

NOVA
ONLINE[Home](#) | [Search](#) | [Site Map](#) | [Previously Featured](#) | [Schedule](#) | [Feedback](#) | [Teachers](#) | [Shop](#)

BIOTERROR

History of Biowarfare

[Medieval Siege](#) | [American Revolution](#) | [WW I](#) | [WW II](#) | [Cold War](#) | [Soviet "Superbugs"](#) | [Iraq's Secret Weapons](#) | [The Cults](#) | [Anthrax Attacks](#)

Medieval Siege

In the 14th and 15th centuries, little was known about how germs cause disease. But according to medieval medical lore, the stench of rotting bodies was known to transmit infections. So when corpses were used as ammunition, they were no doubt intended as biological weapons.

Three cases are well-documented:

1340

Attackers hurled dead horses and other animals by catapult at the castle of Thun L'Eveque in Hainault, in what is now northern France. The defenders reported that "the stink and the air were so abominable...they could not long endure" and negotiated a truce.

1346

As Tartars launched a siege of Caffa, a port on the Crimean peninsula in the Black Sea, they suffered an outbreak of plague. Before abandoning their attack, they sent the infected bodies of their comrades over the walls of the city. Fleeing residents carried the disease to Italy, furthering the second major epidemic of "Black Death" in Europe.

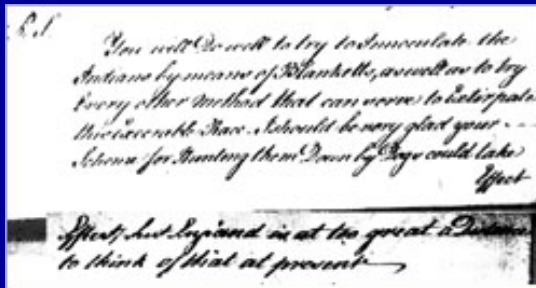
1422

At Karlstein in Bohemia, attacking forces launched the decaying cadavers of



When loaded with diseased bodies, wood-frame catapults were biological weapons.

men killed in battle over the castle walls. They also stockpiled animal manure in the hope of spreading illness. Yet the defense held fast, and the siege was abandoned after five months.



Gen. Jeffrey Amherst, in a letter dated 16 July 1763, approved the plan to spread smallpox to Delaware Indians.

American Revolution

While the first true vaccine for smallpox was not invented until 1796, the practice of deliberately inoculating people with a mild form of the disease was established decades earlier. The British military likely employed such deliberate infection to spread smallpox among forces of the Continental Army.

The British routinely inoculated their own troops, exposing soldiers to the material from smallpox pustules to induce a mild case of disease and, once they recovered, life-long immunity. But in Boston, and perhaps also Quebec, the British may have forced smallpox on civilians. As they fled the besieged cities these civilians, the British hoped, would carry smallpox to rebel troops.

In Boston the mission seems to have failed; the infected civilians were quarantined and thus kept from Continental soldiers. But in Quebec, smallpox swept through the Continental Army, helping to

prompt a retreat.

Using smallpox as a weapon was not unprecedented for the British military; Native Americans were the targets of attack earlier in the century. One infamous and well-documented case occurred in 1763 at Fort Pitt on the

Pennsylvania frontier. British Gen. Jeffery Amherst ordered that blankets and handkerchiefs be taken from smallpox patients in the fort's infirmary and given to Delaware Indians at a peace-making parley.

World War I

By the time of The Great War, the germ theory of disease was well established; scientists grasped how microbes such as bacteria and viruses transmit illness. During the war, German scientists and military officials applied this knowledge in a widespread campaign of biological sabotage.

Their target was livestock—the horses, mules, sheep, and cattle being shipped from neutral countries to the Allies. The diseases they cultivated as weapons were glanders and anthrax, both known to ravage populations of grazing animals in natural epidemics. By infecting just a few animals, through needle injection and pouring bacteria cultures on animal feed, German operatives hoped to spark devastating epidemics.

Secret agents waged this campaign in Romania and the U.S. from 1915-1916, in Argentina from roughly 1916-1918, and in Spain and Norway (dates and details are obscure). Despite the claims of some agents, their overall impact on the war was negligible.

The much more apparent horrors of chemical warfare led, in 1925, to the Geneva Protocol. It prohibits the use of chemical and biological agents, but not research and development of these agents.

The United States signed the Protocol, yet 50 years passed before the U.S. Senate voted to ratify it. Japan also refused to ratify the agreement in 1925.



After the war, cavalries were trained to expect attacks with chemical and biological weapons.

World War II

While Germany dabbled with



The Japanese army used Chinese prisoners to test bioweapons. (These particular men may not have been subjects.)

biological weapons in World War I, the Japanese military practiced biowarfare on a mass scale in the years leading up to and throughout World War II. Directed against China, the onslaught was spearheaded by a notorious division of the Imperial Army called Unit 731.

In occupied Manchuria, starting around 1936, Japanese scientists used scores of human subjects to test the lethality of various disease

agents, including anthrax, cholera, typhoid, and plague. As many as 10,000 people were killed.

In active military campaigns, several hundred thousand people—mostly Chinese civilians—fell victim. In October 1940, the Japanese dropped paper bags filled with plague-infested fleas over the cities of Ningbo and Quzhou in Zhejiang province. Other attacks involved contaminating wells and distributing poisoned foods. The Japanese army never succeeded, though, in producing advanced biological munitions, such as pathogen-laced bombs.

As the leaders of Unit 731 saw Japan's defeat on the horizon, they burned their records, destroyed their facilities, and fled to Tokyo. Later, in the hands of U.S. forces, they brokered a deal, offering details of their work in exchange for immunity to war crimes prosecution.

By the end of WWII, the Americans and Soviets were far along on their own paths in developing biological weapons.

Cold War

While ignited by World War II, bioweapons programs in the Soviet Union and the U.S. reached new heights in the anxious climate of the Cold War. Both nations explored the use of hundreds of different bacteria, viruses, and

biological toxins. And each program devised sophisticated ways to disperse these agents in fine-mist aerosols, to package them in bombs, and to launch them on missiles.

In 1969, the U.S. military celebrated the success of a massive field test in the Pacific. The wargame—involving a fleet of ships, caged animals, and the release of lethal agents—provided proof of the impact of bioweapons. Little did the U.S. team know, however, that Soviet spies were in nearby waters, collecting samples of the agents tested.



Weapons production at Fort Detrick, Maryland, the U.S. Army's base for biowarfare research.

At the end of 1969, likely prompted by Vietnam War protests, President Richard Nixon terminated the offensive biological warfare program and ordered all stockpiled weapons destroyed. From this point on, U.S. researchers switched their focus to defensive measures such as developing "air-sniffing" detectors.

In 1972, the U.S. and more than 100 nations sign the Biological and Toxin Weapons Convention, the world's first treaty banning an entire class of weapons. The treaty bars possession of deadly biological agents except for defensive research. Yet no clear mechanisms to enforce the treaty existed. And just as it signed the treaty, the Soviet Union fired up its offensive program.

Soviet "Superbugs"

In 1979, a rare outbreak of anthrax disease in the city of Sverdlovsk killed nearly 70 people. The Soviet government publicly blamed contaminated meat, but U.S. intelligence sources suspected the outbreak was linked to secret weapons work at a nearby army lab.

In 1992, Russia allowed a U.S. team to visit Sverdlovsk. The team's investigation turned up telltale evidence in the lungs of victims that many died from inhalation anthrax, likely caused by the accidental release of aerosolized anthrax spores from the military base. Given the hundreds of tons of anthrax

the Sverdlovsk facility could produce, the release of just a small amount of spores was fortunate.

News of the immensity of the Soviets' biological weapons program began to reach the West in 1989, when biologist Vladimir Pasechnik defected to Britain. The stories he told—of genetically altered "superplague," antibiotic-resistant anthrax, and long-range missiles designed to spread disease—were confirmed by later defectors like Ken Alibek and Sergei Popov.

The Soviet program was spread over dozens of facilities and involved tens of thousands of specialists. In the late 1980s and 1990s, many of these scientists became free agents—with dangerous knowledge for sale.

Iraq's Secret Weapons

As the Soviet Union's program began to crumble in the 1990s, and scientists' salaries dwindled, some bioweapons experts may have been lured to Iraq. Iraq launched its own bioweapons program around 1985 but initially lacked the expertise to develop sophisticated arms.

By the time of the Gulf War cease-fire in 1991, however, Iraq had weaponized anthrax, botulinum toxin, and aflatoxin and had several other lethal agents in development. Inspectors from the U.N. Special Commission (UNSCOM) spent frustrating years chasing down evidence of the program, which Iraq repeatedly denied existed. The UNSCOM team found that Iraq's stockpile included Scud missiles loaded to deliver disease.

Iraq is known to have unleashed chemical weapons in the 1980s, both during the Iran-Iraq war and against rebellious Kurds in northern Iraq. But there is no evidence that the Iraqi state has ever used its biological arsenal.

What is almost certain, though, is that this arsenal still exists in 2001. In fact, with the aid of former Soviet experts and UNSCOM inspectors kept at bay, the Iraqi arsenal is likely growing in power.



During Operation Desert Storm, the U.S. military feared that Scud missiles might contain biological agents.



The Aum Shinrikyo cult claimed tens of thousands of members.

The Cults

In 1984, followers of the Indian guru Bagwan Shree Rajneesh, living on a compound in rural Oregon, sprinkled *Salmonella* on salad bars throughout their county. It was a trial run for a proposed later attack. The Rajneeshees' scheme was to sicken local citizens and thus prevent them from voting in an upcoming election.

The trial attack was successful; it triggered more than 750 cases of food poisoning, 45 of which required hospitalization. The Centers for Disease Control and Prevention launched an investigation but concluded that the outbreak was natural. It took a year, and an independent police investigation, to discover the true source of the attack.

While this first bioterrorist act on American soil went almost unnoticed, a decade later the work of another cult sparked a flurry of media coverage and government response.

In 1995, the apocalyptic religious sect Aum Shinrikyo released sarin gas in a Tokyo subway, killing 12 commuters and injuring thousands. The cult also had enlisted Ph.D. scientists to launch biological attacks. Between 1993 and 1995, Aum Shinrikyo tried as many as 10 times to spray botulinum toxin and anthrax in downtown Tokyo.

Just why the attacks failed is not known, but some experts suspect the cult did not sufficiently refine the particle size of its agents and that it was working with an avirulent strain of anthrax.

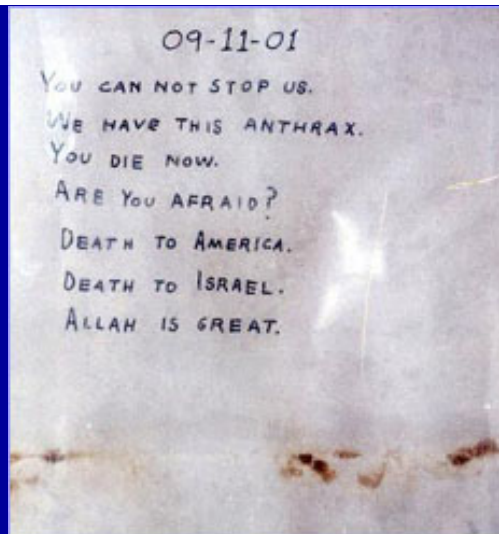
Anthrax Attacks

For more than two decades, bioterrorism experts warned that America may be vulnerable to attack with biological weapons. In the fall of 2001, these warnings took on a new

urgency.

A week after the terrorist attacks of September 11th, a letter containing anthrax spores was mailed to Tom Brokaw at NBC News in New York. Two other letters with nearly identical handwriting, venomous messages, and lethal spores arrived at the offices of the *New York Post* and Senator Tom Daschle in Washington, D.C.

By the end of the year, 18 people had been infected with anthrax, five people had died of the inhaled form of the disease, and hundreds of millions more were struck by anxiety of the unknown.



When these letters were opened, the fine-grained anthrax within them misted into the air.

As *New York Times* reporter Judith Miller notes in NOVA's "Bioterror," the anthrax-laced letters sparked "mass disruption" rather than "mass destruction."

But the story is continuing to unfold.

Photos: (1) WGBH/NOVA; (2,5) National Archives and Records Administration; (3) Native Web, www.nativeweb.org; (4, 6-10) Corbis Images.

 [Printer-Friendly Format](#)  [Feedback](#)

[History of Biowarfare](#) | [Future Germ Defenses](#)
[Interviews with Biowarriors](#) | [Global Guide to Bioweapons](#) | [Making Vaccines](#)
[Resources](#) | [Teacher's Guide](#) | [Transcript](#) | [Site Map](#) | [Bioterror Home](#)

[Search](#) | [Site Map](#) | [Previously Featured](#) | [Schedule](#) | [Feedback](#) | [Teachers](#) | [Shop](#)
[Join Us/E-Mail](#) | [About NOVA](#) | [Editor's Picks](#) | [Watch NOVAs Online](#) | [To Print](#)
[PBS Online](#) | [NOVA Online](#) | [WGBH](#)

© | Updated February 2002