

Biological Warfare in the Premodern Era
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The use of toxins and pathogens in warfare is generally regarded as a phenomenon of the twentieth century. This is primarily due to the fact that the past century not only saw significant advancement in the ability to isolate and culture disease-causing microorganisms, but also large-scale warfare, which allowed for the application of these advancements. Indeed, biological warfare has certainly made tremendous strides due to modern scientific innovation. However, the use of biological weapons is not a recent development, but rather a tactic with roots in many past centuries of warfare.

Although it is unknown when the first episode of biological warfare in history took place, it may very well have been Hercules, the heroic demigod of Greek mythology, who “invented” the first biological weapon. After slaying the multi-headed serpent Hydra, Hercules cut open her body, and dipped his arrows in her venom. Throughout the rest of his life, these arrows served as a potent weapon for Hercules against a number of other mythological foes¹. Aside from the experiences of Hercules, numerous other examples of biological weapons can be found in Ancient Greek literature. According to myth, the god Apollo shot plague-inflicting arrows that decimated entire armies², while Odysseus, the hero of Homer’s *The Odyssey*, sailed to Ephyra to obtain a poisonous flower which would serve as “a fatal drug to dip his arrows in and poison the bronze points.”³

¹ Adrienne Mayor, *Greek Fire, Poison Arrows, and Scorpion Bombs: Biological and Chemical Warfare in the Ancient World*, (Woodstock, NY: The Overlook Press, 2003), 41-44.

² *Ibid.*, 49.

³ Homer, *The Odyssey*, trans. Robert Fitzgerald, (New York: Alfred A. Knopf, 1992), 9.

The prevalence of these poisoned arrows throughout Ancient Greek lore suggests that the idea of biological warfare, if not the actual practice of it, certainly existed at least several centuries before the Common Era. Outside of mythology, the first accounts of actual biological warfare also told of the use of deadly poisonous arrows in battle. Ancient texts show evidence of numerous groups who employed these weapons throughout Europe, Central Asia, the Middle East, China, and Africa.⁴ In the fifth century B.C., the Greek writer Herodotus came into contact with perhaps the most dangerous of these groups: the Scythians. His report of this encounter is one of the earliest that tells of a group wielding biological weapons.

The Scythians controlled a large region in Central Asia between the Black Sea and Eastern Mongolia. Interestingly enough, Scythian mythology stated that they were descended from the son of Hercules and a viper-woman whom Hercules encountered in Scythia, which helps to explain their affinity for poisoned arrows. Highly proficient archers, these nomadic warriors used a particular recipe for developing a poison called scythicon, which they used to coat their arrowheads. This incredibly potent substance consisted of the venom of poisonous vipers, human blood serum, and animal feces. The unfortunate victim who received a wound from a Scythian arrow suffered an excruciating and torturous death. Their blood cells disintegrated and their body would enter a state of shock. In all likelihood, the victim contracted an infection such as tetanus or gangrene shortly after the infliction. These potent biological weapons contributed to the Scythians' domination of Central Asia until about 300 A.D.⁵

In 326 B.C., as Alexander the Great and his army marched southward into modern-day India, they encountered resistance at the city of Harmatelia, part of the Mauryan Empire. The Sicilian historian Diodorus recorded that the Harmatelians had applied snake venom to their

⁴ Mayor, *Greek Fire*, 76.

⁵ *Ibid*, 78-82.

swords and arrows, and that these weapons were used with deadly effects. Even soldiers with the slightest wounds soon died in agony as the venom spread through their bodies. Alexander's men eventually took the city after discovering a plant that could be used as an antidote to the Harmateliens' poison, but nonetheless suffered tremendous casualties at the hands of these venomous weapons.⁶

At the time of Alexander's conquest, the Mauryan military strategist Kautilya wrote a book of advisement to King Chandragupta entitled *Arthashastra*. The book stressed that military goals should be achieved by any means necessary, and encouraged the use of natural toxins in warfare, giving several recipes for poisons which could be used against the enemy in a number of ways.⁷

From the sources available, it seems that coating weapons in deadly toxins was fairly prevalent in the ancient world, but biological warfare took on other forms as well. One of the most common forms involved poisoning the water supply of an enemy. The earliest documented case of this took place in 590 B.C. in Greece. At this time, a number of Greek city-states formed an alliance against the city of Kirrha known as the Amphictionic League to punish Kirrha for religious crimes against the god Apollo. While details of the story differ from one version to another, each account reports the use of hellebore roots to poison the city's water supply. The people of Kirrha received diarrhea from the tainted water, allowing their enemy to conquer the city relatively unopposed.⁸

The ancient Chinese are also thought to have carried out the practice of contaminating their enemy's water supplies with some frequency, particularly during the Warring States Period

⁶ *Ibid*, 88-90.

⁷ *Ibid*, 91.

⁸ *Ibid*, 100-103.

between the fifth and third centuries B.C.⁹. The use of poison in warfare coincided with the advice of the Chinese military strategist Sun-Tzu, when he wrote that “Subjugating the enemy’s army without fighting is the true pinnacle of excellence.”¹⁰ Aside from contaminating water sources, the Chinese employed poison in various other ways as well. Texts from the Ming dynasty tell stories of Chinese armies poisoning grain supplies and wine in order to defeat their enemies.¹¹

Often, ancient military leaders devised more creative methods of biological warfare. In the late second century B.C., a critical naval battle occurred between King Eumenes of Pergamum and Hannibal of Carthage. Although the Pergaminian ships greatly outnumbered those of Hannibal, the Carthaginian general developed a unique plan that would result in his victory. He ordered his men to capture as many poisonous snakes as possible and place them into clay pots.¹² The Roman historian Cornelius Nepos described the events that transpired at the battle in his biography *The Life of Hannibal*. Nepos writes that

As the rest of the Pergamenian ships bore hard upon the enemy, the earthen pots, of which we have previously spoken, began suddenly to be hurled into them. These, when thrown, at first excited laughter among the combatants, nor could it be conceived why such a thing was done; but when they saw their ships filled with serpents, and, startled at the strangeness of the occurrence, knew not what to avoid first, they put about their ships, and retreated to their camp upon the coast. Thus, Hannibal by his stratagem, prevailed over the force of the Pergamenians.¹³

Although a lack of evidence limits our understanding of biological warfare in the ancient world, the scattered accounts that historians have discovered reveal that the practice of biological warfare certainly existed, albeit in a very raw and simplistic form. However, as a result of the

⁹ Ralph D. Sawyer, *Fire and Water: The Art of Incendiary and Aquatic Warfare in China*, (Boulder, CO: Westview Press, 2004), 317.

¹⁰ Sun Tzu, *The Art of War*, trans. Ralph D. Sawyer (Boulder, CO: Westview Press, 1994), 175.

¹¹ Sawyer, *Fire and Water*, 339.

¹² Mayor, *Greek Fire*, 188.

¹³ Cornelius Nepos, *The Life of Hannibal*, [online] accessed 15 October 2007, available from <http://209.85.165.104/search?q=cache:DF8N7CCjwJsJ:shot.holycross.edu/courses/Sallust-Livy/S06/pdfs/Nepos-Hannibal-eng.pdf+nepos+eumenes+hannibal+site:.edu&hl=en&ct=clnk&cd=6&gl=us&lr=lang_en>, par. 51-53.

technological advancements of the Middle Ages, different methods of waging biological warfare would emerge.

The Middle Ages saw the invention of castles and an augmented importance in siege warfare. In many ways, siege warfare provided particularly conducive conditions for which to spread pathogens to larger numbers of enemies. In 1346, Mongol forces under the leadership of Janibeg Khan besieged the city of Kaffa, a major Genoese trading port. When the Mongol army fell victim to the bubonic plague, Janibeg and his troops were forced to withdraw. Before the withdrawal, however, Janibeg ordered his troops to catapult the cadavers of the plague victims into the besieged city. Soon afterward, a Genoese notary named Gabriele de Mussi, provided a detailed account of the incident.

The dying Tartars, stunned and stupefied by the immensity of the disaster brought about by the disease, and realizing that they had no hope of escape, lost interest in the siege. But they ordered corpses to be placed in catapults and lobbed into the city in the hope that the intolerable stench would kill everyone inside. What seemed like mountains of dead were thrown into the city, and the Christians could not hide or flee or escape from them, although they dumped as many of the bodies as they could in the sea. And soon the rotting corpses tainted the air and poisoned the water supply, and the stench was so overwhelming that hardly one in several thousand was in a position to flee the remains of the Tartar army. Moreover one infected man could carry the poison to others, and infect people and places with the disease by look alone. No one knew, or could discover, a means of defense.¹⁴

The effectiveness of this bombardment is often debated. Although evidence suggests that the Genoese within Kaffa did in fact contract the plague, it is unsure whether the rotting Mongol corpses were to blame, or if the plague was spread by means of flea-ridden rodents leaving the Mongol camp and entering the city.¹⁵ Regardless, this besiegement of Kaffa does represent one of the earliest well-documented attempts at biological warfare.

¹⁴ Gabriele de Mussi, as quoted in Mark Wheelis, "Biological Warfare at the 1346 Siege of Caffa" [online] accessed 9 October, 2007, available from <<http://www.cdc.gov/ncidod/EID/vol8no9/01-0536.htm>>, par 15.

¹⁵ Mark Wheelis, "Biological Warfare at the 1346 Siege of Caffa", par. 21.

Other, although less credible, accounts of possible biological warfare exist from this period. According to the 17th century historian Antoine Varrilas, in a siege against a Bohemian castle at Karlstein in 1422, Hussite forces reportedly hurled the corpses of their fallen troops along with “waste” into the castle. Varrilas notes that “The great stench made the teeth of the majority of the defenders fall out.”¹⁶ If the “waste” that Varrilas mentions was fecal matter, disease within the city could very well have resulted from the attack. However, if this “waste” was simply garbage or some other refuse, the effect would have essentially been negligible.

Another incident shrouded in ambiguity is the Russian siege of the Swedish-held city of Reval in 1710. Russian forces allegedly hurled their own plague casualties into the city, causing an outbreak of the disease amongst the city’s population. This episode, however, is based solely on rumor and is not documented in any primary source.¹⁷ Other accounts of armies hurling rotting carcasses and other potentially infectious material into besieged cities during the medieval and Renaissance periods exist, but much like the cases of Karlstein and Reval, these accounts are based primarily on rumors from the time and those who documented the cases typically wrote well after the supposed incidents occurred. The credibility of these reports is therefore very questionable.¹⁸ Nonetheless, it can be seen from these accounts that biological warfare presumably did occur to some extent, and that it was certainly in the consideration of authors and historians during these periods.

The Age of Discovery brought about tremendous changes in the New World, as the European powers began colonizing the New World. One of the most significant consequences of European colonization proved to be the severe depopulation of the Native Americans due to

¹⁶ as quoted in Mark Wheelis, “Biological warfare before 1914”, in *Biological and Toxin Weapons: Research, Development and Use from the Middle Ages to 1945*, ed. Erhard Geissler and John Ellis van Courtland Moon, (Oxford: Oxford University Press, 1999) 16.

¹⁷ Mark Wheelis, “Biological warfare before 1914”, 17.

¹⁸ *Ibid.*

European diseases. The natives especially feared smallpox, and this fear was well-founded. Smallpox outbreaks often killed more than fifty percent of infected tribes.¹⁹ In the first stages of infection, a victim typically experienced a high fever accompanied by severe head and body aches. Within days, the body became covered by a rash, which over time became pustular. About eight days after the rash developed, these pustules crusted over and in time, became scabs. Those fortunate enough to survive the disease usually faced severe disfiguration, as the scabs covered the body with deep, pitted scars.²⁰ European settlers used these fears of the natives to their own advantage. One settler, after calling a conference of local Indian chiefs, said to them “You know the smallpox. Listen: I am the smallpox chief. In this bottle I have it confined. All I have to do is to pull the cork, send it forth among you, and you are dead men. But this is for my enemies, and not for my friends.”²¹ Although this particular attack never materialized, this threat shows that the idea of intentionally spreading this disease was certainly conceivable for both the Europeans and the natives.

In 1763, British colonists at Fort Pitt did carry out an attempt to intentionally spread the smallpox virus to their Indian enemies. It occurred during Pontiac’s Rebellion, when a confederation of Indian tribes waged war on the British colonists. While under siege at Fort Pitt, Simeon Ecuyer, commanding officer at the fort, wrote to Col. Henry Bouquet that the conditions inside the fort had become crowded and that an outbreak of smallpox had occurred. Bouquet passed this concern along to the British commander in chief Jeffery Amherst.²² In an exchange

¹⁹ American Medical Association, “Smallpox as a Biological Weapon”, *The Journal of the American Medical Association*, Vol. 281, No. 22, (June 9, 1999), 2128.

²⁰ *Ibid*, 2129-2130.

²¹ H. H. Bancroft, *The Works of Hubert Howe Bancroft*, Vol. 28, *History of the Northwest Coast, Part Two: 1800-1846*, (San Francisco: The History Company, 1886), 176.

²² Elizabeth A. Fenn. “Biological Warfare in Eighteenth-Century North America: Beyond Jeffery Amherst”, *Journal of American History*, Vol. 86, No. 4 (March 2000) 1553-1554.

of letters, Bouquet and Amherst discussed the possibility of attempting to “inoculate the Indians by means of Blankets that may fall into their hands”.²³

Unbeknownst to Amherst and Bouquet, Captain Ecuyer’s men had already made preparations to execute this plan, and did so without an order from their superiors. William Trent, a trader who also commanded a militia within the fort, provides a description in his journal of the ensuing incident. Trent reports that a meeting took place between Indian and British representatives in which the natives attempted to convince the British to surrender the fort. The British politely declined, but Trent writes “Out of our regard to them, we gave them two Blankets and a Handkerchief out of the Small Pox Hospital. I hope it will have the desired effect.”²⁴ British General Thomas Gage signed an invoice for these items, revealing that the British command both approved of and paid for the act. The effectiveness of this plan is often disputed. Although the Indians outside of Fort Pitt did suffer from smallpox, there is some evidence that suggests that the disease might have been rampant in their ranks before being given the artifacts from the smallpox hospital.

While the incident at Fort Pitt is the only reliably documented case of biological warfare in the eighteenth and nineteenth centuries, a number of other accusations arose during this period. The first account of biological warfare in Colonial America occurred in 1710, during Queen Anne’s War. In this instance, the Iroquois Indians perpetrated the attack on an English army camped near a river. A Frenchman named Pierre Francios-Xavier de Charlevoix recounted an episode in which the natives threw animal pelts into the river, contaminating the army’s water

²³ Henry Bouquet, as quoted in Fenn, “Biological Warfare in Eighteenth-Century North America”, 1556.

²⁴ William Trent, “William Trent’s Journal at Fort Pitt, 1763”, *Mississippi Valley Historical Review*, Vol. 11, ed. A.T. Volwiler (1924) 390-413.

supply. According to Charlevoix's account, the English suffered many losses as a result from this attack.²⁵

Throughout the American Revolution, American soldiers accused the British of intentional smallpox contagion on numerous occasions. These accusations have never been proven, but General Washington seemed convinced that the British were responsible for the smallpox outbreak that ravaged the Continental Army at the siege of Boston and Quebec. The Continental Congress even held a meeting in which they heard the testimonies of several soldiers who stressed that the British had spread the disease throughout American camps.²⁶

While evidence as to whether or not the British were guilty of the charges brought forth against them is inconclusive, these cases provide some important insight into an interesting facet of biological warfare: the ethicality of its use throughout history. A Congressional hearing such as this would not have been warranted if the use of biological weaponry had been considered appropriate conduct during war in the eighteenth century. Upon first hearing the accusations, Washington and his aides regarded the claims with disbelief, thinking the British incapable of such an act.²⁷ Indeed, George Washington and the Second Continental Congress were not the first to question the morality of such attacks. Although the first international restrictions against the use of biological weapons did not occur until after the First World War, reservations regarding the use of these weapons have existed for nearly as long as the weapons themselves. The Ancient Greeks criticized the Scythians' use of poisoned arrows, considering it a cowardly and disgraceful form of fighting (while conveniently ignoring such use in their own mythology.)²⁸ Records even show that after contaminating the water supply of Kirrha, the

²⁵ Fenn, "Biological Warfare in Eighteenth Century North America", 1565.

²⁶ *Ibid*, 1567-1570.

²⁷ *Ibid*, 1568.

²⁸ Mayor, *Greek Fire*, 83.

members of the Amphictionic League established a rule amongst themselves prohibiting such attacks in the future.²⁹

Members of the Brahman caste of the Mauryan Empire echoed this sentiment against the use of biological weapons, drawing from an ancient Hindu text known as the *Laws of Manu*. The laws say of Brahmans, “When he fights with his foes in battle, let him not strike with weapons concealed (in wood), nor with (such as are) barbed, poisoned, or the points of which are blazing with fire.”³⁰

The late nineteenth century saw the establishment of the germ theory of disease. Inspired by the work of microbiologists such as Louis Pasteur, Robert Koch, and Edward Jenner, scientists began to classify and further study malignant bacteria. This greater knowledge led to an increased sophistication and potency of biological weapons moving into the twentieth century, when use of these weapons would become a much greater concern for society than it had been in centuries past. However, the century also saw the beginnings of international cooperation in attempting to curb the use of such weapons.³¹ Still, ongoing threats of biological warfare, particularly from terrorist groups, leave the future of biological warfare uncertain.

While there is no doubt that biological warfare, in one form or another, has existed for thousands of years, our understanding of it is somewhat limited due to a lack of substantial evidence. Before the early twentieth century, very few reliable accounts have been found that indicate an explicit use of biological weapons, particularly in East Asia. Historian David A. Graff, who specializes in Chinese and Japanese military history, acknowledges that although there are numerous cases in ancient China of armies suffering extraordinary losses due to disease,

²⁹ *Ibid*, 105.

³⁰ *Laws of Manu*, trans. G. Buhler, [online] accessed 10 October 2007, available at <<http://www.fordham.edu/halsall/india/manu-full.html>>, Ch. 7, par. 90.

³¹ Wheelis, “Biological warfare before 1914”, 33.

particularly the Tang army in the campaign against the kingdom of Nanzhao in the 8th century A.D., there is little evidence that suggests any deliberate attempt to spread disease to an opposing army. When asked about the lack of evidence indicating biological warfare in pre-modern China, Graff replied that

The scarcity of biological warfare is surprising, given that the scholars who recorded military events tended to focus on cunning stratagems that delivered victory at minimal cost to the victor. By way of explanation, I can point to the absence of a germ theory of disease (the failure of the Nanzhao campaigns was attributed to deadly miasmas inherent in the southern landscape) and a preoccupation with cosmological and geomantic manipulation that may have inhibited other approaches.³²

When examining the historiography surrounding biological warfare, a cautious and speculative approach must be taken with full recognition of the potential biases that exist. A major issue that arises when examining these records is that in many situations where accusations have been documented, it is difficult to prove whether the accused did in fact have any malicious intent to spread disease, or if the disease spread in these instances was a product of natural and unintentional means. From the evidence available, few cases of the deliberate practice of biological warfare can be proven.

For understandable reasons, the credibility of most historical records that suggest the use of biological weaponry before the twentieth century can easily be called into question. However, the many unfounded allegations of biological warfare that have surfaced over the past millennia cannot be completely disregarded, for they reveal to us what is perhaps the most powerful attribute of biological warfare: its ability to instill fear and paranoia in the minds of its potential victims. The existence of so many accusations shows that biological warfare was certainly quite prevalent in the imaginations of past writers and historians. A consistent theme throughout history seems to be that in every application of biological warfare, it has yet to

³² David A. Graff, interview by author, 17 October 2007, email.

achieve its potential for mass destruction. It has, however, seemed to consistently evoke terror amongst populations for as long as it has existed. By examining the many reported incidents of biological warfare, both founded and unfounded, it appears that it has served more effectively as a psychological weapon than a physical one.

The study of pre-modern biological warfare is hindered by both the availability and reliability of evidence. The evidence that is available suggests that this form of warfare occurred sporadically and without any consistency. The moral restraints that have discouraged its use throughout history, and the lack of an understanding until the turn of the nineteenth century of how germs are spread could be considered the major factors responsible for the infrequency of its use. Its use seems to be most common and destructive during periods when epidemics are rampant, and can be easily manipulated for use in warfare. With the available evidence, it is difficult to develop a conclusive study on the application of biological warfare in the pre-modern world. However, it is clear that it has been used by societies for thousands of years, and that it has maintained an ominous presence in the psyche of those living in the past, just as it does with those of us living today.

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