

Ambiguous Narratives of World War Technologies in Contemporary Military History Museums

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Abstract • This article provides an analysis of how military history museums in Germany, Britain, Belgium, Poland, and the United States exhibit and contextualize weapon technologies that were developed in the two world wars. The article focuses on technologies (gas warfare, the atomic bomb, tanks, and the V2 long-range rocket) that are directly connected to military success and innovation but also relate to dehumanization and destruction. By employing the analytical concepts of experientiality and of antagonistic, cosmopolitan, and entangled memory, this article demonstrates how museums can create open or closed narratives, steer the visitor toward particular interpretations, enhance or deconstruct the authentic aura of technological artifacts, and stage the symbolic potential of technologies. In addition, it shows how museums can educate visitors and allow them to experience the ambiguities, controversies, and complexities of these technologies.

Keywords • authenticity, entangled memory, experientiality, memory studies, military history museums, narrative, technological progress, world wars

Military history museums of the two world wars have undergone a considerable transformation in the last two or three decades. Earlier war and military history museums primarily exhibited military artifacts such as weapons, uniforms, and medals. They also told specific stories of military and technological success. These narratives tended to thematize aspects of mobilization, the strategies and events of specific campaigns and battles, military leadership, and the heroism of soldiers. At times, these museums also provided broad surveys on political situations leading to wars. A clear identification of the different parties involved in the war at hand formed the basis for such exhibitions. This was often performed via an antagonistic “good versus evil” or “friend versus enemy” paradigm. Since the 1990s, however, an increasing number of military history museums dealing with the two world wars have shifted their focus away from strictly military themes and have begun to integrate a wide range of cultural and societal aspects of military conflicts.¹ These museums are considerably more interested in the impact of war on humanity, society, and different cultures. This newer model highlights the individual stories



of ordinary soldiers and civilians, often in relation to everyday artifacts. Furthermore, the way in which these museums exhibit modern military technology is based less on technical data, the emphasis on technological innovation and progress, the charting of military success, and nostalgia for innovations of the past. Rather, they focus on the cultural contexts surrounding the introduction of new technologies and their impact on warfare and civilian life and on the way in which these contexts are entangled with other discourses of war. Consequently, museums can raise questions about the ethical ambivalences of warfare technology. Both models—the traditional military history museum and the newer military history museum with a wider focus on culture and society—exist and often overlap in the exhibition practices of twenty-first century museums.

This article analyzes the techniques museums use to exhibit four weapon technologies that brought about technological advancement and introduced new means of military warfare in the two world wars: gas, the atomic bomb, tanks, and the V2 rocket. All four technologies can be understood as a means of destruction. They were developed and deployed in order to change the course of war. Their destructive nature brings ethically challenging questions to the fore, such as whether they should have been used in the first place and whether we should memorialize them as bold technological innovations or as destructive and dehumanizing weapons. I included a wide range of world war exhibitions (almost all were conceptualized in the last fifteen years) to understand the different contested stories and memories that can be connected to world war technologies. I restricted the selection of the eight museums analyzed to European and American institutions (in Germany, Poland, Belgium, the United Kingdom, and the United States) in order to guarantee a certain comparability of exhibitions that makes it possible to compare the curatorial choices museums can make.² Most of the exhibitions selected are permanent exhibitions, though I included one special exhibition in order to demonstrate the larger room for experiments that at least some institutions employ in temporary exhibitions. Most of these museums are military history museums. They include the Imperial War Museum in London, the Bundeswehr Military History Museum in Dresden, the National WWII Museum in New Orleans; the National World War I Museum and Memorial of the United States in Kansas City; the Bastogne War Museum and the Home Army Museum in Kraków. One museum, the In Flanders Fields Museum in Ypres, could be seen more as a military peace museum; however, like the other examples, it exhibits the stories and artifacts of military campaigns and their impact. In order to avoid overburdening the scope of this article with another subgenre, I did not select technology museums such as museums that focus on specific weapons or originate at sites related to the

production or memory of a specific weapon or weapon branch. The only exception is the brief analysis of the V2 rocket exhibit in the National Air and Space Museum of the Smithsonian Institution in Washington DC, which displays a representational technique on the borderline between culture and technology. Each exhibition discussed has been visited at least once for several days on field research trips enhanced by extensive notetaking and the creation of a photographic archive, accompanied by further information provided by museum curators and researchers, museum websites, catalogs, and other publications as well as research published on specific exhibitions.

Whereas there is an extensive scholarship on representations and narratives of world war exhibitions,³ most analyses (with the exception of some case studies looking at individual museums) do not focus on how technologies are exhibited in those museums.⁴ This article presents the first comprehensive analysis demonstrating how contemporary military history museums can exhibit the emergence, implementation, impact, and remembrance of technologies of destruction. Four often overlapping dimensions in exhibition practice can help us understand the different ways in which museums deal with technological ambivalence and the complicated, politicized, and contested stories behind their development, use, and memorialization. First, museums—supplemented by objects—document the development of new technologies, exemplifying a mostly factual description that charts the emergence, impact, and military context of the technology. This style of exhibition usually tells a closed story of the past. More often than not, it synthesizes ambiguities into a single comprehensive historical development that tells a story of technological progress or of a technology's successful deployment in military campaigns. The second dimension can be seen when museums emphasize the authenticity and aura of the technological artifact. This inspires an emotional, often nostalgic, response to the artifact in the visitor, along with a sense of admiration for its invention and importance for technological progress. Historical authenticity can be defined, with reference to Walter Benjamin's discussion of the auratic work of art and its displacement through technology in the late nineteenth and early twentieth centuries, in two ways: as witnessing and as experiencing the past.⁵ Whereas original artifacts, such as bombs, tanks, or rockets, first function as authentic witnesses, they can also assist in evoking the feeling of historical authenticity in visitors.⁶ The third dimension occurs when exhibition practice creates strongly symbolic (positive or negative) effects surrounding the meaning of a technology or of an artifact representing this technology. Finally, the fourth dimension entails the ways in which museums immerse the present-day visitor in their displays. On the one hand, they can create an immersive experience using historical arguments to justify the technology. On the other, they

can also enhance critical, multifaceted understandings of the technology by emphasizing ambiguities between potentially heroic narratives of progress and the destructive, often ethically challenging, effects of new weapon technologies.

The fourth dimension of immersion and the challenging of present-day visitors originate in discussions of “new museology” in which visitors are not simply detached museumgoers passively observing artifacts. Instead of attempting to control the potential perceptions of their visitors, museums allow visitors to engage directly and actively with the exhibitions.⁷ Visitors are entrenched in their own cultural memories, knowledge, and expectations prior to the visit. The process that occurs during their engagement with exhibitions can potentially challenge them to reflect on their own implications and biases. The concept of experientiality perceives the visitor as a mediating consciousness in the museum space (an anthropomorphic experiencer), activating different potentialities held in artifacts, spaces, stories, and constellations.⁸ This concept enables us to analyze aesthetic, cognitive, and critical visitor responses to exhibition displays and to understand the degree to which a museum allows or restricts dynamic and critical visitor interaction.

Furthermore, it is important to categorize the memory types that play a role in the exhibition of military technology in military history museums. Antagonistic memory primarily positions adversaries in a pattern of “good versus evil.”⁹ Narratives of technology can confirm the identity and values of one side against another. Cosmopolitan memory universalizes the stories and impacts of war and technologies; with regard to military technology, the idea of destruction and dehumanization is the universal narrative most often employed. Lastly, entangled memory allows us to discuss the possibilities that historical education holds for the simultaneous and dynamic understanding of a multiplicity of perspectives and interpretations as well as for different acts of remembering on synchronic and diachronic levels.¹⁰ Weapon technologies can function as manifold carriers of entanglements that relate to a variety of actors and processes of history and memory. Museums can integrate and critically assess multiple traces of a technology in their museum narratives.

Gas: Progress as Destruction

The use of gas was one of the primary advancements of military technology during the First World War. From today’s perspective, it is symbolic for the increasing dehumanization of combat during the war. On the surface, the narrative structure depicting it works the same way in all museums. According to this narrative, gas warfare was developed as a new tool in trench warfare to break the war’s deadlock. Its use was

morally questionable and legally disputed according to the 1899 Hague Convention. In April 1915, the German Reich conducted the first-full scale gas attack on the Western Front near Ypres, releasing cylinders of chlorine gas onto French, Algerian, and, later, British soldiers. The Allied Powers, particularly the British and French, retaliated later in 1915, and all parties worked on developing this new technology throughout the war. Although gas caused a great number of injuries and deaths, it was not decisive. Rather, it became mainly a weapon of terror, symbolized by the artifact of the gas mask. Gas was hardly used in military warfare in the Second World War (mainly due to fears of retaliation by the other side). However, Nazi Germany used the perfidious industrial lessons it learned from the First World War to employ gas in the Holocaust.

There is no immediate memory contest regarding the exhibition of gas warfare during the First World War in museums. This is due to the fact that there is no narrative of success from any side in relation to this new technology. Thus, the educational and historical questions that arise for visitors relate to the reasons and justifications for the use of poison gas by the different sides. How can its use be justified as military progress in the first place? How can retaliation using the same dehumanizing weapon be justified?

Most museums simply document the introduction, impact, and failure of gas warfare. This can be seen, for example, in the 2006 exhibition of the National World War I Museum and Memorial of the United States in Kansas City—an exhibition that remains strongly focused on military weapons and artifacts. The first half of the exhibit depicts a form of universal warfare between the Germans and the British and French, with an emphasis on trench warfare. The story of poison gas is objectified in a large display cabinet that describes gas as a new weapons technology and synthesizes its destructive effects to portray the ultimate form of dehumanization. There is nothing contested here; gas becomes the symbol of universalizing mechanization and dehumanization in the newest methods of warfare. While the twenty-first-century curator or historian synthetically evaluates the use of gas in modern warfare, visitors are steered into a passive role in which they are directed to acknowledge the symbolic value of poison gas and gas masks.

The Imperial War Museum London reopened its First World War Galleries after extensive renovations in July 2014. In many ways, its exhibition still uses a traditional military history museum approach focusing on campaigns, battles, and soldiers. This is supplemented by stories about civilians and memory installations. The exhibition presents the First World War as a global war, albeit mostly from a distinctively British military and political perspective. As a result, its poison gas installation produces an interesting performative effect that takes an immersive-antagonistic approach.

The installation, located in a corner of a larger section entitled *Deadlock*, consists of several benches arranged around a small round table that exhibits a single artifact in a cylindrical glass case at its center (a leather glove shrunk by poison gas). On the table, blurred images depicting the impact of gas warfare appear alongside quotations that are also provided in an audio installation. One background wall displays an image of a devastated battlefield following a gas attack. Surrounding the audio-visual installation are texts containing historical overviews and quotations and artifacts relating to gas warfare.

On the one hand, the display leaves no doubt that the use of poison gas is dehumanizing and universally negative (the fact that no details are provided regarding the origin of the leather glove enhances this universal message of destruction). On the other hand, the museum simultaneously strives to make the visitor understand the British perspective and to explain why the British followed the Germans in using this dehumanizing technology. This is most evident in the audio-visual installation, which features quotations running on loop. The first quotation is from the Hague Convention of 1899 and states that all parties agree to abstain from the use of “asphyxiating or deleterious gases.” This is followed by quotations describing the painful and destructive effects of poison gas and others that rationalize the British authorization of the use of poison gas as a response to the German Reich’s introduction of this form of “cowardly” warfare. One quotation states that because war meant one must kill or incapacitate more of one’s enemies than “they of us,” it was mandatory to copy the enemy in the choice of weapon. “Gas has now become one of the normal weapons of warfare.”

The visitor is experientially immersed in these historical and partially propagandistic rationalizations of the question why the British also fought the war with poison gas. The fact that there is no formal assessment of these conclusions presents the danger that visitors will follow an “us-versus-them” rationalization and, as a result, become unable to distance themselves from wartime propaganda. It also presents the possibility that visitors will internalize the descriptions of the ineffectiveness of poison gas in breaking the military deadlock, knowledge that may enable them to develop a critical perspective on Britain’s historical decision to use “diabolical” poison gas. However, the risk that the exhibit’s experientiality remains restricted persists, since it builds on the museum’s unchallenged antagonistic structure.

In 2012, the In Flanders Fields Museum in Ypres, located near the site of Germany’s first massive use of gas in April 1915, redesigned its permanent exhibition.¹¹ Similar to the gas exhibit in Kansas City, the new permanent exhibition de-emphasizes any national perspective or “us-versus-them” paradigm and, rather, uses an experiential approach like the one found in the Imperial War Museum. The main exhibit on



Figures 1 and 2. Holograms of Fritz Haber and Willi Siebert, installation, permanent exhibition, in Flanders Fields Museum, Ypres (Belgium). (Photo by Stephan Jaeger, 2014)

gas warfare consists of a four-and-a-half-minute video installation with life-size holograms of two historical figures running on loop in a glass vitrine (see Figures 1 and 2).

The first hologram is of the German chemist and later Nobel laureate Fritz Haber, who explains how the use of gas can break the deadlock in the trenches. Following this, the German soldier and former pharmacist apprentice Willi Siebert provides a graphic description of the horrors that took place on the battlefield after the first major gas attack. The installation pitches two contradictory perspectives taken from historical documents against each other. Even if twenty-first-century visitors to the museum might be able or willing to understand Haber's conviction as a patriotic German, they will still feel the dehumanizing tone of his cynic rationalism, as Haber describes the use of gas in warfare as a story of progress and a great military invention.

The holograms seem to speak directly to the visitor in the style of an enacted testimony, inviting the visitor to emotionally react to or engage with them. The surrounding displays and artifacts leave no doubt that gas warfare is dehumanizing and should be prohibited. Visitors can opt to enter a dark tower and view photographs of gas attack victims via restricted peepholes. Although the exhibition clearly states that the

Germans started the gas warfare near Ypres, it is evident that this fact is not significant for the museum's narrative. Raw human emotions are pitched against the cynical, rational calculations of military leaders and scientists. This creates an experiential and universal experience that negates the use of such destructive weapons in warfare. Visitors hardly have a choice whether or not to agree with this trajectory of the critical assessment of the innovations of gas warfare.

Atomic Bombs: Ultimate Destruction for Peace and Freedom?

The use of gas in the First World War is represented in museum exhibitions as technological progress, total destruction, dehumanization, and a new weapon that failed to seriously affect the outcome of the war. In contrast, the atomic bomb has quite a different function in museum narratives. While it also represents major technological progress and utter destruction, in many (especially Western) narratives, the atomic bomb is clearly connected with the idea that it ended the Second World War.¹² This contest between highly negative symbolism and a positive causal narrative complicates museum representations of the atomic bombings, which consequently seem much more diverse and contentious than the exhibits on gas warfare. However, many museums do not use the controversial nature of this narrative to allow visitors to find their own critical positions.¹³ Instead, they find ways to distance visitors or to synthesize the two competing narratives.

One of the most prominent military history museums exhibiting the atomic bomb is the National WWII Museum in New Orleans. It is a typical American military history museum with a strong focus on oral history and commemoration, oriented toward combat and military missions abroad.¹⁴ The museum defines its mission as "to portray the full American experience in the war, including its ongoing meaning for global freedom."¹⁵

Two of the museum's displays are particularly instructive regarding its take on atomic bombs. The multimedia signature piece *Beyond All Boundaries: a 4D Journey through the War that Changed the World* (2009) immerses the visitor in a clearly constructed experiential world of the past. The 4D film, which was produced, directed, and narrated by Tom Hanks, shows us the multimedia effect of visualizing war and how it can be used to trigger the visitors' emotions and to sell them a political message.

The show first prepares visitors for the argument that nothing, not even the disastrous firebombing of Tokyo, could make the Japanese emperor surrender, and that consequently, an American invasion of the Japanese mainland was the only possible solution that could bring the war to an end, yet at the cost of thousands of American lives. After this,

visitors experience a sudden flash, vibrating seats, and the sound of wind, all signifying the drop of an atomic bomb, and Hanks announces the beginning of the atomic age. Next, in a sober tone, a newscaster announces the dropping of the second bomb on Nagasaki before the emotional voice of a soldier takes over, relaying the news that an invasion would not be necessary (“We were going to live; we were growing into adulthood after all”). Immediately afterward, a triumphal newscast announces Japan’s surrender and that Pearl Harbor has been avenged. Consequently, the destruction wrought by the atomic bomb is reduced to a narrative segment that guarantees that the narrative and emotional arch concludes in a triumphal victory.

Watching the audience reactions to this presentation, I concluded that the emotional spectacle of the multimedia show allows little room for different perspectives, instead emotionally binding everybody together in a Hollywood-like triumphal ending. Visitors are expected to express relief and joy as the American soldier recalls hearing the news about the canceled invasion.

The museum uses these same techniques in its *Road to Tokyo* exhibition, located in the Campaigns of Courage building, which opened in 2015. These techniques are particularly evident in the final room of the exhibition, entitled *Downfall: Endgame against Japan*.¹⁶ Via the exhibition’s subtle selection of narrative text and placement of images, the atomic bombs are depicted as the only way to end the war and guarantee global freedom and democracy. The visitor is not presented with the opportunity to consider different military or diplomatic options. Even when the museum touches upon the human element of destruction via its portrayal of the atomic bomb, this is used to reinforce its narrative. Above the exit to the room, a film shows photos of the atom bombs being loaded and dropped, accompanied by monotonous instrumental music. Afterward, the visitor experiences depictions of a destroyed city in rubble and sees dead bodies and distressed people affected by the atomic blasts for the first time.

At this point, the museum shifts from its military narrative to a humanist perspective. Here, the museum can acknowledge the barbarity and destruction of war. Whereas on the surface, the museum denotes a clear tension between humanism and wartime pragmatism, it employs a factualizing rhetoric of humanitarian necessity to justify the use of nuclear weapons to put an end to the war and transition into “a better world.”

The films and exhibits charting the atomic bomb as new technology in the New Orleans WWII Museum are a striking example of the ways in which narrative techniques can suppress all potential memory contests. Counter arguments against this technology are integrated into a forceful narrative logic that leaves no room for interpretation. Devastation is self-inflicted by the enemy; the Japanese did not act, not even to prevent

a second wave of terrible pain following the drop of the first atomic bomb on Hiroshima. Indeed, in this antagonistic narrative, any technology of destruction can be justified in the name of saving humanity.

In contrast, in its permanent exhibition which opened in 2011, the Bundeswehr Military History Museum in Dresden highlights the human element of universal destruction when displaying the nuclear weapons technology.¹⁷ For example, in the section *War and Games*, visitors encounter an American game of skill from about 1946 that requires players to “drop” two “atomic bombs” in holes on a map of Japan (representing Hiroshima and Nagasaki). Visitors are challenged to reflect upon the historical and cultural conditions under which such a game could be appealing and acceptable and are simultaneously steered toward the conviction that in the twenty-first century, marketing such a game would be impossible based on humanist grounds.

The Bastogne War Museum, which opened with a transnational, humanist message in 2014, showcases a broad but effective installation on Second World War technologies in a computer station slideshow. The final slide places the visitor in the following scenario: “Should Hiroshima and Nagasaki have been bombed?” The visitor has four options to choose from: “A: YES, to end the war;” “B: YES, to save the lives of US servicemen on the Pacific front;” “C: NO, nuclear warfare is inhumane as it destroys civilian populations” and finally, “D: NO, science should serve the advancement of humankind, not its destruction.” As is always the case in these scenarios, visitors must live with over-simplification; they only receive a relatively small amount of data before making their decisions. However, the exhibition makes them aware of the contradictory reasons behind the nuclear bombing as well as the possibility that there is not just one correct or true answer. In this way, the quiz fulfills an important meta-function in highlighting the contested memories of nuclear weapons technology.

The complications involved in the representation of nuclear warfare in museum exhibitions become particularly clear when institutions exhibit this technology by reverting to authentic historical artifacts. The Imperial War Museum in London focuses on objects in its exhibition *Peace and Security: 1945–2014*, curated in 2014. The museum proudly announces that it exhibits one of only five original casings made for the “Little Boy” atomic bomb dropped on Hiroshima on August 6, 1945. In this display, however, the aura and authenticity of the artifact (as rarity and charisma) are intentionally set up to clash with the accompanying reflexive comments from the exhibition’s curator, designer, and two historians. For example, curator Roger Tolson synthesizes the ambiguities of the atomic bomb when he describes it as “the ultimate symbol not only of political power and creative technological development, but also of absolute fear and horror.”

None of the displays analyzed above allow visitors to make a critical analysis of the historical decision-making surrounding the use of the atomic bombs and whether it was truly necessary to bring about the end of the war. That being said, the exhibitions in Dresden, Bastogne, and London all contain experiential and critical triggers that offer visitors multiple potential viewpoints. These triggers present visitors with entangled memories that supersede a singular narrative or symbolic function in relation to the use of new destructive weapons technology.

Tanks: The Auratic Artifact and Entangled Memories

My third example of technological advancements during the world wars is the tank. One major difference that characterizes exhibitions on the tank (compared to those on chemical and nuclear weapons technologies) is that these are usually based on the display of the material object itself. Although among the most beloved artifacts of war enthusiasts who visit traditional war museums, tanks can present museums with logistical challenges, such as whether it is possible for the museum building to display real tanks due to their excessive weight. Therefore, the witnessing authenticity and aura of the artifact, combined with considerable data about the protection and the firepower offered by the tank in battle, is often foregrounded in exhibitions. Furthermore, in narratives about fighting in the trenches in the First World War, the tank is depicted as a decisive innovation in warfare, while in those about the Second World War, it is highlighted as a powerful symbol for advancement, victory, and liberation. At the same time, the tank can be displayed as an artifact of entangled memory. Unlike gas following the First World War and the atomic bomb following the Second World War, the tank continues to be present on the battlefields of the world. This in turn leads to questions as to whether this technology was used by the right side in narratives of antagonistic memory.

For my first example, we return to the National World War I Museum and Memorial of the United States in Kansas City. The second half of its permanent exhibition is all about the American entry into the war and how it tilted the power balance in the Allies' favor. One of the exhibition's core artifacts is a French-made Renault FT17 tank, which was the model used by the American Expeditionary Forces. It is presented on a podium in a corner open on two sides that visitors cannot miss. Video footage and explanatory data have the dual function of both documenting and indirectly celebrating the tank's ability to break through trenches.

The Kansas exhibition presents the tank as a symbolic object of technological and military power and success. In contrast, the Bastogne War Museum uses original tanks as artifacts in a very different way. While the

relevance of tanks in the Battle of Bulge is acknowledged, any potentially positive aura this large artifact may have is immediately broken. In the museum's first room, visitors encounter a US M4 Sherman medium-sized tank. Its aura or charisma is counteracted via, among other elements, keywords in French, English, and German relating to the war above the tank display. These words include the word "tank" but also "massacre," the "Night of Broken Glass," "collaboration," and "war crimes". Later on in the exhibition, a second, partially damaged Sherman M4 is displayed. Above the tank, enlarged white paper slips with fragments of letters from soldiers in English, German, and French hang from the ceiling. These letters create the impression of a multinational "forest" on Christmas Eve 1944, when Bastogne was fully encircled by the Germans. The universality of everyday feelings from soldiers on all sides breaks through any antagonistic ideas that could potentially be emitted by the artifact. In this way, the symbolism of the tank's firepower suggested by the exhibit in Kansas City gives way to a far more peaceful and humanistic message.¹⁸

Tanks can be exhibited in such a way that any narratives of technological progress are counteracted by an emphasis on ambiguous and contested memories. A Soviet T34 tank, for example, is contextualized by a slideshow on display in the atrium of the Imperial War Museum in London.¹⁹ This slideshow highlights the entangled memory of the tank via a straightforward narrative that allows visitors to decide for themselves whether they wish to think further about the ambiguities related to the contested object in front of them. After first providing technical data on the T34 model, the museum delves into the story of the artifact on display. The tank was captured by the Israelis in the Arab-Israeli War of 1973 and later purchased by the museum, where it was repainted to resemble a Soviet tank deployed in the Battle of Berlin.

At this point in the slideshow, the museum's narrative goes on to explain how the T34 became the symbol of the Soviet victory over Nazi Germany, visible in the many T34 tank memorials across eastern and central Europe. Finally, the museum points out that the memory surrounding the T34 has become contested and that, as a result, the tank has been transformed into a symbol of oppression by a foreign power. This is due to that fact that T34 tanks were used by the Soviet Union to suppress uprisings such as the Hungarian Revolution of 1956.

The Imperial War Museum displays three of the typical techniques used to exhibit weapons technology. These include the documentation of technological data and storytelling; the representation of technology's symbolic value and the presentation of the technological object in a way that allows its aura and authenticity (in this case, simulated through its repainting) to have an effect on the visitors. It remains open to the visitors whether to passively accept the contested nature of the tank in different memorial contexts or to actively engage with the educational

message that the historical and ethical context of an artifact and a technology can change depending on the historical and cultural context.

V-2 Rockets: Between Progress, Mass Destruction, and Genocide

My final example of contested memory is the V-2 (“Vengeance Weapon Two”) rocket developed by Nazi Germany during the Second World War. Like poison gas, the V-2 was used as a mere weapon of terror and was not decisive in the outcome of the war. But unlike gas, long-range rockets and rocket technology are (like the tank) entangled in a complex history that stretches far beyond the war in which they were first introduced. Furthermore, certain aspects of the V-2 rocket’s history (including the use of forced labor in the rocket’s production, acts of sabotage and espionage during the production process, the complex history of its inventor, and the conflation of narratives of military and civilian progress regarding the development of rocket technology) create a contest of different memories. Some of these memories highlight the destruction and dehumanizing aspects of the technology, others its heroic angles. The story of the V-2 can also be told from an antiwar perspective, as a heroic narrative of nostalgia and a story of the progress of humankind and technology. Lastly, as in the case of the tank, it is important to note that the V-2 rocket holds the potential to become an artifact of admiration. This can happen when visitors are steered toward celebrating technological advancement instead of understanding and experiencing the complex entanglement between technological progress, dehumanization, and destruction.

The National Air and Space Museum of the Smithsonian Institution in Washington has had a V-2 on display since its main building opened on the National Mall in 1976. The current exhibit displays this authentic artifact while highlighting the fact that the technological data of the V-2 was the first step in the production of long-range rocket systems. The rocket is part of a larger exhibition, *Space Race*, which focuses on the rivalry between the United States and the Soviet Union and is located at the beginning of the exhibit’s first subsection, “Military Origins of the Space Race.” The V-2 is presented as an autonomous object on a small pedestal with part of its interior visible, reinforcing the exhibition’s focus on technological advancement. Surrounding the V-2 are lanterns containing informational texts and photographs that provide technological data on the anatomy of the rocket, tell the history of the V-2’s production in Nazi Germany and its use as a terror weapon, and narrate the Allies’ efforts, in both the East and West, to adapt this technology to their own long-range rocket programs.

The narrative’s emphasis is on technological development and the arms race between the United States and the Soviet Union. The first texts

and photos acknowledge the slave labor used to produce the V-2 as well as its devastating effects as a terror weapon. However, while on the one hand, the setup and narrative is meant to encourage admiration for the technology and the display of the authentic and auratic object, on the other, they highlight a story of technological progress that leads to more developed long-range rockets and to civilian achievements like the moon landing. The cost of these developments, whether it is the forced labor used by Nazi Germany or the complicity of German engineers, such as Wernher von Braun, is at best a footnote. There is no doubt that the recruitment of experts and the utilization of their technological knowledge supersedes any ethical questions. The narrative of progress, national pride, and competition with the Soviet enemy does not allow visitors to develop divergent perspectives on the V-2's story.

A completely different but similarly restricted cultural exhibit on the V-2 can be found in the Home Army Museum in Kraków (*Muzeum Armii Krajowej*). This memorial museum opened in 2000 as a joint institution of the city of Kraków and the Lesser Poland Voivodeship Kraków and was largely expanded between 2011 and 2012. It seeks to document, commemorate, and celebrate the comprehensive story and achievements of the Polish Home Army while emphasizing its importance for Polish heritage and identity today. The V-2 in this museum is a replica containing original interior parts; the lengthy text panels that surround it shape the narrative. While the exact technical data pertaining to the V-2 is mostly disregarded in the exhibition, the museum highlights in detail the dehumanizing impact of the V-2 as a weapon of terror. Once it is established as an immoral weapon of destruction, visitors can read several excerpts taken from an interview with Wernher von Braun, in which von Braun points out that he does not see any moral dilemma in developing the V-2 since missiles are basically instruments of transportation, like planes. Visitors are hardly given a choice other than to read von Braun's remark as mere cynicism.

Neither the inventor nor the rocket gains heroic or auratic status in the Home Army Museum. Instead, the story shifts to celebrate the heroes of the Polish intelligence service who gathered all the information on the V-2, its technology, and its production site. The exhibition celebrates the "best intelligence in the world." The ingenious understanding of the V-2 technology by Home Army agents in drawings of its mechanisms is most important. In this way, the V-2 becomes a narrative tool to advance the story of the patriotic and heroic Home Army. As in the Air and Space Museum, the narrative here is restricted to one viewpoint, making it hard for visitors to experience any other perspectives that are not inherent in the museum's master narrative.²⁰

It is evident from the permanent exhibitions of the Bundeswehr Military History Museum and the Imperial War Museum in London that it

is possible to exhibit the ambiguities and different viewpoints associated with the V-2.²¹ The Imperial War Museum exhibits a V-2 rocket and a V-1 flying bomb in its atrium, supplemented by a computer slideshow similar to the one in its T34 tank display. On the one hand, the museum documents the technological and historical context surrounding the V-2 and allows visitors to perceive it as an authentic object, communicating an aura of technological progress. On the other, it breaks these impressions down in multifaceted ways. First, it immerses the visitor by noting that the museum was damaged numerous times by V-1 and V-2 attacks during the war. It does so by drawing the visitor into an emotional reaction through a sketch of the museum building with a little red square and the caption "YOU ARE HERE." Second, the museum counters the object's technological aura of progress by cross-referencing its Holocaust Exhibition, located on the fourth floor. This exhibition displays a uniform worn by Jan Imich, a survivor of the Mittelbau-Dora concentration camp, where he was forced to work on the production of the V-2. Third, the museum juxtaposes Wernher von Braun's postwar work on rocket development in America with his knowledge of the conditions in Mittelbau-Dora. The museum concludes by highlighting von Braun's ambiguous legacy but leaves it up to the visitors to decide whether it is acceptable to work in partnership with somebody who was involved in slave labor for the technological progress of humankind.

The Bundeswehr Military History Museum displays the V-2 in one of the voids of Libeskind's wedge which cuts into the old arsenal building of the museum. Whereas in London the visitor can admire the shape of the V-2 in the museum's atrium, Libeskind's architecture prevents such a viewing. Here, the shell of the rocket is presented in such a way that it can never be seen as a complete object, complicating any possible admiration of the auratic object. The V-2 is part of a symbolic spatial cluster. Visitors learn about the history and working conditions in Mittelbau-Dora at a computer station and via original artifacts.

The proximity of these two objects initially seems to highlight the contrast between the military and civilian use of rocket technology. However, they have a far more complex relationship, as indicated by the last sentence of the survey panel, according to which "East German leaders celebrated the first German space flight as proof of the superiority of socialism over capitalism." In other words, the simplistic contrast between military and civilian utilization of rockets is immediately contradicted by their political and propagandistic usage by both sides in the Cold War. Hanging high in the air next to the V-2, visitors see the manned space capsule Soyuz 29 that the East German astronaut Sigmund Jähn and his Soviet crew used to return to earth in 1978. This cluster also includes an art film by Klaus vom Bruch und Manuela Günther that reflects on the burden of scientific knowledge and progress as well as a London dollhouse

featuring gas masks and an Anderson shelter in its garden, symbolizing the effect of the V-2 on civilian everyday life.

Whereas the Imperial War Museum merely states that von Braun's story is ambiguous, the Bundeswehr Military History Museum performs this ambiguity. It allows its visitors to experience, via structural experientiality, the complex meanings behind technological innovation within and beyond war for civilians, forced laborers, scientists, and humankind.



Figure 3. *Crazy Daisy* in front of the Bundeswehr Military History Museum, Dresden, special exhibition *Targeted Interventions and Gender and Violence: War is for Men—Peace is for Women?* (© Birgit Dieker, photo by Stephan Jaeger, 2018)

Another example shows us how the symbolic value of technology can be deconstructed and opened to numerous interpretations in a way that allows its contested stories to become present for visitors. In 2018, the Bundeswehr Military History Museum featured the art exhibition *Targeted Interventions* supplementing its special exhibition *Gender and Violence: War is for Men—Peace is for Women?* One artwork displayed in front of the museum building was Birgit Dieker's *Crazy Daisy* (see Figure 3), which consisted of a rocket made of pieces of female mannequins, suggesting mutilated bodies. The mannequin legs form the base upon which the rocket's violence is built. The museum's text panel explicitly related Dieker's artwork to the history of the V-2. Visitors could decide how to interpret this symbolic deconstruction of the rocket's aura that reflects the male gaze and violence against women together with the technology's destructive power.

Conclusion: Education and a Multifaceted Understanding of Destructive Technology

It is apparent that the expectations of stakeholders and visitor communities can influence how museums narrate stories of technologies. For example, the US world war museums in New Orleans and Kansas City depend strongly on revenue from admission and membership fees and private fundraising. This means that any technology narrative must be integrated with the dominant perspective on the wars and the master narrative that surround them in American cultural memory. This restricts these museums' ability to reflect critically on technologies and memory contests and reduces their options to educate audiences on the multiple perspectives embedded in the narrative of a specific technology. Core stakeholder interest groups, such as war veterans in New Orleans and the Home Army Museum in Kraków, can strongly influence the exhibition of technology narratives.

Yet it is clear that antagonistic friend–enemy narratives are not the only type of narrative that can restrict narratives relating to technology. Other such narratives include cosmopolitan narratives like those seen in the In Flanders Fields Museum in Ypres. Ypres, as a “Peace City,” drives the narrative about military technology in a direction that only emphasizes the destruction wrought by the technology. Even a highly innovative museum like the Bundeswehr Military History Museum cannot act fully independently since it operates under the supervision of the German Federal Armed Forces. This means that it must, at least to a certain extent, provide a positive image of the Bundeswehr, as it functions as an institution to educate German soldiers about their organization and German military history in general.²² At the same time, however, even a provocative artwork such as Dieker's *Crazy Daisy* was widely accepted in

the press reactions to the special exhibition. The Bundeswehr Military History Museum has reshaped its audience's expectations in a way that makes its societal commentary possible via an aggressive deconstruction of technology's aura. The Imperial War Museum in London operates as an educational history museum but still also reinforces a commemorative function. As a result, it is partially limited in its critical ability to display multiple storylines and leave them open to the visitors' interpretation.²³

In summary, this article has demonstrated the representational possibilities and challenges museums can work with in order to exhibit, contextualize, and deconstruct narratives of technology. Whereas the existing research usually focuses on the contexts, discourses, and narratives of one or two museums or on more general mechanisms of story-making,²⁴ this article conceptualizes the exhibition of specific technologies and weapons of destruction via the lens of authenticity, entangled memories, memory contests, and structural experientiality. This allows museum professionals to understand their options and choices regarding the exhibition of military technologies of destruction and gives scholars an idea how the narratives and staging of military technologies (as artifacts and as stories) can be theorized and how they relate to other themes and discourses of world war exhibitions.

The turn toward a stronger focus on culture and society in military history museums reduces the potential for explicit memory debates or controversies like the ones surrounding the Enola Gay exhibition in the National Air and Space Museum in Washington in 1995 or the bomber campaign controversy in the Canadian War Museum in Ottawa between 2005 and 2007.²⁵ This is true as long as the museums cater to their main audiences, particularly in their permanent exhibitions.

Memory contests and controversies relating to technology of destruction in the world wars usually occur in museums with an antagonistic or cosmopolitan memory narrative. First, technology narratives can either create a strong causal chain of events via an argumentative line that celebrates or justifies technology (New Orleans) or be deconstructed to support other antagonistic and heroic narratives (Kraków). Second, the aura of technologies can be used to celebrate examples of these technologies as authentic artifacts, usually supported by detailed data on the military and scientific impact of the technology (Kansas City, Washington). Third, the symbolic value of a military technology can be utilized both to reinforce antagonistic narratives of progress and by museums that emphasize the destructive power of such technology as part of a narrative toward peace (Ypres). However, it can also be found in the symbolization of the tank as a sign of liberation in relation to the Soviet or Western Allied advances at the end of the Second World War (London, Bastogne).

The fourth aspect, which challenges visitors to confront the contradictions of a story about technology, allows museums to present world war technologies as contested sites of education that highlight the potential of entangled memory without subscribing to one interpretation. These sites can address historical challenges (gas warfare in London and Ypres) or document competing storylines (tank and V-2 in London) of these technologies. Representations can allow visitors to experience a structural experientiality regarding the ambiguities and entangled memories of technologies (Bastogne, V-2, and Dieker artwork in Dresden). These different choices made by museums reveal that instead of exclusively deconstructing the narratives of progress and the impact of new technologies of destruction, it seems to be more effective to acknowledge them while reflecting on their entangled memories.

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Notes

1. For a general overview of world war museums in the early twenty-first century, see Thomas Thiemeyer, *Fortsetzung des Krieges mit anderen Mitteln: Die beiden Weltkriege im Museum* (Paderborn: Schöningh, 2010). For a more recent discussion of the Second World War, see Thomas Thiemeyer, "Multi-Voiced and Personal: Second World War Remembrance in German Museums," trans. Erin Johnston-Weiss, in *Views of Violence: Representing the Second World War in German and European Museums and Memorials*, ed. Jörg Echternkamp and Stephan Jaeger (New York: Berghahn, 2019), 27–51. For an excellent case study of the transformation of the exhibition of military technology, see Ralf Raths, "From Technological Showroom to Full-Fledged Museum: The German Tank Museum Munster," in *Does War Belong in Museums? The Representation of Violence in Exhibitions*, ed. Wolfgang Muchitsch (Bielefeld: Transcript, 2013), 83–98. On the historical dimensions of exhibiting the First World War, see Jennifer Wellington, *Exhibiting War: The Great War, Museums, and Memory in Britain, Canada and Australia* (Cambridge: Cambridge University Press, 2017). A similar trend toward more society and culture can also be seen in the discipline of military history; see, for example, Thomas Kühne and Benjamin Ziemann, eds. *Was ist Militärgeschichte?* (Paderborn: Schöningh, 2000).
2. This article does not aim to provide an overview of all exhibitions on a specific weapon technology. The goal of the selection of the eight museums is to allow for a representative discussion of different ways to exhibit weapons of destruction used in the two world wars and to tell their stories.

3. Cf. Thiemeyer, *Fortsetzung des Krieges mit anderen Mitteln*; Jay Winter, "Museum and the Representation of War," in *Does War Belong in Museums? The Representation of Violence in Exhibitions*, ed. Wolfgang Muchitsch (Bielefeld: Transcript, 2013), 21–37; Ekaterina Makhotina et al., eds., *Krieg im Museum: Präsentationen des Zweiten Weltkriegs in Museen und Gedenkstätten des östlichen Europas* (Göttingen: Vandenhoeck & Ruprecht, 2015); Anna Cento Bull, Hans Lauge Hansen, Wulf Kansteiner, and Nina Parish, "War Museums as Agonistic Spaces: Possibilities, Opportunities and Constraints," *International Journal of Heritage Studies* 25, no. 6 (2019): 611–625, doi: 10.1080/13527258.2018.1530288; Jörg Echternkamp and Stephan Jaeger, eds., *Views of Violence. Representing the Second World War in Museums and Memorials* (New York: Berghahn, 2019); Stephan Jaeger, *The Second World War in the Twenty-First-Century Museum: From Memory, Narrative, and Experience to Experientiality* (Berlin: de Gruyter, 2020), 47–60, doi: <https://doi.org/10.1515/9783110664416>.
4. See Raths, "From Technological Showroom."
5. Eva Ulrike Pirker and Mark Rüdiger, "Authentizitätsfiktionen in populären Geschichtskulturen: Annäherungen," in *Echte Geschichte: Authentizitätsfiktionen in populären Geschichtskulturen*, ed. Eva Ulrike Pirker et al. (Bielefeld: transcript, 2010), 11–30, here 17–18.
6. Thomas Thiemeyer, "Werk, Exemplar, Zeuge," in *Historische Authentizität*, ed. Martin Sabrow and Achim Saupe (Göttingen: Wallstein, 2016), 80–90. Thiemeyer differentiates between three types of authenticities of museum artifacts, which can overlap: the unique original (usually a work of art), the witness artifact (that provides authenticity via its reference to the past), and the example that models or represents a prototype. The witness artifact is often shaped via the aura it creates by referring to a particular historical event or person, making it a unique witness (87). Cf. Constanze Hampp and Stephan Schwan, "The Role of Authentic Objects in Museums of the History of Science and Technology: Findings from a Visitor Study," *International Journal of Science Education*, part B, 5, no. 2 (2015): 161–181, doi: 10.1080/21548455.2013.875238I. Hampp and Schwan identify four functions of authenticity for museum visitors of technology museums: rarity, charisma, history, and functionality. Whereas in the present article, the historical or witness function is most significant for artifacts of weapon technology, this often overlaps with functions of originality, rarity, and charisma.
7. Rosmarie Beier-de Haan, "Re-staging Histories and Identities," trans. Allison Brown, in *A Companion to Museum Studies*, ed. Sharon Macdonald (New York: Blackwell, 2006), 186–197, here 192–193.
8. See Jaeger, *The Second World War in the Twenty-First-Century Museum*. Whereas this article is based on some of the theoretical assumptions I developed in my monograph *The Second World War in the Twenty-First-Century Museum*, which also discusses the museums in Bastogne, Dresden, London, and New Orleans (see references for more general in-depth studies of the exhibitions in subsequent endnotes), the present article develops a new research question; namely, how contemporary military history museums can exhibit the emergence, implementation, impact, and remembrance of technologies of destruction. It supersedes the monograph by examining specific weapons

- and narratives of technology and technological progress, by analyzing narratives of technology from both world wars and by providing close readings of entangled technology and weapon-related memories and competing narratives from a wide variety of European and North American museums.
9. On cosmopolitan memory, see Daniel Levy and Natan Sznajder, "Memory Unbound: The Holocaust and the Formation of Cosmopolitan Memory," *European Journal of Social Theory* 5, no. 1 (2002): 87–106, doi: <https://doi.org/10.1177/1368431002005001002>. For a criticism of both cosmopolitan and antagonistic memory and an overview of the development of the more dynamic and critical category of agonistic memory, see Anna Cento Bull and Hans Lauge Hansen, "On Agonistic Memory," *Memory Studies* 9, no. 4 (2016): 390–404, doi: [10.1177/1750698015615935](https://doi.org/10.1177/1750698015615935).
 10. Gregor Feindt, Felix Krawatzek, Daniela Mehler, Friedeman Pestel, and Rieke Trimçev, "Entangled Memory: Toward a Third Wave in Memory Studies," *History and Theory* 53.1 (2014): 24–44, here 35, doi: [10.1111/hith.10693](https://doi.org/10.1111/hith.10693).
 11. For an analysis of its exhibition technique, see Silke Arnold-de Simine, *Mediating Memory in the Museum: Trauma, Empathy, and Nostalgia* (Basingstoke: Palgrave Macmillan, 2013), 46–48; 75–77, 193, and Stephan Jaeger, "Visualization of War in the Museum: Experiential Spaces, Emotions, and Memory Politics," in *Visualizing War: Emotions, Technologies, Communities*, ed. Anders Engberg-Pedersen and Kathrin Maurer (London: Routledge, 2017), 165–181, here 172–175.
 12. The Japanese narrative (a discussion of which goes beyond the scope of this article) does the opposite. It focuses clearly on the aftermath of the bombing, the universal destructive power of atomic bombs and the commemoration of the victims. A good example is the Hiroshima Peace Memorial Museum, which was founded in 1955 and most recently redesigned between 2017 and 2019. Cf. Jooyoun Lee, "Yasukuni and Hiroshima in Clash? War and Peace Museums in Contemporary Japan," *Pacific Focus* 33, no. 1 (2018): 5–33, here 18–22, doi: [10.1111/pafo.12109](https://doi.org/10.1111/pafo.12109). What the Japanese museums also fail to do is to exhibit the potential for contested memories of the atomic bombing narrative. The American argument for the need of the bombs is downplayed, and there is no serious attempt to understand either the historical context of the war or Japanese guilt and agency that led to the dropping of the atomic bombs.
 13. The political debates surrounding the Enola Gay exhibition in the Smithsonian National Air and Space Museum in Washington in 1995 demonstrate the extent to which historians risk not achieving their educational goals when they do not integrate existing personal memories of powerful interest groups (such as war veterans) and try to challenge mainstream collective memory. Cf. Susan Crane, "Memory, History and Distortion in the Museum," *History and Theory* 36, no. 4 (1997): 44–63, here 57–63, doi: [10.1111/0018-2656.00030](https://doi.org/10.1111/0018-2656.00030). See also Vera L. Zolberg, "Museums as Contested Sites of Remembrance: the Enola Gay Affair," in *Theorizing Museums: Representing Identity and Diversity in a Changing World*, ed. Sharon Macdonald and Gordon Fyfe (Oxford: Blackwell, 1996), 69–82.
 14. For a comprehensive analysis of the museum's exhibition strategies and narratives, see Jaeger, *The Second World War*, 95–107.

15. This text appears on a memorial slab in front of the Salomon Victory Theater on the Battle Barksdale Parade Ground.
16. For a detailed analysis of this room, see Jaeger, *The Second World War*, 285–288.
17. The Bundeswehr Military History Museum is a model museum for the creation of historical structures, allowing for the active visitor to potentially explore and experience multifaceted interpretations of warfare. A wedge by architect Daniel Libeskind cuts into the 1897 classicist arsenal building and disrupts its complex history in order to fragment and complicate the memory of the past. To fulfill its goal of representing the history and anthropology of violence, the museum takes a twofold approach. First, it presents the traditional story of German warfare from 1300 to the present as a chronological exhibition in the original arsenal building. Second, a thematic exhibition in Libeskind's wedge confronts the visitor with the violent effects of war as ideas and themes. For a full analysis, see Jaeger, *The Second World War*, 129–149 and Cristian Cercel, "The Military History Museum in Dresden: Between Forum and Temple," *History & Memory* 30, no. 1 (2018): 3–39, doi: 10.2979/histmemo.30.1.02.
18. In 2013, as part of the commemoration of the anniversary of the destruction of Dresden, the Bundeswehr Military History Museum in Dresden, together with the Dresden artist community association Louisen Kombi Naht exhibited a Leopard 1 tank covered in a colorful knitted blanket in front of the museum building. As a symbol against war and violence, the installation completely deconstructed the tank's aura as an artifact of powerful battle technology.
19. The Imperial War Museum in London reopened its reconstructed atrium in July 2014. Whereas the previous atrium had been considerably smaller and cluttered with large objects, the new atrium only displays seven exhibits of one or two objects in its "Witnesses of War" exhibition.
20. For a discussion of restricted experientiality, see Jaeger, *The Second World War*, 61–93.
21. For a more detailed analysis of the V-2 installation in both museums, see *ibid.*, 278–282.
22. Cf. Jaeger, *The Second World War*, 129–132; Cristian Cercel, "The Military History Museum."
23. Cf. Jaeger, *The Second World War*, 88–93.
24. Cf. endnote 3.
25. On the Enola Gay exhibition, see earlier in this article; on the debate about the Canadian War Museum, see Robert Bothwell, Randall Hansen, and Margaret MacMillan, "Controversy, Commemoration, and Capitulation: The Canadian War Museum and Bomber Command," *Queen's Quarterly* 115, no. 3 (2008): 367–387.