

# Biowar in Ancient Times

A  
DISCUSSION  
WITH  
ADRIENNE  
MAYOR  
BY  
STUART  
FLEMING

ON OCTOBER 14, 2004, I had the pleasure of introducing a lecture at the Museum entitled “Poison Arrows and Scorpion Bombs: Biological Warfare in Antiquity,” by Adrienne Mayor, author of the superbly researched *Greek Fire, Poison Arrows & Scorpion Bombs:*

*Biological and Chemical Warfare in the Ancient World*. The lecture’s topic struck two very personal chords with me.

In the early 1980s, I served on the American A-bomb Reassessment Program for Hiroshima and Nagasaki, and among my colleagues for that Program was one of the scientists who worked on the Manhattan Project. As I sat with Adrienne before the lecture, I was reminded of those times and the sad truth stated by Robert Cowley and Geoffrey Parker in 1996 that “today’s secret weapons have a nasty habit of becoming tomorrow’s universal threat.”

At the same time, because I have always been interested in the history of medicine and disease, I was intrigued by Adrienne’s observation that, even as late as 2002, Russia still had in frozen storage staggeringly large amounts of various strains of smallpox. That sent me in search of a story chronicled in Horace Walpole’s *British Traveller* of 1784. Apparently in 1759 the sexton of the Somerset village of Chelwood was preparing the grave at a funeral and by chance drove his spade into the casket of a man who had died of smallpox some 30 years before. Most of the inhabitants of the village were in attendance. So, as the sexton jumped back in dismay, everyone reeled from the nauseous stench that issued forth from the ground. Within three days, all but two folk in the whole village were smallpox victims, and scarcely a third survived to remember this dreadful happening.

This was a natural disaster; one that at the time no one would have been able to predict. How much sadder it is that



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some of humankind considers the infliction of such diseases on others as a justifiable weapon in times of war. That they have indeed done so, and in many different and ingenious ways, was the theme of Adrienne’s lecture; and given its particular relevance in today’s anxious world, I was delighted when she agreed to a Q&A session that would give her thoughts on ancient biowar an opportunity to reach *Expedition’s* readers.

**Q:** Having recently seen film footage of the dreadful effects of mustard gas on soldiers during the First World War, and the revulsion this stimulated among civilians throughout Europe, I was wondering if there were any “rules of war” in antiquity that forbade the use of biological weapons or tactics?

**A:** Historians have assumed that biowar was rarely waged in antiquity because of strong social taboos against poisons and other secret weapons. Another common assumption is that biological tactics were specifically forbidden in ancient codes of war and that these rules were generally adhered to. Perhaps as warfare has become more destructive and devastating, a nostalgic view of battle has developed. Despite a deep-seated aversion to unfair, cruel tactics and toxic weaponry in many ancient cultures, the evidence shows that such weapons were used and that the ancient attitudes toward them were complex and ambivalent.

In fact, written rules of war are rare and inconsistent. I found evidence of disapproval of poison weapons in ancient



The scene on this red-figure kylix depicts a battle between Scythian archers and Greek hoplites. The shield of the fallen hoplite is decorated with the image of a snake, perhaps to frighten enemies or magically deflect snake poison-tipped arrows. UPM #31-19-2, Perseus 1991.07.0133.

Greek, Roman, Indian, and Muslim traditions, but contradictions cloud the issue of what was deemed acceptable. For example, in Homeric Greek literature, there were two parallel paths of waging war. There was righteous warfare according to socially approved traditions, personified by the great champion Achilles; and there was crafty, ruthless war using secret weapons without ethical qualms, like that waged by Odysseus, who invented the Trojan Horse and dipped his arrows in poison. Informal rules of war in historical Greece, for example those governing the proper treatment of prisoners and civilians, were not always honored. Only two instances of written rules of combat are known in Greece, and only one of them concerns biological weaponry. The first, an agreement by combatants not to use arrows, was inscribed on a temple column during the Lelantine War in about 700 BC (projectile weapons being regarded as a form of cowardly ambush). The other occurred after an alliance of city-states had destroyed the besieged Greek city of Kirrha by poisoning the water in the 6th century BC. The alliance vowed to refrain from poisoning each other's water should they ever find themselves at war again.

**Q:** Given the respect accorded Odysseus's behavior in Classical literature, I'm not so surprised by your instances of Greek skullduggery. But are you saying that biowar tactics were universally practiced by all the major cultures of the ancient world?

**A:** The same moral tensions in the proper conduct of war can be found in two well-known military codes of ancient India. *The Laws of Manu* (500 BC–AD 150) forbid the use of arrows tipped with poison or fire, but recommends contaminating the enemy's food and water. The *Arthashastra*, a war treatise compiled for King Chandragupta (4th century BC), gives hundreds of recipes for toxic weapons, but also advises commanders to win "the hearts and minds" of enemies and to spare non-combatants.

Contradictions abound in Chinese rules of war as well. For instance, Sun Tzu's *Art of War* (ca. 500 BC) advocates deception and fire as weapons of terror, and several other war manuals describe how to create poison smoke bombs. But other Chinese codes of war (450–200 BC) ban ruses of war, weapons that cause cruel suffering, and the harming of civilians. Some

early Islamic writings on warfare deplore using chemical fire weapons based on petroleum and denying drinking water, but the Koran's injunctions to "show restraint" and "do not transgress limits" in battle are vague.

The Romans were equally ambivalent. Cicero's oft-cited laws of war (*On Duties* I. 34) only covered the legitimate grounds for initiating a military campaign, not its conduct or approved weapons. In 129 BC, after the Roman general Manius Aquillius ended a long war in Asia by poisoning the wells of several rebellious cities, the historian Lucius Florus declared his victory tainted by dishonor. Yet the Roman strategist Polyaeus advocated numerous biochemical stratagems, including well-poisoning, as a means of avoiding face-to-face battle with "barbarians."

**Q:** Did certain situations encourage, even justify the use of bioweapons?

**A:** We know that warrior cultures valued bravery and face-to-face fighting, and they also admired creative resourcefulness! But drawing the line between unconventional and reprehensible tactics proved difficult in practice. I imagine that in early antiquity, when a single day's pitched battle between equally armed and trained warriors was decisive, biological weapons may have been less of a temptation. But with the development of siegecraft and long, drawn-out wars, unfair and inhumane biological strategies became ever more attractive.

The justifications for biochemical options in antiquity will sound very familiar to us moderns. Self-defense was a time-honored rationale and bioweapons were often used as a last resort to repel invaders. The defenders of the fortified desert city of Hatra (near Mosul, Iraq) devised two highly effective biochemical defenses using local resources against the imperial Roman legions of Septimius Severus in the 2nd century AD. First they poured flaming naphtha to burn up the soldiers and their siege engines. Then they packed clay jars full of stinging scorpions and hurled them as the Romans attempted to scale the walls.

When a commander's army was outnumbered or facing forces superior in courage, skill, or technology, then biological weapons could give a real advantage. The uncertainties and casualties in a fair fight could be avoided altogether by deploying toxic weapons. That was the approach favored by the later Roman military writer Polyaeus who, as I mentioned earlier, so admired the clever Greek hero Odysseus as the model strategist.

**Q:** As you're talking, the siege of Rhodes in AD 1522, as described so graphically in Anthony Goodman's *The Shadow of God*, jumped into my head. It's a reality, isn't it, that during the siege of a city, a bioweapon will not differentiate soldiers and civilians?



The Roman fear of scorpion stings, snake bites, and the like is reflected in the number of herbal recipes for their treatment that can be found in Pliny's *Historialis Naturalia* (books XXIV and XV) and Dioscorides's *De Materia Medica*. In this folio from a 13th century AD version of the latter, attributed to Pseudo-Apuleius, African marigold (*Solago minor*) is prescribed as a cure for such health hazards, along with that of being bitten by a rabid dog. Courtesy of Österreichische Nationalbibliothek, Vienna: ms. 93, f. 71.

**A:** Not only in sieges, but also in civil wars and in conflicts with exotic "uncivilized" cultures, whole populations are demonized, and traditional constraints on vicious weapons and total war are set aside. Holy wars (such as in the Greek Sacred War against Kirrha in 590 BC when the first documented tactic of poisoning water occurred) and the quelling of rebellions (as when the Romans poisoned wells in Asia) are just two more situations that encouraged the use of bioweapons to target non-combatants as well as warriors. And of course, there are always ruthless leaders who have no compunctions about any weapon or strategy to win victory. Sometimes just the threat of a horrifying weapon, such as a particularly nasty arrow poison or the devastating "Greek fire," was enough to bring surrender without a battle.

In antiquity, it wasn't always the attackers who used bioweapons indiscriminately. The famous manual on how to

survive a siege, written by Aeneas the Tactician after the Peloponnesian War, advised defenders of cities to poison water and described how to create chemical incendiaries and noxious smoke to repel the besiegers.

**Q:** I know that several ancient texts, among them Pliny the Elder's encyclopedic *Natural History*, discuss a number of herbal and magical antidotes to poisons. But could there ever be any special defenses against the kinds of biochemical weapons you describe?

**A:** Well, part of the appeal of biochemical agents is that they are secret, unexpected weapons which take advantage of human biological vulnerability in ways that cannot be deflected or avoided. But with the knowledge of the myriad toxic agents that could be weaponized in the ancient world, there were active searches for defenses, antidotes, and treatments. Remedies for wounds inflicted by arrows poisoned with snake venom were the same as for snake-bite. Battlefield doctors rushed to suck out the wounds or to scrape iron rust and bronze verdigris mixed with myrrh into them. Myrrh was known to be antiseptic. Failing that, poultices of astringent plants were applied to draw out the venom. In India, when Alexander the Great's army was attacked with spears coated in snake venom, historians reported that his Hindu doctors saved some lives with a plant antidote.

People also attempted to develop resistance to venoms and other poisons. King Mithridates VI of Pontus (132–63 BC), Rome's deadliest enemy, pursued a systematic program of ingesting a daily mixture of many different toxins in order to achieve immunity to poisoning. In ancient India, the same military manuals that advised biochemical weapons also contained countermeasures against them, such as filtering contaminated water with clay and ashes, or charcoal, or purifying it with alcohol. The Roman soldiers who suddenly found themselves in a hail of scorpions at Hatra had no time to prepare the traditional defenses against the venom. Such defenses included shriveling scorpions by sprinkling them with poisonous monkshood powder or clogging the stinger by carefully spitting on it—difficult maneuvers while scaling a fortress wall!

**Q:** And what about defenses against the chemical combustibles, such as flaming pitch arrows or burning naphtha?

**A:** The traditional defense against projectiles of burning pine resin was to hang wet rawhide curtains over the wooden palisades, but other ancient fire retardants were recognized. Mithridates fireproofed his wooden towers with alum in 87 BC, while in 74 BC the city of Cyzicus on the Black Sea extinguished that same king's fire missiles by sponging their walls with vinegar. Vinegar could also help neutralize choking fumes. This fact was noted by Pliny, and the technique is

applied in modern skirmishes between riot police armed with tear gas and political dissidents who breathe through vinegar-soaked handkerchiefs. The ancient Indian war manual *Arthashastra* advised special salves and sticky saps to protect soldiers' eyes and skin against chemical aerosols.

As the Romans discovered at Hatra and other battles in the Middle East, petroleum incendiaries could not be quenched with liquid. Aeneas the Tactician suggested coating wooden siege engines with clay, horse's hair, and wet mud. But there was no advice for protecting men from the devastating napalm-like effects of naphtha weapons, which clung like flaming honey and even burned under water. On land, one might try to roll in sand or mud. At sea, the only defense against "Greek fire" was to drape a ship with masses of wet, heavy hides. It was not until about AD 850 that asbestos was discovered by the Muslims in Tajikistan. They wove the mysterious fibrous rock into uniforms impervious to flames.

**Q:** During your lecture, I was struck by how often the ancient writings on biowar practices in antiquity always seemed to have two faces, an open one of repugnance—presumably intended for public consumption—and a covert and bio-tolerant one. Could it be argued that, in our imperfect human world, this was just the nature of governance in times of war?

**A:** You're right, it seems that the temptation to resort to biological options to gain the advantage in war is nothing new and apparently universal. It's easy to maintain noble ideals in peace, but not so while under the stress of war. The Greek historian of the ferocious Peloponnesian War, Thucydides, remarked that the brutality of the total war "undermined the general laws of humanity" and those victories that were won by nefarious treachery were praised as intelligent. He concluded, "In times of peace, individuals and states follow higher standards . . . but war is a stern teacher."



In AD 296, the Roman emperor Constantine also used alum from the Black Sea area as a fire retardant to protect his wooden siege engines from the ravages of Persian naphtha. Courtesy of Dumbarton Oaks, Washington, DC.

Other Roman historians also expressed despair over the race to develop ever more fearsome weapons to intensify psychological terror and bring suffering and death on a scale far beyond what had once been expected from simple sharp and blunt weapons of the old days of hand-to-hand hoplite battles. As Appian, the historian of the wars between Mithridates and Rome, commented, “They left nothing untried that was within the compass of human energy.” The words of the philosopher Lucretius, writing in the violent 1st century AD, seem starkly modern: “Tragic discord gave birth to one invention after another and added daily increments to the horrors of war.”

**Q:** At times, researching for your book, *Greek Fire*, must have been quite a sobering experience. Do you feel the history of biochemical warfare gives us any reason to hope that we are not facing just as many horror stories in our own future?

**A:** Delving into the history of biological and chemical weapons was a melancholy adventure, but I did find some rays of hope. Revulsion for biological weapons arose alongside their development; even in mythology serious doubts about the morality of such weapons arose as soon as the first arrow was dipped in poison. In each ancient culture that I studied—Greece, Rome, India, and China—ambivalence toward such weapons was expressed. Many historians have argued that the ancient existence of those doubts can serve as the “moral backbone” for creating treaties against biochemical arms today. The English bioweapons historian, Julian Perry Robinson, suggests that the multi-cultural, multi-ethnic, and long-standing

“human impulse” against the hostile use of disease and poisons may be “our one remaining hope” against the drive to produce more and more dangerous new armaments. Leonard Cole, a leading American historian of modern biowar, has argued that the deep-seated aversion to poison weapons helps explain their relative rarity in the past.

A glimmer of hope—which, after all, was the last entity to emerge from Pandora’s Box of misfortunes—is also embedded in the ancient Greek myth of Hercules’s invention of poison arrows. After he killed the Hydra monster, he dipped his arrows in its venom and thereafter his quiver contained a perpetual supply of biological projectiles. When Hercules died—ironically of the very same Hydra poison that coated his arrows—he passed his quiver of poison arrows to a younger warrior named Philoctetes. Philoctetes himself suffered an agonizing wound from the arrows, but used them to win victory for the Greeks in the Trojan War. Yet when Philoctetes reached the end of his life, he decided not to pass the quiver on to the next generation. Instead he dedicated his weapons in a temple of Apollo, the god of healing. Thus the myth offers a model for ending the cycle of deadly weapons of mass destruction. 🏠

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“Hercules on his funeral pyre,” as depicted in a mid-5th century BC red-figure psykter. Courtesy of Private Collection, New York.

