

CASE STUDY 5

WHEN CLEANING UP THE BATTLEFIELDS FROM WHEN TIMES OF WAR HAVE POLLUTED SOILS IN TIMES OF PEACE: A CASE STUDY OF A SILENT BUT VISIBLE TOXIC LEGACY FROM THE GREAT WAR

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Introduction

Lasting physical and chemical environmental disturbances induced by wars are an invention of the XIXth century as a consequence of the increase of the power of new kinds of arms and explosives. During World War One (hereafter WWI), ammunition and energetic material were used at an unprecedented scale with an estimated 0.9 to 1 billion explosive shells fired on the Western Front, as well as hundreds of millions of grenades and trench artillery munitions (Linnenkohl 1996). The unexpected and sudden end of the war in November 1918 on the western front led to an accumulation of excess, unused, and obsolete munitions which were collected and stored in restricted dumps. These chemical and conventional munitions were composed of chemical elements and compounds with potential toxic effects on health, particularly as they rapidly deteriorated with time and weather. What had been essential weapons for achieving victory quickly became hazardous, undesirable war remains. There was an urgent need to safely neutralize this war waste and to recover the valuable material contained in it for commercial purposes. The materials included projectiles, explosives, propellants, and chemical warfare agents were composed of toxic elements (arsenic, lead, zinc, copper, cadmium, etc.) and chemical synthetic substances (like nitroaromatic compounds), and their danger was not only the threat of explosion but also contamination to soils and groundwater. The history of this hazardous war waste reveals the divergence of the valorized war memory promoted in the museums and battlefields of the Great War and the amnesia regarding its toxic heritage of environmental contamination.

Post-Conflict War Waste

The history of the demolition of WWI munitions and the resulting severe soil contamination and point sources of pollution are covered in detail (Hubé 2016, 2017; Bausinger et al., 2005, 2008). After the Armistice, the Allies had to manage their own surplus of salvaged ammunition, including both unexploded fired rounds and unused ammunition. Further, munitions were discovered in soils of the former battlefields during the restoration of the devastated grounds, or simply lying on the surface but hidden by mud. Another priority was the clearing of farmland from dangerous munitions when civilians returned and to avoid irresponsible and dangerous looting. In brief, the demolition and recycling process included dismantling, neutralizing, and detonating the weapons. Where that was not possible they were disposed of in underground and underwater deposits, including rivers, lakes, and off the coast. The process required managing not only an unprecedented quantity of artillery from the first industrial war, but also the new specialization of artillery including chemical, explosive, and incendiary shells. These dumps of the end of war were different from those of 1914 because of a larger diversity, origins of munitions in it, and the presence of a significant proportion of chemical shells. The projectiles that were stored outdoors quickly deteriorated. With corrosion, distinctive paint marks disappeared and the seals in the chemical rounds weakened, increasing the risk of leakage. The demolition process was dangerous for workers and residents of nearby villages. For example, archival records document that in 1927 “worker Eugène Retours was poisoned by phosgene gas when emptying a 150-mm shell” (L’Humanité 1927).

The Case of the Forest of Spincourt

One site in particular, “Place à Gaz” in the Spincourt Forest, exemplifies the history of the post-war weapons demolition and the complexities of toxic war heritage. Following the Armistice, French, British, American, and armies, helped by Prisoners of War (POW) and civilian labourers conducted salvage, transportation, sorting, and neutralization of ammunition operations until the end of 1919. Vast quantities of munitions, and especially old ex-German chemical ordnance, were accumulated in the region of Spincourt, c. 20 km northeast of Verdun (Meuse). The transportation and the storage of old-German ammunition was made possible by a dense and well-preserved railroad network installed by the German during WWI to serve the artillery batteries having fired on Verdun battlefield. The site in the Spincourt Forest was used by a private company under the name F.N. Pickett & Fils, one of the largest delaboration companies on the western front during the interwar period, to burn in open trenches an estimated 200,000 German chemical weapons (Forget 1928). While poorly documented historically, the “Place à Gaz” is one of the most visible because of the severe top-soil contamination and blackened ground, hindering the growth of vegetation and creating a clearing of about 1,000 m² (Figure 1).



FIGURE 1 Place à Gaz. Cross-section of a trench shows the residues of Blackened Open-burning (OB) chemical shells overlying compact clay. (D Hubé, October 2014).

Since 2003 it has also been the subject of scientific testing and has seen extensive media coverage (Le Figaro 2007). Studies documented extremely high concentrations of dioxins, arsenic, and zinc in soils, residues, and nearby sediments. Based on those results, it has been recommended that the site be capped with a permanent and impermeable cover.

Conclusion. The Silent Legacy of the Great War

Despite its proximity to Verdun, there is no mention of the weapons destruction or its environmental impact at the battlefield interpretive center or public interpretation, lacunae echoed in other WWI heritage sites. This lack of collective memory may be explained by several factors. Firstly, at the end of the Great War, ammunition destruction had never before been experienced on an industrial scale, and there was no specific administration to manage and regulate such new industrial activities, particularly given the disruption of the French government at the end of the war. Furthermore, the archive resources are dispersed, rare, incomplete, largely relegated to administrative correspondence (Clout 1996), some of which were destroyed during WWII. Another explanation is that these operations, dealing with material remains of a passing war, objects of death and destruction, have been



FIGURE 2 The cleaning of shell burning trench at Pickett's C-Factory in Trélon (Nord), c. 1922. The staff is standing on empty burned shells and mines (private collection).

suppressed or denied by the local population who just wanted to return to the normality of peacetime. Furthermore, numerous workers in these destruction sites were from the area, but there were also temporary workers hired from the east of Europe, from Spain, Portugal, and North Africa (Figure 2).

Lastly, there is a tendency for the residents who live on or close to former battlefields to trivialize contamination related to old ammunition and to forget any associated risks. For example, historian and journalist Olivier Saint-Hilaire and the author interviewed an inhabitant, Mr Y., 93 years old, of the village of Domléger in the Somme. He remembered only the most spectacular events, such as the accidental detonations or burns which caused injuries and the violent death of some workers, and not the environmental impact (Saint-Hilaire & Hubé unpublished). Similarly, an inhabitant of the village of Vaudoncourt, near Spincourt, reported that when he was young, he played in “deep craters with all colors” and had collected green-glass phials in the field “we used as inkpot at school”. He added, after explaining where the phials came from, “I better understand why we suffer so often from headaches at school”. When visiting three burning grounds of the former “C-Factory” at Trélon Liessies, the author met local historians who reported that in local memory the bare soils of the clearing were due to the fire intentionally caused by the Germans prior to their retreat in 1918. The three clearings were well-known to the inhabitants but what had caused the bare ground was less clear.

World War I museums, memorials, cemeteries, and historic sites abound across northern France. In contrast, there is no monument in France to remember the

sacrifice of those who had been injured or have left their life to disarm, rendering peaceful the soils of former battlefields. Similarly, there is little public interpretation of the war's environmental impact or its ongoing contamination of soil and water. The greatest industrial war gave birth to an unseen industrial post-war which vanished from collective memory. Its chemical traces in the contemporary landscape exceed French and international toxicological standards. There are no natural processes that will attenuate these persistent risks; only remediation which, to date, has not yet started. Long after the end of the military conflict, pollution at Place à Gaz continues the slow violence of the war that produced it.

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