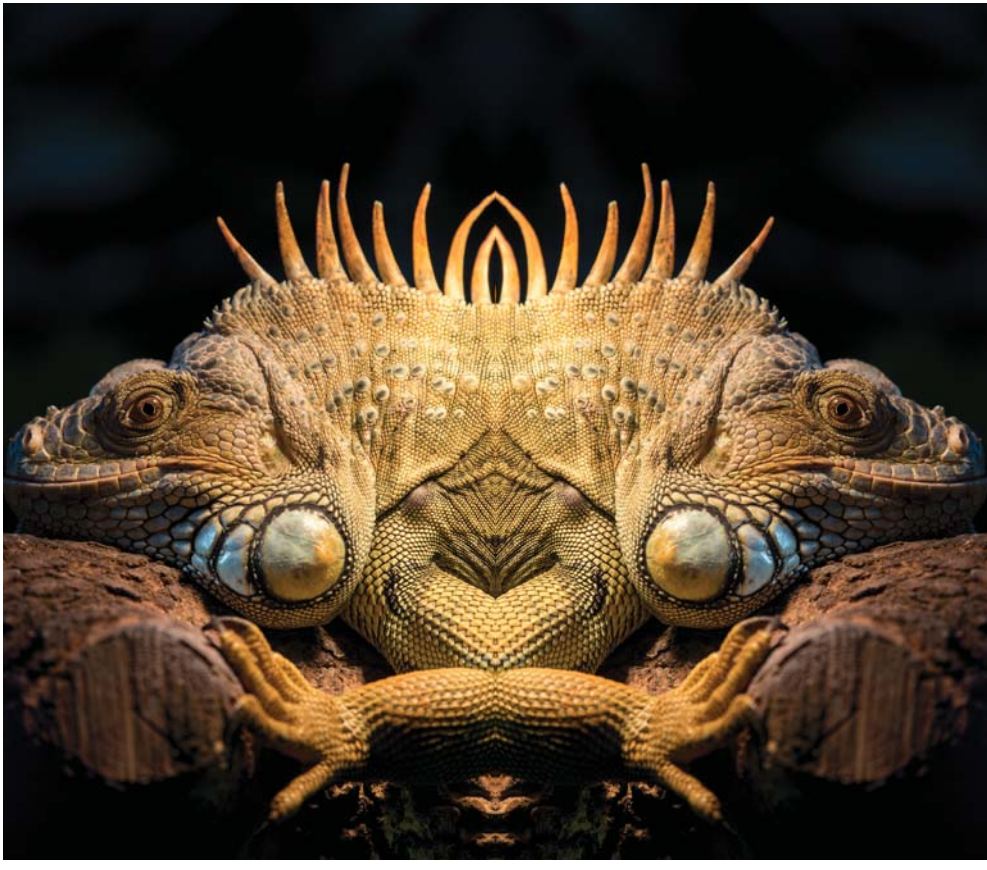
Biological Warfare

Another French Connection



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In memory of Jeanne Guillemin (1943-2019)

Abbreviations

ABC (group): Atome biologie chimie

ALN: Armée de libération nationale

ARMET: Bureau armement et études

Biopreparat: Main Directorate for Biological Preparations

BTWC: Biological and Toxin Weapons Convention

CAA: Centre des archives de l'armement et du personnel (Châtellerault, France)

CAS: Commandement des armes spéciales

CASDN: Comité d'action scientifique de la défense nationale

CEB: Centre d'études du Bouchet

CEECB: Commission des études et expériences chimiques et bactériologiques

CERST: Centre d'exploitation du renseignement scientifique et technique

CIA: Central Intelligence Agency

CIAS: Commandement interarmées des armes spéciales

CIEECB: Commission interarmées d'études et d'expérimentations chimique et biologique

CINBC: Comité interarmées NBC

CIR: Comité interministériel du renseignement

CREBC: Centre des recherches et études biologiques et chimiques

CRSSA: Centre de recherche du service de santé des armées

CWC: Convention on the Prohibition of the Development, Production and Stockpiling and Use of Chemical Weapons and on their Destruction

DAT: Direction des armements terrestres

DCSSA: Direction centrale du service de santé de armées

DMA: Délégation ministérielle pour l'armement

DOD: U.S. Department of Defense

DPAI: Direction des programmes et des affaires industrielles de l'armement

DRET: Direction des recherches, études et techniques

DRME: Direction des recherches et moyens d'essais

DTAT: Direction technique des armements terrestres
EFAB: Établissement de fabrication d'armements de Bourges
GIAT: Groupement industriel des armements terrestres
INRA: Institut national de la recherche agronomique
LCA: Laboratoire central de l'armement
LMRV: Laboratoire militaire de recherches vétérinaires
NBC (group): Nucléaire biologie chimie
ONERA: Office national d'études et de recherches aéronautiques
UN: United Nations
NATO: North Atlantic Treaty Organization
TNO: Nederlandse organisatie voor toegepast-natuur-wetenschapelijk
RVO: Rijksverdedigingsorganisatie
SBVA: Service biologique et vétérinaire des armées
SEBC: Section d'études de biologie et de chimie
SGETB: Sous-groupe de travail et d'études biologiques
SHD: Service historique de la défense
SGDN: Secrétariat général de la défense nationale
STAT: Section technique de l'armée de terre

Foreword by Jeanne Guillemin[1]

In 1874, representatives of the world's nations convened in Brussels on a mission of peace, to discuss the laws and customs of war. It was a time of crisis. The rise of national armies and technologically advanced weaponry in the 19th century had expanded the dimensions of warfare beyond all previously known limits. The innovations based on industrial-age science, for all their material benefits, were helping cause unprecedented battlefield carnage, the destruction of terrains, the destabilization of commerce, and peril to civilians. In addition to improved battleships, the better-designed rifles, mobile heavy artillery, and the invention of machine guns—innovations irresistible to the state militaries that could afford them—allowed new levels of military aggression as yet unfettered by international law. The efficiency of railroads and the telegraph, boons to commerce, accelerated the movement of troops and supplies in war.

At stake in this new epoch of warfare was nothing less the balance of power in Europe and the West in general. In 1853 the Crimean War pitted the Russian empire against the French and British for sovereignty over the declining Ottoman

[1] JEANNE GUILLEMIN (1943-2019) was a medical anthropologist and an author. Professor of Sociology at Boston College for 25 years and, for more than ten years, a senior fellow in the Security Studies Program at Massachusetts Institute of Technology, she was an authority on biological weapons and published four books on the subject. Jeanne Guillemin was a member of the jury for the present author's doctoral thesis (defended at the Sorbonne in July 2011), on which this book is largely based.

Empire and cascaded into more turf wars after the war, notorious for its "butchery," ended in 1856. The American Civil War, after repeated battlefield massacres and the burning of Atlanta, positioned the United States as an international economic power. The War of 1870 had consolidated German state power and cost France Alsace and parts of Lorraine.

The Brussels Convention and its peaceful mission had just a few precedents. The 1856 Declaration of Paris that ended the Crimean War promoted world agreement about the wartime protection of neutral nations on the high seas. In the midst of the American Civil War, the 1864 Red Cross Convention called for the protection of doctors, nurses, and others caring for sick and wounded soldiers. During the same conflict, President Abraham Lincoln mandated the adoption of the Lieber Code, to establish general rules of land warfare to bring order to a scale of battle never before experienced on American soil. Among other stipulations, the rules held the military responsible for the humane treatment of prisoners of war and ordered criminal prosecution for transgressions, and they forbade the use of poisons as "beyond the pale" of civilized nations.

The Brussels Conference introduced the possibility that a nation, although intent on victory in war, might agree to restraints on its choice of armaments or, going further, resist the exploitation of technologies that promised new advantages. What would be the motivation for any such international agreement? The 1868 Declaration of St. Petersburg had already spoken directly to that question. Reacting against the development of an explosive rifle bullet, the nations agreeing to that accord also supported a higher humanitarian order to govern the laws of armed conflict. To put enemy forces *hors de combat* was a legitimate goal of war, but for a weapon or a tactic to cause unnecessary suffering (like the "*maux superflus*" of enlarged bullet wounds) was deemed unacceptable to civilized nations.

Looking to the future, the participants at the Brussels Conference were concerned about the future use of poisons in war. The role of chemicals in the production of weapons was well established and the idea that wind-borne toxic fumes might have weapons potential was not far-fetched. Gun powder produced sickening sulfur fumes on battlefields; sulfuric acid was used to make nitric acid, which was then used to make mercury fulminate for percussion caps, which caused noxious smoke. In the 1860s, as the Lieber Code recognized, ideas were in play to make weapons of chloroform, hydrochloric acid, cyanide, arsenic, and nauseating smokes and stink bombs. Other toxic substances poised for military use were chlorine, hydrogen cyanide, cyanogen chloride, phosgene, and mustard agent, all discovered or synthesized in the late 18th and early 19th centuries.

Although avidly promoted by some scientists, these imagined weapons could not escape the age-old revulsion for poisons as malicious assaults on human physiology, contrary to fair and honorable combat. Yet just as embedded in tradition is poison's promised advantage of the surreptitious attack that fools the enemy. In Homer's *Odyssey*, before returning home to single-handedly slay the suitors of Penelope, Odysseus seeks and receives the gods' "fatal venom" for his bronze arrow tips. As befitting a hero, though, he battles the suitors with spears and arrows untainted by the "dread drug," as the poet called it. Unfortunately, in the larger panoply of modern warfare, notions of honorable face-to-face combat were fast eroding.

At Brussels, the understanding of the use of poison in warfare included the spreading of contagious disease on enemy territory. Even before germ theory, the conference participants could extrapolate from historic scenarios of the crude transmissions of diseases among unprotected enemy populations, whether by pitching the corpses of those who had died from plague over ramparts or distributing blankets

contaminated by smallpox victims. The poisoning of wells vital to troops and civilians alike was a known practice, an early form of sabotage.

The Brussels Conference set the stage for the Hague Conference of 1899, a major step forward in articulating laws based on universal principles to govern the conduct of war. As in Brussels, the delegates gathered at The Hague intended to reinforce the norm that the "right of belligerents to adopt means of injuring the enemy is not unlimited." Nations had the right to make and win wars, but to inflict violence on the defenceless or prolong suffering was morally reprehensible. Among more general provisions, the Hague Conventions delineated the rights of prisoners of war to humane treatment; affirmed the requirement that hospital ships be accepted as neutral and protected from any armed attack; and banned attacks on undefended nations, as a way of limiting expansionist aggression.

The Hague conventions also attempted to evaluate weapons on a moral plane, as a way of promoting voluntary state disarmament on humanitarian grounds. A key question was whether a particular tactic targeted the defenceless. In that light, the use of hot-air or helium balloons (in wide use for military aerial reconnaissance) to attack civilian populations was prohibited. So, too, was the use of expanding bullets (sometimes called Dum Dum bullets after the British factory in India that produced them), again for the unnecessary suffering they caused those already wounded in combat.

Similarly, Article 23 (a) of the Hague Conventions banned the use of projectiles of "smoke and noxious gas" in war. The hope was that the ban would deter states from developing a new arsenal that could cause indiscriminate mass harm to soldiers, as futuristic as chemical warfare still seemed at the time.

The 1907 Hague Conventions extended the 1899 provisions beyond their original five-year limit and made some

important additions. The Third Hague Convention of 1907, for example, banned "the crime of surprise attack," that is, one state's armed assault upon another. It required instead a clear, five-point declaration of war. The convention did not forbid unexpected military or naval attacks within the context of war, only an initial sudden aggression. Nonetheless, it underscored the importance of keeping warfare subject to legal boundaries. Forty-four nations agreed to the conventions which, in time, became interpreted not only as legally binding accords but, transcending that, as a summary of customary laws governing war that could apply even to those nations that had not signed.

Despite idealistic efforts to restrain armed conflict, in 1914 Europe blundered into World War I and another round of weapons innovations and seemingly boundless destruction began. This time, long-range mortar, tanks, submarines with torpedoes, and fighter airplanes expanded the dimensions of battle.

Despite the Hague Convention ban on the use of poisons, World War I saw the introduction of chemical weapons to overcome the impasse of trench warfare with airborne toxins. In the first month of the war, the French made an ineffective attack on German troops with tear gas. Then, in April 1915 at Ypres in Belgium, the German military organized the first significant chemical warfare attack by releasing 167 tons of chlorine gas from a line of 5,700 pressure cylinders. Carried by the wind, the toxic emission passed in minutes to the French and British trenches and quickly killed or incapacitated thousands, most of them colonials. This stunning assault and others by the Germans provoked a vigorous arms race, like nothing before in history in its engagement of industry, academia, and the military. Laboratory scientists in all the belligerent nations—Germany, Britain, Italy, Russia, Austro-Hungary, and later the United States—competed for increasingly potent chemicals, with the number

of candidate agents examined reaching the tens of thousands. Phosgene, a lung irritant like chlorine but six times more poisonous, was the Allies' preferred agent, while the Germans relied on the less volatile diphosgene. By far the most important chemical agent was mustard gas, a blistering agent invented and mass produced by the Germans in 1916. Despite the development and distribution to troops of protective gas masks and blankets, chemical attacks became a new symbol of the horrors of modern war, adding blindness, infected burns, and death by asphyxiation to the nightmarish scenarios of bloody battlefields.

By this time, the science of microbiology was approaching the stage of development that would open it to exploitation for military ends, following the trajectory of chemistry in the previous several decades. *Bacillus anthracis*, the same bacterium used to prove germ theory in the 1890s, was employed by the German military in World War I to covertly infect Allied pack animals being shipped from the Americas; other German sabotage aimed at spreading anthrax and glanders behind enemy lines in Europe. The possibilities of biological warfare loomed in popular science fiction, as if waiting to become reality.

By the war's end in 1918, alarm about the widespread devastation it had caused generated a rise in public support for international cooperation; even if it meant the subjugation of national sovereignty to a global agenda, the goal of peace seemed worth that price. A major consequence was the creation of the League of Nations, a new institutional means to prevent war, based on a commitment to mutual protection among members and a new Permanent Court of International Justice to adjudicate conflicts.

As part of the League's mission, the family of nations addressed the question of disarmament and urged member states to give up weapons inherently in violation of humanitarian norms. Article 8 of the League's Covenant declared

optimistically that "the maintenance of peace requires the reduction of national armaments to the lowest point consistent with national safety and the enforcement by common action of international obligations."

Chemical weapons were high on the list of dispensable armaments, with public outrage against World War I's chemical warfare driving the movement for an international ban. The Treaty of Versailles which ended the First World War already banned Germany's renewed use of poisons, in a reaffirmation of the Hague Conventions. The acrimony towards chemical weapons also found a place in the other accords among the Allied powers. The 1922 Treaty of Washington in particular included a general prohibition of poison warfare. Although that treaty never came into force, it proved a preliminary to the 1925 Geneva Protocol, the international prohibition of the use of chemical and bacteriological weapons in war. The Protocol, which repeated the Washington Treaty text nearly verbatim, forbade "asphyxiating, poisonous or other gases, and of all analogous liquids, materials or devices" already "justly condemned by the general opinion of the civilized world" and "universally accepted as part of International Law, binding alike the conscience and the practice of nations."

A discussion about the danger of germ warfare began in the lead up to the Washington Treaty and was continued as national representatives debated the phrasing of the Geneva Protocol. It was well understood that the intentional replication of microbes might cause pandemics endangering civilians as well as troops. The 1918 influenza epidemic had killed 20 million people worldwide and the wartime spread of cholera, dysentery, and sleeping sickness had also had catastrophic consequences. Note was made that rapid public health responses (like quarantine or vaccinations) could mitigate the impact of a bacteriological attack. Yet, if Germany rearmed, it might exploit its strong legacy of biomedical

research well beyond sabotage or minor assaults. In addition, the new Soviet Union, an outlier in arms negotiations, was suspected of mobilizing its laboratories for germ weapons research. As a precaution, the Geneva Protocol prohibition was extended to "the use of bacteriological methods of warfare."

The idealistic post-war phase, embodied by the League of Nations and its peace initiatives, remained troubled by fears of Germany's possible rearmament and renewed belligerence. Nowhere were these trepidations more acutely felt than in France, an Allied victor but one that had paid a high price in the loss of lives and still lived with bitter memories of the War of 1870. As superbly described in *La guerre biologique*,[2] in 1922 the French government, deeply conscious of the existential threat to its border and endowed with extraordinary scientific resources, became the first among the major powers to explore the modern potential of biological weapons, that is, the dissemination of pathogens and toxins at the indiscriminate, mass level nearly achieved in the battlefield use of chemicals. With this venture, a new epoch in the history of warfare technology began, with the perceived national security value of anti-civilian weapons in direct conflict with humanitarian norms. On the remote horizon was the colossal exploitation of physics to create the atomic bomb, to which the modern development of germ weapons was the direct antecedent.

As an indication of the support for international law in the interwar years, the 1925 Geneva Protocol was widely embraced, with 43 nations became parties; the British Empire, France, Italy, Germany, and the Soviet Union leading the way. Given the ambiguities of the times, the treaty could not offer a complete guarantee against proliferation.

[2] The title of the first publication in French of this book (2017).

The option remained for state parties to develop, produce and use chemical and germ weapons if they believed (as did the French) that they were under serious threat and would need to retaliate in kind to a first strike by an enemy power. Two important nations, the United States and Japan, failed to join the treaty, which, in different ways, weakened its import. In an isolationist phase, the United States in principle espoused world peace and disarmament but, even as it refused membership in the League of Nations, it rejected ratification of the Protocol. Going further, the US Congress solidified support for the Chemical Warfare Service, sending an ambivalent message to the world community about its intentions. Meanwhile, Japan reserved its right to stand apart from the West and in the 1930s secretly developed both chemical and biological arsenals, which it would go on to use against China.

During the interwar years, the development of heavy aircraft that could bear the weight of bombs encouraged visions of strategic attacks that promised even greater efficiency in warfare: the destruction of behind-the-lines targets (cities, factories, bridges, electrical plants, and oil fields) vital to the enemy at the front was predicted to end wars quickly. When the Italian general Giulio Douhet imagined this new total war, he included not only high explosive bombing raids on enemy territory but chemical and bacteriological attacks that could ravage an entire country. Chemical and biological weapons, despite their obviously different agents, were believed to be equally amenable to dispersion by bomb or mechanical spray and both could be destructive of human, animal, and plant life.

In Aucouturier's work, the history of France's investment in germ weapons is at last presented with the depth of archival detail and analysis that this important story deserves. Among the other major powers that created biological weapons programs (the Soviet Union, Japan, Great Britain, and

the United States), none began as early as the French and with such significant scientific resources. France's superior microbiology, developed over decades at the Institut Pasteur, allowed a sophisticated evaluation of dangerous pathogens and research on the aerodynamics of germ dispersal essential to mass attack. Ethical issues had to be suppressed. The demand that military scientists live a double life, advocating health protection in public while secretly developing an offensive anti-civilian capability, was later imposed on thousands of scientists in other programs, not only in the larger ones but in initiatives in smaller states that arose during the Cold War in Israel, South Africa, Iraq, and other countries seeking a surprise advantage over their enemies.

With the advent of the Second World War and the German Occupation of France in 1940, those French who had been in charge of chemical and biological weapons entered a uniquely risky phase of converting to public health goals under an enemy force that, as it turned out, had little interest in their weapons expertise. The trajectory of France's program after World War II also proved unique. While the United States, Great Britain, and Canada continued their wartime tripartite sharing of CBW research and testing, France followed an independent course, with its advanced discoveries, developments, and aerial testing kept largely secret, this during the years it sought to acquire an atomic bomb, which it did in 1960, achieving the status of a nuclear power.

As with all military programs, support can wax and wane, depending on sometimes unpredictable influences. During the 1970s, French testing of chemical weapons intensified while its biological capability declined. The 1972 Biological Weapons Convention that banned their development, production, possession, and trade was closing the door that had opened fifty years before. It would take another twenty years before the 1992 Chemical Weapons Convention imposed the same restrictions on chemicals and, by demanding the

destruction of state stockpiles, ended the more than seventy years of legitimate modern "poison weapons."

Without this important volume, much of France's legacy—its use of science, its organizational intertwining of biological and chemical weapons, its relation to its colonies, especially Algeria, and its changing calculation of the worth of these weapons—would have been lost to history. What a loss that would have been! The proliferation of what we have come to call "weapons of mass destruction" has endangered the world for too many years. By knowing the history of biological and chemical weapons, we can begin to understand the political origins of proliferation, the mentality that propelled it, and, thankfully, how it ended with international accord. Although one can argue that nuclear weapons are of a demonstrably different type, the implementation of strong international restraints on them is essential to global safety. More documents may augment the story of France's adventures in the realm of biological and chemical weapons and oral testimonies may emerge that add detail. For now, nothing less than profound gratitude is owed to the author and publisher for giving us this civic-minded and civilizing book.