not limited to the well-known image of the mushroom cloud, but referred to other visual effects as well. The immense destructive power generated by a nuclear blast was graphically illustrated by the first American thermonuclear experiment performed on the Eniwetok Atoll in the Pacific on November 1, 1952. For many of those who observed the test, it was the birds incinerated in mid-flight that became a fearful visual reminder

[19] Margit Szöllösi-Janze, *Fritz Haber. 1868–1934. Eine Biographie*, Munich 1998, pp. 679-681.

[20] On the sounds of the Second World War in the German experience, see Yaron Jean, *Noises of Modernity. Hearing Experiences in Germany 1914–1945*, Tel Aviv 2011, pp. 165-167 (in Hebrew). Cf. Carolyn Jade Birdsall, Between Noise and Silence. Sound, Technology and Urban Space during Nazi Germany, Ph.D. Dissertation, University of Amsterdam 2010, especially chapter 3.

of the potential horrors of the coming era. This same attempt to conceive the inconceivable by focusing on the visual effects was shared by those who observed the explosion of the first Soviet H-bomb on August 12, 1953 in Kazakhstan.[21]

Though the Second World War revealed the devastating effect of nuclear weapons on human victims, for many it was the image of dead birds with singed feathers many thousands of miles away that symbolized the ability of man-made weapons to wreak havoc upon nature. In point of fact, the lethal effect of a nuclear blast, its heat and 'blinding' white light, did not merely sow the seeds of fear but profoundly shifted the sensory perception of weaponry during the heyday of 'atomic diplomacy' following the Second World War. These visual images of the nuclear era did not only affect those directly involved in these nuclear testing programs, but became a popular image of the nuclear age on both sides of the Iron Curtain. The English translation of the famous book *Brighter than a Thousand Suns. The Moral and Political History of the Atomic Scientists* (1958), written by Robert Jungk during the early 1950s, is a good example of this. Jungk, who had fled Nazi Germany in 1933 and lost his German citizenship a year later,[22] was inspired for the title of his book by a remark attributed to Robert Oppenheimer after the first test explosion at Los Alamos in July of 1945.[23]

In contrast to the traditional sounded power of firearms on the battlefield, the nuclear age gave rise to a new sensory perception of weaponry. This perception was predominated from the outset by the visible effects of a nuclear blast. The age-old sonic epistemology of sounded power described above thus became a useless and delayed symptom of a former era. In other words, when the sound of a nuclear explosion could be finally heard, the bulk of the damage had already been done. Moreover, the political tendency to observe the atomic weapon primarily as a psychological one, merely serving political ends and not intended for actual use,[24] further propagated the visual imprint of nuclear explosions. Images of nuclear blasts, heat and blinding light profoundly shifted the sensory paradigm with respect to the sonic epistemology of weaponry, even without being used since the end of Second World War.

If we take this conclusion one step further, we can also observe how even the fictional image of James Bond, armed with a hi-tech pistol and silencer, is still linked to the sonic epistemology of the first half of the twentieth century. Though the fictional character of the secret agent does less to explain the sonic role of weaponry during the Cold War, it has much to say in support of our ar-

[21] John Lewis Gaddis, *We Now Know. Rethinking Cold War History*, Oxford 1997, p. 223.
[22] Peter Weiss, *Briefe an Hermann Levin-Goldschmidt und Robert Jungk 1938–1980*, Leipzig 1992, p. 13.
[23] Robert Jungk, *Brighter Than a Thousand Suns. The Moral and Political History of the Atomic Scientists*, London 1958, p. 184 [*Heller als tausend Sonnen. Das Schicksal der Atomforscher*, Bern 1956].
[24] John Keegan, *A History of Warfare*, London 1994, p. 381.

gument about the sonic epistemology of silenced power. From the very outset, silenced power implied the ability to change the role of weapons by manipulating the sonic perception of their sounds. Based on the principle of 'sonic deception', both the silencer and gas warfare enabled the use of weapons in a sonic environment not originally intended for them. Viewing gas warfare as a weapon that broke 'the rules' can also explain why, in spite of the mass atrocities committed against civilians and non-combatants alike, there was great uncertainty among the belligerent parties of the Second World War as to the 'legitimacy' of poisonous gas as a weapon, with a tendency to consider it as a last resort for extreme cases such as the threat of invasion.[25]

In the case of the silencer and poisonous gas, the ability to divorce sounds from their expected meaning became a powerful instrument for turning weapons into 'instruments of murder', placing them beyond the pale of warfare. The point was not that you could not hear the weapon, but the fact that the known juxtaposition between the sound of weapons and their auditory perception was being manipulated. It was this that changed the role of weapons and undermined the sonic epistemology of sounded power. In this sense both the silencer and gas warfare implied a reverse symmetry. Whereas the silencer kept away the sound of weapons from the silent terrain of civilian society, gas warfare maintained the silence of 'civility' on the noisy field of battle. Thus, silenced power not only caused a breakdown of the juxtaposition between sounds of weapons, their environment and their meaning; it continued to blur the long-standing distinction between civil and military spheres.

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[25] Gerhard L. Weinberg, *A World at Arms. A Global History of World War II*, Cambridge 1995, pp. 164, 482.