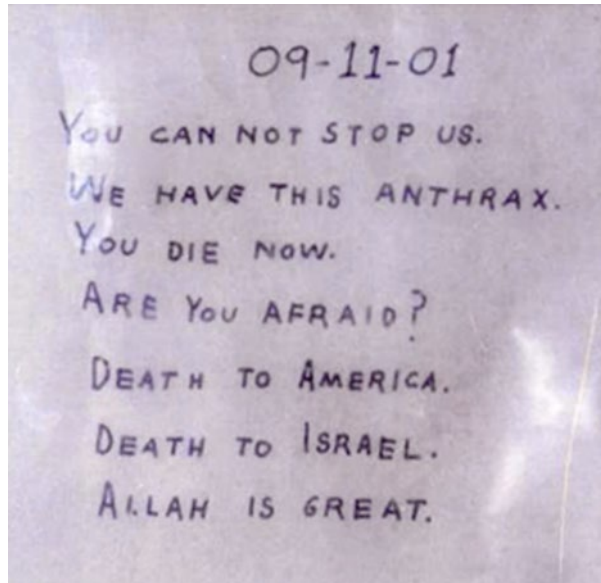


STANDARD DEVIATIONS: From There to Here

Greetings,

The origin story of the United States Federal Select Agent Program (FSAP) is bound not to the tragedy of 9/11, but to bioterrorism with the anthrax letters that followed in the next month after 9/11, Amerithrax.



{One of the letters containing anthrax spores sent in 2001.}

We need to look a bit farther back in history to appreciate the program's evolution.

A bioterrorism attack is the deliberate release of viruses, bacteria, or other biological agents used to cause illness or death in people, animals, or plants. It's been used for millennia.

- 400 BC. Scythian archers used arrows dipped in blood and manure or decomposing bodies.
- 190 BC. Hannibal hurled venomous snakes onto enemy ships.

In 1155, Frederick I (Holy Roman Emperor and King of Italy, 1155-1190) poisoned the waters of towns during the Second Crusade with dead bodies. Indeed, using dead bodies proved quite effective against an enemy.

In 1346, Tartars catapulted bubonic plague–infected bodies into Caffa (now Ukraine). The retreat of Genoese forces may have exacerbated the spread of plague throughout Europe. And catapulting plague cadavers onto an enemy continued for hundreds of years.



As late as 1863, Confederate forces poisoned wells and ponds with dead animals to thwart Union troops in Mississippi.

Smallpox was another weapon of bioterrorism. Whether intentional or not is unclear, but Pizzaro gave out infected clothing and blankets to South American natives in the 15th century. Without any immunity to the novel pathogen, huge numbers of indigenous peoples died. It was used deliberately during the French-Indian War (1754-1767) against Indians hostile to the British. And Civil War records show that the strategy was used by Kentucky Confederates, too.

Even Louis Pasteur experimented with salmonella as a rat poison.

The first international attempt to control chemical and biological weapons occurred in 1874, when the International Declaration Concerning the Laws and Customs of War was signed in Brussels and included a prohibition against poison or poisoned arms. In 1899, and 1907, The Hague Peace Conferences ratified proposals to ban poisoned projectiles in warfare.

The proliferation of chemical weapons over the next few years escalated from chlorine gases to phosgene and mustard agents. But biologicals were more covert. Germans attacked with bacteria aimed at horses and cattle using Glanders (*Burkholderia mallei*) and anthrax. 1915 is considered to be the beginning of 20th-century biological warfare. The use of these weapons is well documented.

But, like the Civil War, disease killed so many during WWI that the effect of weaponized biologicals is difficult to measure.

The U.S. retaliation against the German program was the distillation of ricin from castor beans. It was loaded into artillery shells to disperse in a ricin dust cloud.



{Stokes mortar w/ricin shells.}

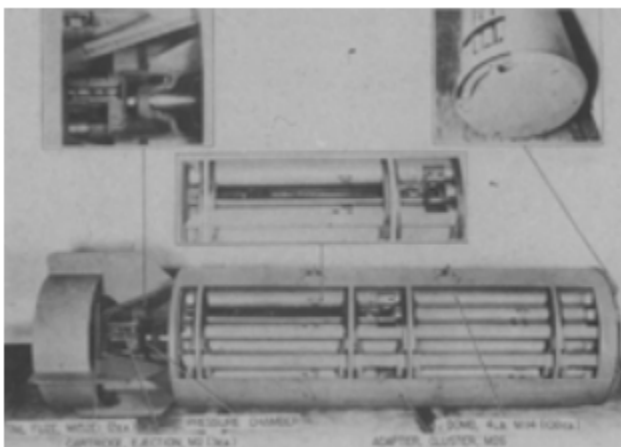
The 1925 Geneva Protocol condemned the use of gas and bacteriological weapons. Twenty eight countries signed on; the U.S. Senate refused.



The progress of weaponizing biologicals has not been near as prolific as the development of chemical warfare. The German and Japanese forces advanced a lot of the science using cholera, dysentery, typhoid, plague, anthrax and paratyphoid meant to be used in foods or contaminate water during the 30's and 40's. The American response was the Biological Warfare Committee (1944) at Detrick Air Field around Frederick, Maryland.

Camp Detrick (now Fort Detrick) produced botulinum toxin, anthrax spores, brucella and a slew of antipersonnel, antianimal, and antiplant pathogens through 1945. Anthrax was considered the most important agent, and it was tested in large (100+ lb.) bombs. An overriding priority was given to anthrax production into the 50's.

Yellow fever virus was propagated and tested, as a mosquito vector-borne agent. Rinderpest, foot and mouth disease, and wheat stem rust were also standardized as weapons.



{500 lb. biological cluster bomb.}

By the 60's, biological warfare research was in decline. Despite cutbacks, *Pasteurella tularensis* was standardized as a freeze-dried pellet that could be frozen and stored. Wheat stem rust and rice blast disease testing was conducted in the Midwest and testing of some biologicals was done in airports, subways, and bus terminals on humans and in stockyards around the country.

It wasn't until 1969 that public and congressional opinion shifted away from biological weaponry. President Nixon renounced biological weapons, recognized the 1925 Geneva Protocols, and limited research to defensive measures only. Supposedly, this stopped production in the States.

And then came 2001.

In October 2001, bioterrorism in the U.S. became a reality when four letters laced with anthrax were sent through the U.S. Postal Service. The attacks resulted in the illness in 22 people, the death of 5, and fear and anxiety in millions of others. The cost of decontaminating offices that were exposed totaled over \$23 million.



The writing had already been on the wall. In 1995-96, An Aryan Nations member illegally obtained *Yersinia pestis* by mail order. Congress passed the *Antiterrorism and Effective Death Penalty Act of 1996* requiring HHS to publish regulations for the transfers of select agents that have the potential to pose a severe threat to public health and safety. And that starts the ball rolling.

After the 2001 anthrax attacks resulted in 5 deaths, Congress beefed up oversight of select agents with the *USA PATRIOT Act* in 2001 and the *Public Health Security and Bioterrorism Preparedness and Response Act* of 2002 requiring HHS & USDA to publish regulations for possession, use, and transfer of select agents.

President Bush (2009) signed an executive order (EO 13486 *Strengthening Laboratory Biosecurity in the United States*) which solidified biosecurity as a national priority.

Then, in 2010, President Obama signed another Executive Order (EO 13546 *Optimizing the Security of Biological Select Agents and Toxins in the United States*) which created the tier platform designating the Tier 1 agents, established security standards and the infrastructure we know today.

Table 1. Examples of biological and chemical warfare use during the past 2000 years

Time	Event
600 BC	Solon uses the purgative herb hellebore during the siege of Krissa
1155	Emperor Barbarossa poisons water wells with human bodies in Tortona, Italy
1346	Tartar forces catapult bodies of plague victims over the city walls of Caffa, Crimean Peninsula (now Feodosia, Ukraine)
1495	Spanish mix wine with blood of leprosy patients to sell to their French foes in Naples, Italy
1675	German and French forces agree to not use "poisoned bullets"
1710	Russian troops catapult human bodies of plague victims into Swedish cities
1763	British distribute blankets from smallpox patients to Native Americans
1797	Napoleon floods the plains around Mantua, Italy, to enhance the spread of malaria
1863	Confederates sell clothing from yellow fever and smallpox patients to Union troops during the US Civil War
World War I	German and French agents use glanders and anthrax
World War II	Japan uses plague, anthrax, and other diseases; several other countries experiment with and develop biological weapons programs
1980-1988	Iraq uses mustard gas, sarin, and tabun against Iran and ethnic groups inside Iraq during the Persian Gulf War
1995	Aum Shinrikyo uses sarin gas in the Tokyo subway system

{Biological warfare and bioterrorism: a historical review, S. Riedel, MD, PHD}

Have a great week and be safe,

Bryan

