



REVISTA DEL COLEGIO DEL MÉDICOS VETERINARIOS DEL ESTADO LARA

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A History of Veterinarians and Biological Weapons During the World Wars

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Abstract

During the past century, veterinarians played important roles in both developing and guarding against the use of biological weapons. The causative agents of zoonotic diseases such as anthrax, tularemia, and plague were often developed as weapons. Therefore, veterinary researchers were invaluable for their knowledge and access to experimental animals. Veterinary schools and other institutions contributed to biological weapons programs in many nations, including the United States. This article briefly analyzes veterinarians' participation in biological weapons programs and agroterrorism surveillance during World War I and World War II. The article focuses on veterinarians in the United States, but includes information about veterinary participation on other nations as well.

Keywords: Veterinarians, biological weapons, wars

Resumen

Durante el siglo pasado, los médicos veterinarios jugaron importantes roles tanto en el desarrollo de armas biológicas como en la protección contra su uso. Los agentes causantes de enfermedades zoonóticas como el ántrax, la tularemia y la peste fueron con frecuencia desarrollados como armas. Por lo tanto, los investigadores veterinarios fueron invaluable por su conocimiento y su acceso a los animales de experimentación. Las escuelas de veterinaria y otras instituciones contribuyeron a los programas de armas biológicas en muchos países, incluyendo los Estados Unidos. En este artículo se analiza brevemente la participación de los médicos veterinarios en los programas de armas biológicas y vigilancia del agroterrorismo durante la Primera y la Segunda Guerra Mundial. El artículo se centra en los médicos veterinarios en los Estados Unidos, pero también incluye información sobre la participación veterinaria en otras naciones.

Palabras clave: Palabras clave: Veterinarios, armas biológicas, guerras.

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In histories of biological weapons (hereafter BW), veterinarians and veterinary institutions have been neglected. This is surprising, since most BW programs during the twentieth century focused on microorganisms of veterinary interest (such as anthrax, plague, and tularemia, for example). Another potential threat was agroterrorism, especially the use of foot-and-mouth disease targeting populations of food-producing animals. This article briefly analyzes veterinarians' participation in state-sponsored BW programs and agroterrorism surveillance during World War I and World War II. The analysis begins with a German BW program that targeted animals during World War I; then discusses the American-Canadian-British cooperative BW program during World War II. Two themes emerge from this analysis: the importance of existing civilian and military veterinary institutions in supplying experts and materials for the weapons programs; and the debate within the profession about the role of civilian veterinarians in surveillance for biocriminality and agroterrorism.

Targeting Animals and Developing Weapons Programs, 1914-1939

*The modern era of BW development, and its involvement with veterinary medicine, dates to World War I. In 1915, the German Army sponsored a crude anthrax weaponization program that targeted animals supplied to the Allies by neutral nations. (Wheelis 1998; Wheelis 1999)¹ This program used disease pathogens that targeted animals or were zoonotic (transmissible from animals to humans), and the same agents continued to be mainstays of BW programs until the Biological Weapons Convention agreement ended most state-sponsored programs in the 1970s. During World War I, American horses and mules, Norwegian reindeer, and pack animals from Argentina, Romania, Spain, and Mesopotamia moved supplies, artillery, and even soldiers from one place to another. (Farrar 1995)² The reindeer, for example, carried British supplies across Norway to Russia, an Allied combatant that also depended on Romanian horses. (Wheelis 1998)¹ Samples of sugar cubes, intended for pack animals, carried into Norway by a German spy in January 1917 still contained viable *Bacillus anthracis* spores when analyzed 80 years later. (Redmond et al 1998)³ Food animals, such as cattle, were targeted in neutral Spain and Argentina; so were American animals shipped from eastern ports to France. In the United States, civilian veterinarians were generally not aware of the danger. We would expect veterinarians to have been on the front line of surveillance for such diseases, but they were not informed about the covert activities suspected of the German operatives, nor did case reports of anthrax outbreaks appear in the major*

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veterinary journals or military veterinary communications.^a (As we will see, this pattern continued during World War II.)

The German program, which continued for almost two years before the Allies had discovered its full extent, depended on the availability of microbes and specialists from the Koch Institute for Infectious Diseases (Berlin) and the Army veterinary corps. This set the pattern for the years leading into World War II. American and British veterinary institutions—London’s Royal Veterinary College and Cornell University in New York, for example—often donated strains of anthrax and glanders derived from animals to laboratories creating BW. France also had a well-developed system of veterinary research institutes, university laboratories, and military research facilities that contributed to its mainly defensive BW program in the 1920s and 1930s. The German concentration on animals and zoonotic diseases guided the French program. The military Veterinary Research Laboratory (Paris, transferred to Maison-Alfort in 1938) conducted most of the early work on anthrax and glanders. Veterinary Lieutenant-Colonel Velu directed the Prophylaxis Laboratory and led the later biological weapons research; and a pair of less well-known veterinarians, Lieutenant-Colonels Soulié and Guillot, managed to hide documentary evidence of the biological weapons research program from the occupying Germans during World War II. French research focused mainly on zoonotic and animal pathogens as potential biological weapons—as did the state-sponsored programs of Britain and North America. (Lepick 1998)⁴

Veterinarians in the Trilateral Anglo-American BW Program During WW II

In the United States, veterinary scientists and institutions played important roles in the development of weapons and surveillance as the clouds of war gathered over Europe in the late 1930s. At the Army’s veterinary research laboratory, researchers tested the dispersal of B. anthracis spores transported by a standard aerial bomb; they also experimented with aerosols of Brucella and Pasteurella tularensis (later renamed Francisella tularensis). (Lepick 2006)⁴ This cooperative effort between veterinary scientists and the military matured in the late 1930s, laying the groundwork for veterinary participation in BW development during World War II.

^a *The American Veterinary Medical Association recorded no deliberations on the possibility of biological agents used against animals; nor did its major means of communication with American veterinarians, The Journal of the American Veterinary Medical Association, advise its readers to watch for unusual disease outbreaks among livestock.*

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After the Pearl Harbor bombing in December 1941, the British, Canadian, and American BW research programs formed a trilateral partnership aimed at defending against potential Japanese and German biological attacks. (Avery 1999)⁵ In this trilateral partnership, veterinarians cooperated with other scientists in interdisciplinary teams. American BW researcher Theodor Rosebury later remembered how exciting the war years were, when “bacteriologists, physiologist, pathologists, chemists, physicians, veterinarians, botanists, physicists, engineers, and machinists” worked together. (Rosebury 1949)⁶

American veterinarians Harry W. Schoening (Bureau of Animal Industry, U.S. Department of Agriculture [hereafter BAI]) and William Arthur Hagan (Dean of the Cornell Veterinary School) were particularly important to the cooperative development of anthrax weapons against livestock. The leading U.S. government veterinary officer at the time was A.W. Miller, the Chief of the BAI. Miller worked in secret cooperation with George Merck, head of the American pharmaceutical company of the same name, who directed the War Research Service and became Chairman of the United States Biological Warfare Committee during World War II. Schoening and Hagan both officially worked for Miller during the war (Hagan took a leave of absence from his position as Dean at Cornell in the early 1940s to serve as Miller’s “Special Consultant”).⁷ (Baker, Fincher & Bruner 1963) The BAI was a perfect “cover story” for veterinarians’ activities in the BW program: the BAI supervised national meat inspection and animal disease research, and this agency employed hundreds of veterinarians at this time. It was not unusual for veterinarians at the universities to work at the BAI for periods of time.

During 1942-43, the director of the American BW program, George Merck, sent Hagan and Schoening to Britain to help develop anthrax-laced cattle feed (Britain planned to drop the feed over Germany if invaded). (Avery 1999)⁸ Schoening was a member of the joint U.S.-Canadian Commission that administered the covert Canadian weapons facility at Grosse -Île, Quebec (an island in the St Lawrence seaway that had previously served as a quarantine station for immigrants from Ireland and the British Isles). Foot-and-mouth disease was an important focus of research at this facility, but Schoening and his colleagues also worked on B. anthracis and other pathogens. American veterinarians also participated in British field tests of B. anthracis at Gruinard Island off the coast of Scotland, a fact that came to light after the war had ended. (Anonymous 1947)⁹

As they had done during World War I, veterinary schools and institutions supplied microorganisms used in BW programs. Pathogens came from both local veterinarians and veterinary schools—in Britain, London’s Royal Veterinary

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College in London, for example. (Auerbach and Wright 1955)¹⁰ In the United States, Iowa State University and the National Veterinary Diagnostic Laboratory (located in Ames, Iowa) maintained a “library” of B. anthracis and other microorganisms dating back to the 19th century. Many of these microorganisms had been collected by civilian veterinarians from sick animals in the field; once in the laboratory, the organisms could be cultured and manipulated. Clearly, many veterinary institutions, military veterinarians, and even civilian veterinarians were involved with programs to develop and defend against BW.

Thus it is particularly interesting that civilian veterinarians were told so little about the threat of BW. As had happened during World War I, no discussion of surveillance for BW appeared in the major veterinary journals or on the programs of the major veterinary congresses. This reflected a disagreement among American veterinary leaders about how much information should be given to veterinarians who were not working directly in BW programs. William A. Hagan felt that veterinarians should be alerted to the possibility of BW targeting American livestock; but another eminent research veterinarian involved in BW, William H. Feldman of the Mayo Clinic, opposed any discussion at conferences or in veterinary journals of the pathogens being used for BW development. Any mention of the diseases anthrax, rinderpest, and foot-and-mouth disease worried Feldman. In September 1943, Hagan wrote to Feldman: “I am not so sure that you are right in thinking that foot-and-mouth disease and rinderpest ought not to be discussed at veterinary meetings at present. ...I think it might be well to “sensitize” the profession, calmly of course, to the possibilities that exist of those [diseases] being used against us as weapons of war.” Hagan reminded Feldman that “our practitioners are our first line of defense,” and veterinarians could be trusted “not to inflame the public.” (Hagan to Feldman 1943)¹¹ Nonetheless, almost no information about agroterrorism surveillance appeared in the veterinary journals, and civilian veterinary practitioners probably knew nothing about their profession’s participation in state-sponsored BW programs during World Wars I and II.

Conclusion

In this brief study of veterinarians and BW, two themes emerge clearly. First, we have seen the importance of existing civilian and military veterinary institutions in supplying experts and materials for the weapons programs. Veterinarians collected the microorganisms that would be studied, converted into weapons, and made into vaccines against BW. Veterinarians and laboratories in veterinary institutions in the USA, Britain, Canada, France and many other nations participated in state-sponsored BW programs. The wartime fear of a BW attack motivated them. After the war, most veterinarians moved to other types of

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research for moral reasons. As veterinary researcher Karl F. Meyer (a bubonic plague expert) later explained, “one didn’t like to get one’s hands dirty” working on BW (Daniel 1962)¹² However, it is clear that BW programs and the veterinary profession were closely related during times of war.

The other theme concerns the debate within the profession about the role of civilian veterinarians in surveillance for biocriminality and agroterrorism. Today, in our post-9/11 world, veterinarians are regularly instructed to watch for and report suspicious disease outbreaks. But this was not the case during most of the 20th century. Leaders of the veterinary profession in the United States debated the question privately and decided that the potential to cause panic among civilians outweighed the need to enlist civilian practitioners in BW surveillance. This change in attitude reflects a change in public discourse, at least in the United States, where the threat of a BW attack seems very real since 2001. Veterinarians are now openly on the “front lines” of animal disease surveillance, and we can expect this situation to continue in the future.

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Referencias

- 1.- Mark Wheelis, "First shots fired in biological warfare" (correspondence), *Nature* 395 (September 17, 1998): 213; Wheelis, "Biological warfare before 1914," in E. Geissler and J. E. van Courtland Moon, (eds), *Biological and Toxin Weapons: Research, Development and Use from the Middle Ages to 1945* [SIPRI (Stockholm international Peace Research Institute) Chemical and Biological Warfare Studies No. 18] (Oxford: Oxford University Press, 1999), pp. 8-34; "Biological Sabotage in World War I," in Geissler and Moon, *Biological and Toxin Weapons*, pp. 35-62.
- 2.- W.E. Farrar, "Anthrax from Mesopotamia to Molecular Biology," *Pharos Alpha Omega* 58, 2 (1995): 35-38.
- 3.- Caroline Redmond, Martin J. Pearce, Richard J. Manchee, and Bjorn P. Berdal, "Deadly Relic of the Great War," *Nature* 393 (25 June 1998): 747-748.
- 4.- Olivier Lepick, "French Activities Related to Biological Warfare," pp. 70-90 in Geissler and Moon, *Biological and Toxin Weapons*, (1999) see pp. 70, 74, 75.
- 5.- Donald Avery, "Canadian Biological and Toxin Warfare Research, Development and Planning, 1925-45," pp. 190-214 in Geissler and Moon, *Biological Weapons* (1999).
- 6.- Theodor Rosebury, *Peace or Pestilence: Biological Warfare and How to Avoid It* (New York: McGraw-Hill, 1949), pp. 195-6.
- 7.- Donald W. Baker, Myron G. Fincher, & Dorsey W. Brunner, "William Arthur Hagan," 1963; Cornell University ecommons, http://ecommons.cornell.edu/bitstream/1813/18636/1/Hagan_William_Arthur_1963.pdf, accessed 7 June 2013.
- 8.- Donald Avery, "Canadian Biological and Toxin Warfare Research, Development and Planning, 1925-45," pp. 190-214 in Geissler and Moon, *Biological Weapons* (1999).
- 9.- Anonymous, "Notes" *Veterinary Medicine* 42 (March 1947): 90.
- 10.- Sidney Auerbach and George G. Wright, "Studies on Immunity in Anthrax. VI. Immunizing Activity of Protective Antigen Against Various Strains of *Bacillus Anthracis*," *Journal of Immunology* 75, 2 (1955): 129-133, see p. 129.

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11.- William Hagan to William Feldman, September 13, 1943, in William Arthur Hagan Papers, Cornell University, Box 1. Also cited in Ellis Pierson Leonard, *In the James Law Tradition 1908-1948* (Ithaca NY: Cornell University Press, 1982), pp. 324-5.

12.- Edna Tartaul Daniel, "Karl F. Meyer: Medical Research and Public Health. Interviews with Dr. Karl F. Meyer," typescript, Bancroft Library, University of California Berkeley, 1962.

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