

US military released bacteria to test biological warfare

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San Francisco. Justin Sullivan/Getty Images

On September 20, 1950, a US Navy ship just off the coast of San Francisco used a giant hose to spray a cloud of microbes into the air and into the city's famous fog. The military was testing [how a biological weapon attack would affect the 800,000 residents of the city](#).

The people of San Francisco had no idea.

The Navy continued the tests for seven days, [potentially causing at least one death](#). It was one of the first large-scale biological weapon trials that would be conducted under a "germ warfare testing program" that went on for 20 years, from 1949 to 1969. The goal "was to deter [the use of biological weapons] against the United States and its allies and to retaliate if deterrence failed," [the government explained later](#). "Fundamental to the development of a deterrent strategy was the need for a thorough study and analysis of our vulnerability to overt and covert attack."

Of the 239 known tests in that program, San Francisco was notable for two reasons, according to Dr. Leonard Cole, who documented the episode in his book "[Clouds of Secrecy: The Army's Germ Warfare Tests Over Populated Areas.](#)"

Cole, now the director of the Terror Medicine and Security Program at Rutgers New Jersey Medical School, tells Business Insider that this incident was "notable: first, because it was really early in the program ... but also because of the extraordinary coincidence that took place at Stanford Hospital, beginning days after the Army's tests had taken place."

Hospital staff were so shocked at the appearance of a patient infected with a bacteria, *Serratia marcescens*, that had never been found in the hospital and was rare in the area, that they [published an article](#) about it in a medical journal. [The patient, Edward Nevin](#), died after the infection spread to his heart.



Bacillus subtilis, then known as Bacillus globigii, was one pathogen that was used in testing.[WMrapids/Wikimedia Commons](#)

S. marcescens was one of the two types of bacteria the Navy ship had sprayed over the Bay Area.

It wasn't until the 1970s that Americans, as Cole wrote in the book, "learned that for decades they had been serving as experimental animals for agencies of their government."

San Francisco wasn't the first or the last experiment on citizens who hadn't given informed consent.

Other experiments involved [testing mind-altering drugs](#) on unsuspecting citizens. In one shocking, well-known incident, government researchers [studied the effects of syphilis on black Americans](#) without informing the men that they had the disease — they were told they had "bad blood." Researchers withheld treatment after it became available so they could continue studying the illness, despite the devastating and life-threatening implications of doing so for the men and their families.

But it was the germ warfare tests that Cole focused on.

"All these other tests, while terrible, they affected people counted in the hundreds at most," he says. "But when you talk about exposing millions of people to potential harm, by spreading around certain chemicals or biological agents, the quantitative effect of that is just unbelievable."

"Every one of the [biological and chemical] agents the Army used had been challenged" by medical reports, he says, despite the Army's contention in public hearings that they'd selected "harmless simulants" of biological weapons.

"They're all considered pathogens now," Cole says.

Here are some of the other difficult-to-believe germ warfare experiments that occurred during this dark chapter in US history. These tests were documented in Cole's book and verified by Business Insider using congressional reports and archived news articles.

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From Minneapolis to St. Louis



A C-119 Flying Boxcar, one type of plane used to release chemicals. [Official USAF photo](#)

The military tested how a biological or chemical weapon would spread throughout the country by spraying bacteria as well as various chemical powders — including an especially controversial one called zinc cadmium sulfide. Low flying airplanes would take off, sometimes near the Canadian border, "and they would fly down through the Midwest," dropping their payloads over cities, says Cole.

These sprays were tested on the ground too, with machines that would release clouds from city rooftops or intersections to see how they spread.

In the book, Cole cites military reports that documented various Minneapolis tests, including one where chemicals spread through a school. The clouds were clearly visible.

To prevent suspicion, the military pretended that they were testing a way to mask the whole city in order to protect it. They told city officials that "the tests involved efforts to measure ability to lay smoke screens about the city" to "hide" it in case of nuclear attack, according to Cole's account.

The potential toxicity of that controversial compound zinc cadmium sulfide is debated. One component, cadmium, [is highly toxic](#) and can cause cancer. [Some reports suggest](#) a possibility that the zinc cadmium sulfide could perhaps degrade into cadmium, but a 1997 report from the National Research Council [concluded that the Army's secret tests](#) "did not expose residents of the United States and Canada to chemical levels considered harmful." However, the same report noted that research on the chemical used was sparse, mostly based on very limited animal studies.

These air tests were conducted around the country as part of Operation Large Area Coverage.

"There was evidence that the powder after it was released would be then located a day or two later as far away as 1,200 miles," Cole says. "There was a sense that you could really blanket the country with a similar agent."



St. Louis. Joe Raedle/Getty Images

City tests were conducted in St. Louis, too.

In 2012, Lisa Martino-Taylor, a sociology professor at St. Louis Community College-Meramec, [released a report](#) theorizing that the army's experiments could be connected to cancer rates in a low-income, mostly black neighborhood in the city where zinc cadmium sulfide had been tested. She said she was concerned that there could have been a radioactive component to some testing, though she did not have direct evidence for that possibility.

Her report, however, prompted both senators from Missouri to write to the Army secretary, "demanding answers," the Associated Press [noted at the time](#).

While Martino-Taylor's suggestion remains purely hypothetical, "the human dimension is never mentioned" in most Army documents, Cole writes in the book. Instead there's just a discussion of how well the particulates spread and what they learned about the possibility of biological attacks from them.

1966: "A Study of the Vulnerability of Subway Passengers in New York City to Covert Attack with Biological Agents"



The Times Square subway station during rush hour. Stephen Chernin/Getty Images

The New York subway system experiments are among the most shocking in terms of the numbers of people exposed, according to Cole.

In a [field test called "A Study of the Vulnerability of Subway Passengers in New York City to Covert Attack with Biological Agents,"](#) military officials tried to see how easy it would be to unleash biological weapons using the New York City subway. They would break light bulbs full of bacteria on the tracks to see how they spread through the city.

"If you can get trillions of bacteria into a light bulb and throw it on the track as a train pulls into a station, they'll get pulled through the air as the train leaves," Cole says, travelling through the tunnels and into different stations.

Clouds would engulf people as trains pulled away, but documents say that they "brushed their clothing, looked up at the grating apron and walked on." No one was concerned.

In a 1995 *Newsday* story, reporter Dennis Duggan contacted retired Army scientist Charles Senseney, who had testified about the experiments to a Senate subcommittee in 1975. [In his testimony](#), he explained that one light bulb full of bacteria dropped at 14th Street easily spread the bacteria up to at least 58th Street.

But he declined to reveal anything to the *Newsday* reporter. "I don't want to get near this," Senseney said to Duggan. "I [testified], because I was told I had to by the people at the Department of Defense ... I better get off the phone."

Experiments continued in New York for six days using *Bacillus subtilis*, then known as *Bacillus globigii*, and *S. marcescens*.

A paper from the [National Academy of Sciences analyzing military experiments](#) notes that *B. globigii* is "now considered a pathogen" and is often a cause of food poisoning. "Infections are rarely known to be fatal," the report

said — though fatal cases have occurred.

Particularly controversial tests



A US Navy vessel at Norfolk Supply Center, the location of a particularly controversial experiment. U.S. Navy photo by Bill Campbell

Another controversial experiment described in Cole's book involved a test at the Norfolk Naval Supply Center. The experimenters packed crates with fungal spores to see how they would affect the people unpacking those crates.

Cole's book notes that "portions of a report about an army test in 1951 involving *Aspergillus fumigatus* ... indicate that the army intentionally exposed a disproportionate number of black people to the organism." Most of the employees at the supply center were black.

In the military reports cited by Cole, researchers claim they are preparing for an attack that might target black citizens. He quotes from a section that reads: "Since Negroes are more susceptible to coccidioides than are whites, this fungus disease was simulated."

When these experiments were first revealed in 1980, the racial aspect of these tests engendered controversy and skepticism about the "army's interest in the public welfare," according to Cole.

Tests revealed by an unexpected source

UNCLASSIFIED



U.S. ARMY ACTIVITY

IN THE U.S.

BIOLOGICAL WARFARE PROGRAMS

VOLUME I

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UNCLASSIFIED

An unclassified report on the Army's germ warfare activities. [U.S. Army Activity in the U.S. Biological Warfare Programs](#)

Many of these experiments on the American public were first investigated by what we would consider questionable sources.

[One 1979 Washington Post news story](#) discusses open air experiments in the Tampa Bay area involving the release of pertussis, or whooping cough, in 1955. State records show that whooping cough cases in Florida spiked from 339 (one death) in 1954 to 1,080 (12 deaths) in 1955, according to that story.

But it's hard to trace how accurate the information about the whooping cough release is: The only documentation goes back to an investigation by the Church of Scientology.

The Church of Scientology formed a group called American Citizens for Honesty in Government that spent a significant amount of time investigating controversial experiments run by the Army and CIA, according to the Post. Through FOIA requests they uncovered a number of documents related to these experiments in the late 1970s.

Cole understands why some people are skeptical of those reports. "I certainly am not a member and I think a lot of what they do is quackery," he says, but "in this case, I have no reason to believe any of this isn't real."

Many of the documents Scientologists made public were the same documents he'd received doing his own research, redacted in the same places.

Perhaps the hardest question is how much information is still missing.

As Cole writes in the book:

Many details about the army's tests over populated areas remain secret. Most of the test reports are still classified or cannot be located, although a few of the earlier ones have become available in response to Freedom of Information Act requests and in conjunction with the Nevin case. Among those available, sections have been blocked out and pages are missing.

What we learned





The "Cold War mentality" was one of persistent fear. [via blog.uprinting.com](http://blog.uprinting.com)

Military officials were called to testify before Congress in 1977 after information about these biological warfare experiments was revealed.

At the time, those officials said that determining just how vulnerable the US was to a biological attack "required extensive research and development to determine precisely our vulnerability, the efficacy of our protective measures, and the tactical and strategic capability of various delivery systems and agents," according to [a record of that testimony](#) quoted in "Clouds of Secrecy."

Cole too says it's hard to see these events now from the perspective that people had then.

There was "a different mindset in the country then ... [a] Cold War mentality," he says. But, he argues, that doesn't justify glossing over the already known potential danger of the agents used.

At the same time, part of what the military knows about how clouds of chemicals spread comes from these experiments. Cole says that knowledge gleaned from these biological warfare testing programs helped inform the US reaction when reports came in on the potential use of chemical weapons in the first Gulf War.

So what's happening now?



We now have different fears as a society. Jason Reed/Reuters

Cole says that the obvious question that's on people's minds is what's happening now. After all, if secret tests could occur then, what prevents them from continuing? Are they, in fact, still going on?

He doesn't think it's likely.

"I would never swear on your life or my life that nothing illegitimate is happening, but based on what I do know, I don't have any sense that there's illicit activity now that would involve risking exposure to tons of people, as happened in the 50s and 60s," he says.

Biological agents are still studied and tested, but informed consent is more widely appreciated now. There's also less of a Cold War mentality that would be used to justify this research.

Still, more recent reports show that experiments in this area went on longer than we thought.

In 2001, a [New York Times report revealed](#) projects testing biological weapons that began under the Clinton administration and continued under the second Bush administration. A 1972 treaty theoretically prohibited developing biological weapons, but this program justified it with the argument that new weapons needed to be studied in order to develop adequate defenses.

And the "War on Terror" raises other concerns, according to Cole.

After the 2001 anthrax attacks, funding for bioterrorism research spiked by \$1.5 billion. Then [in 2004, Congress approved](#) another \$5.6 billion bioterror research project.

These projects are meant to protect society from the dangers of biological agents, but they may have an unintended consequence, Cole says.

"Thousands and thousands of people became familiar with pathogens that they were not familiar with before," he says. "You now have many more people that could potentially do bad with these organisms, and it only takes one person."