

# Containing chemical warfare: anti-gas measures for factory workers, health staff and the general population in Spain during the Rif War (1921-1927)

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**Abstract.** Studies on chemical warfare have only recently focused on the containment of the domestic impacts of the production, transport, storage, and use of chemical weapons. Beyond the protection of soldiers in the battlefield, “containing” chemical warfare demanded a much larger set of material measures that reached into various spheres of society. In this paper, we propose an inclusive definition of “military containment” comprising those measures and we try to apply it to the particular case of Spain during Morocco’s Rif War (1921-1927), one of the main armed conflicts of the interwar period. We will deal with three types of measures: a) those preventing that the workers of military complexes and/or civilian factories manufacturing chemical weapons suffered from intoxications and accidents that could hinder or stop production; b) those seeking that the healthcare staff of military and civil hospitals took care of the gassed soldiers and workers without exposing themselves to the effects of chemical substances; and c) those needed to keep the general population “distanced” from the hazards and accidents associated with the production, transport and storage of gases.

## 1 Introduction

Historians of chemical warfare have only recently begun to explore how the ability of a state to deploy this novel form of warfare required not just the material means to produce and use poison gases, but also to “contain” their eventual domestic “collateral effects”. Regarding the latter issue, most available bibliography has focused on the protection of soldiers on the battlefield – with special attention paid to gas masks, respirators, clothes, and other protective gear – or in the organization of “passive defense” schemes to protect rear-guard civilians. [1, 2, 3] However, these measures were meant to “contain” the effects of an enemy’s chemical offensive, rather than of one’s own management of gases. The latter required a much larger set of material procedures that reached far beyond the war front and the army to the whole society and territory. In this paper, we will focus on three types. On the one hand, measures that prevented workers in military complexes and/or civilian factories manufacturing chemical substances and projectiles from suffering accidents that could hinder or stop production. [4] On the other hand, those seeking that the healthcare staff of military and civil hospitals took care of gassed soldiers and workers without exposing themselves to the effects

of chemical substances. Finally, those deployed to keep the civil population “distanced” from the hazards and accidents associated with the production, transport and storage of gases. [5]

We will briefly explore these domestic “matters of containment” of chemical warfare for the period of the Rif War, a conflict that confronted Spain and France with local insurgents in northern Morocco between 1921 and 1927. This was one of the main clashes of the interwar period in which chemical weapons were used, together with the Russian Civil War (1917-1922), the British suppression of the Iraqi Revolt (1920), the Italian wars in Libya (1923-1932) and Abyssinia (1935-1936), and the initial stages of the Second Sino-Japanese War (1937-1945). [6] During the Rif War, the Spanish army would develop the modern air force and the chemical warfare scheme which the most powerful belligerent countries had already established during World War I (WWI). The production of poison gases and its use in Morocco, successfully concealed for over half a century, have been exposed since the 1990s by international and Spanish researchers [7, 8, 9, 10, 11, 12, 13, 14, 15]. Two main issues have been addressed. On the one hand, the figure of Hugo Stoltzenberg, a chemist and industrialist who sold German WWI gas stocks to Spain and directed the installation of a military chemical weapons production facility at La Marañosa, near Madrid. On the other hand, the types and quantities of chemical weapons produced and their use in combat, including an assessment of their eventual impact on the outcome of the war and on the local civilians’ health and living conditions, during the conflict and until the present day.

In this paper, we will first of all briefly present our theoretical approach to the concept of “military containment”. Then, we will provide a quick overview a) of worker protection measures taken in the filling workshop set up within the La Marañosa gas factory; b) of protective gear worn by doctors in military hospitals in Spanish Morocco; and c) of the security reasons alleged for the election of the remote (and rather impractical) La Marañosa site for the establishment of a military gas factory.

## **2 Military containment: a short definition**

The concept of “containment” is used, with different senses, in many disciplinary fields, from epidemiology to geography, from psychology to sociology, from biology to environmental science. Its application to military studies has taken place, however, as a by-product of its use in history and political science. Here, containment came to designate the policy of democratic states, and more especially the United States, towards Fascist regimes during the 1930s, and towards the Soviet Union and the Communist block during the Cold War. Experts have further distinguished the “militarized” containment that aimed to check the global expansion of Communism from the post-Cold War “soft” containment, which uses diplomatic, economic, or cultural strategies to deal with countries like Russia, China, North Korea or Iran [16, 17]. Military containment could range from engagement in proxy wars in various regional settings to the deployment of military bases in strategic spots throughout the world or the creation of a nuclear arsenal for dissuasion purposes. In this sense, it is equivalent to the concept of “deterrence” (military deterrence, atomic deterrence), which has been much more frequently used. Deterrence is usually understood as “a policy that seeks to prevent the leaders of a country from resorting to the use of military force by threatening military retaliation”. [18]

We propose here a less politically-oriented understanding of military containment. This understanding is inspired by and could actually be taken as an expansion of the concept of “militarized environment”, defined by Chris Pearson as “simultaneously material and cultural sites that have been partially or fully mobilized to achieve military aims”. [19] On this basis, we conceive “military containment” as the legal and material strategies deployed for preventing all sorts of damages and disorders caused by military activities and operations, either in the domestic rear-guard, or in the battlefield, both in times of war and peace. The

containment of chemical warfare would, thus, comprise the particular measures taken to prevent the harmful effects of the production, transport, storage and use of chemical weapons. We will now proceed to analyse some of them in relation to Spain's involvement in the Rif War.

### **3 Work organization in filling workshops**

During 1925 and 1926, Spanish army officers did training stages at La Marañosá in order to become familiar with gas production processes. Among other things, they left a written description of the workshop set up for filling shells with fumigenous substances. [20] In the beginning, the workshop's workspace and machinery hardly prevented the full exposure of workers to substances. All operations were performed within a single, small-sized *cobertizo* (shed). A sort of "container" was located above a pillar at the centre of the shed. Fumigenous substances arriving at the factory in metal drums in liquid state were pumped into the container, which had several "locks" to let the liquid flow into graduated glass bottles. Open-topped shells were placed below the bottles. Workers opened the locks manually and, once the required quantity of substance had passed through the bottles and filled the shells, they closed them again. The upper half of the shells had to be screwed and then sealed with mastic cement by the operators so that their content was not spilled during transport by train and ship to the war front.

Time passed before some changes were introduced to try to improve safety. Essentially, the filling process became more complex through division in several actions: 1) unpacking of shells; 2) cleaning and pressing of shells and removal of their detonators; 3) shell filling; 4) re-placement of detonator and mastic seal; 5) identification and separation of shells with fume escapes for mastic re-seal; 6) shell packing. These operations were now carried out in four different "*tinglados*" (sheds) "to achieve maximum ventilation and so that workers, often shrouded in smoke, could do their job more comfortably". The shell-filling operation itself, however, continued as before, with a "drum" located above an elevated concrete block and using graduated bottles with manually operated locks. The workshop remained, thus, weakly automatized, so the average output continued to be around 50 shells per hour or 400 per day. Nothing was said in the officers' reports about the masks, gloves, or special protective gear, so workers must have continued to do the procedures "often shrouded in smoke".

### **4 Protective gear for healthcare staff**

The production of chemical weapons, as well as its transport, storage and use in combat by the Spanish army in the Rif War resulted in an unspecified number of casualties among Spanish workers and soldiers. As a result of this, some military and civil hospitals were obliged to create specific units for the care of gassed patients, especially for those who had been exposed to the effects of yperite (mustard gas). The health staff in these "*clínicas de iperitados*" (yperite clinics) soon realized the need to wear protective gear to be able to do their job without the chemical substance attached to the patients' body or clothes causing them damage and, thereby, compromising the whole care scheme. Thus, in the summer of 1924, a military hospital in Spanish Morocco requested "four caoutchouc aprons and four masks of the German type" for its staff. Although the gear was received just one week later, the lack of additional information prevented its use. The head of the army health service in that district got immediately in contact with higher authorities in Madrid so that "instructions were sent for the use of those masks, taking into account that they will be used [as a protection] against yperite" and also asked "if the masks are ready to use and if they need

any kind of compound to neutralize the effects of the gas for which they are intended". Days later, a reply was received, informing that the masks

"are not so-called war masks, they are made to protect the user against dust and infectious agents; but as they also have independent valves for inspired and expired air, as well as two air-purifying filters, if an appropriate neutralizer [neutralizing substance] is placed in them, they [the masks] can also be used against toxic gases". [21]

## 5 Remote location of production facilities

The decision to set up a military gas factory in Spain was taken some months after the negotiations between the Spanish government and the German chemist and industrialist Hugo Stoltzenberg were successfully closed in mid-1922. [6] Several locations were considered before a commission of army experts finally chose La Marañoso, a land plot located less than 25 km southeast of Madrid. In its official report, the commission specified that the production facilities to be built there would occupy "a terrain of 1000 x 400 meters", to which "a security perimeter of 3km should be added, in prevention of an eventual accident or an escape of toxic gases". [22] The whole site should be "relatively flat, as well as uninhabited and uncultivated so that it was not too expensive" – these features were also essential from a security point of view. A royal decree of October 4, 1922, explained that the Ministry of War had finally purchased

"in the municipalities of Getafe and Vaciamadrid, to D. José Espinós y Juliá, the 700 hectares of terrain that the commission appointed for choosing a site and delineating a protection zone for the establishment of a chemical products factory, with application to war, suggests for that purpose". [23] (see Figure 1)



**Fig. 1.** La Marañoso land plot. From left to right: village, old facilities, new facilities, Jarama river. Source: Muñoz, 2015.

One of the army officers who did a stage at the factory confirmed that the main reasons behind the election of La Marañoso had been its "remoteness from villages and agricultural

zones, and the existence of a large stripe of land owned by the factory as security zone”. [20] The site’s isolation, however, would create serious problems that delayed the opening of the factory and, ultimately, led to a general failure in gas production. A railway branch connecting the factory with the Madrid-Andalusia line at Getafe was never constructed. A whole new village with church, library, marketplace, water deposit, car repair workshop, offices, water supply and sewage system, military barracks and houses for army officers, workers and teachers had to be built “two kilometers away from the factory facilities, for reasons of hygiene and security”. However, the water for both the village and the factory had to be lifted “through a set of pumps because [the Jarama river] stood around 100 meters below the level of the factory terrain”. In such unfavorable conditions, a flow of water large enough for the massive production of chlorine and other chemical weapons could never be attained.

## 6 Conclusions

Spain’s chemical warfare in Morocco did not just comprise the production, transport, storage, and use of poison gases, but multiple material measures of domestic “containment” to protect workers, doctors, and the general population from the eventual effects of those substances. Such measures comprised, among others, the building of ventilated shell-filling workshops, the purchase and adaptation of protective-gear for the staff of yperite clinics and the election of remote sites for the establishment of gas production factories. These measures were not without shortcomings. La Marañosas’s shell-filling workshop was weakly automatized, and this circumstance reduced its output while continuing to expose workers to the effects of gases. The protective gear for hospital staff often arrived without instructions of use and had to be manipulated and adapted so that it served its purpose. The remote site where La Marañosas factory was built made it impossible to obtain a large water supply, thereby hindering the production of gases. Despite all, the extent and impact of these “matters of containment” should be considered in any historical account of Spain’s chemical warfare during the Rif War.

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