

# Of Microbes and Mock Attacks: Years Ago, The Military Sprayed Germs on U.S. Cities

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SAN FRANCISCO -- Fifty-one years ago, Edward J. Nevin checked into a San Francisco hospital, complaining of chills, fever and general malaise. Three weeks later, the 75-year-old retired pipe fitter was dead, the victim of what doctors said was an infection of the bacterium *Serratia marcescens*.

Decades later, Mr. Nevin's family learned what they believe was the cause of the infection, linked at the time to the hospitalizations of 10 other patients. In Senate subcommittee hearings in 1977, the U.S. Army revealed that weeks before Mr. Nevin sickened and died, the Army had staged a mock biological attack on San Francisco, secretly spraying the city with *Serratia* and other agents thought to be harmless.

The goal: to see what might happen in a real germ-warfare attack. The experiment, which involved blasting a bacterial fog over the entire 49-square-mile city from a Navy vessel offshore, was recorded with clinical nonchalance: "It was noted that a successful BW [biological warfare] attack on this area can be launched from the sea, and that effective dosages can be produced over relatively large areas," the Army wrote in its 1951 classified report on the experiment.

Now, with anthrax in the mail and fear mounting of further biological attacks, researchers are again looking back at the only other time this country faced the perils of germ warfare -- albeit self-inflicted. In fact, much of what the Pentagon knows about the effects of bacterial attacks on cities came from those secret tests conducted on San Francisco and other American cities from the 1940s through the 1960s, experts say.

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"We learned a lot about how vulnerable we are to biological attack from those tests," says Leonard Cole, adjunct professor of political science at Rutgers University in New Jersey and author of several books on bioterrorism. "I'm sure that's one reason crop dusters were grounded after Sept. 11: The military knows how easy it is to disperse organisms that can affect people over huge areas."

In other tests in the 1950s, Army researchers dispersed *Serratia* on Panama City, Fla., and Key West, Fla., with no known illnesses resulting. They also released fluorescent compounds over Minnesota and other Midwestern states to see how far they would spread in the atmosphere. The particles of zinc-cadmium-sulfide -- now a known cancer-causing agent -- were detected more than 1,000 miles away in New York state, the Army told the Senate hearings, though no illnesses were ever attributed to them as a result.

Another bacterium, *Bacillus globigii*, never shown to be harmful to people, was released in San Francisco, while still others were tested on unwitting residents in New York, Washington, D.C., and along the Pennsylvania Turnpike, among other places, according to Army reports released during the 1977 hearings.



**Edward J. Nevin**

In New York, military researchers in 1966 spread *Bacillus subtilis* variant Niger, also believed to be harmless, in the subway system by dropping lightbulbs filled with the bacteria onto tracks in stations in midtown Manhattan. The bacteria were carried for miles throughout the subway system, leading Army officials to conclude in a January 1968 report: "Similar covert attacks with a pathogenic [disease-causing] agent during peak traffic periods could be expected to expose large numbers of people to infection and subsequent illness or death."

Army officials also found widespread dispersal of bacteria in a May 1965 secret release of *Bacillus globigii* at Washington's National Airport and its

Greyhound bus terminal, according to military reports released a few years after the Senate hearings. More than 130 passengers who had been exposed to the bacteria traveling to 39 cities in seven states in the two weeks following the mock attack.

The Army kept the biological-warfare tests secret until word of them was leaked to the press in the 1970s. Between 1949 and 1969, when President Nixon ordered the Pentagon's biological weapons destroyed, open-air tests of biological agents were conducted 239 times, according to the Army's testimony in 1977 before the Senate's subcommittee on health. In 80 of those experiments, the Army said it used live bacteria that its researchers at the time thought were harmless, such as the *Serratia* that was showered on San Francisco. In the others, it used inert chemicals to simulate bacteria.

Several medical experts have since claimed that an untold number of people may have gotten sick as a result of the germ tests. These researchers say even benign agents can mutate into unpredictable pathogens once exposed to the elements.

"The possibility cannot be ruled out that peculiarities in wind conditions or ventilation systems in buildings might concentrate organisms, exposing people to high doses of bacteria," testified Stephen Weitzman of the State University of New York, in the 1977 Senate hearings.

For its part, the Army justified its experiments by noting concerns during World War II that U.S. cities might come under biological attack. To prepare a response, the Army said, it had to test microbes on populated areas to learn how bacteria disperse.

"Release in and near cities, in real-world circumstances, were considered essential to the program, because the effect of a built-up area on a biological agent cloud was unknown," Edward A. Miller, the Army's secretary for research and development at the time, told the subcommittee.

But in at least one case -- the bacterial fogging of San Francisco -- the research may have gone awry. Between Sept. 20 and Sept. 27 of 1950, a Navy mine-laying vessel cruised the San Francisco coast, spraying an aerosol cocktail of *Serratia* and *Bacillus* microbes -- all believed to be safe -- over the famously foggy city from giant hoses on deck, according to declassified Army reports. According to lawyers who have reviewed the reports, researchers added fluorescent particles of zinc-cadmium-sulfide to better measure the impact. Based on results from monitoring equipment at 43 locations around the city, the

Army determined that San Francisco had received enough of a dose for nearly all of the city's 800,000 residents to inhale at least 5,000 of the particles.

Two weeks after the spraying, on Oct. 11, 1950, Mr. Nevin checked in to the Stanford Hospital in San Francisco with fever and other symptoms. Ten other men and women checked in to the same hospital -- which has since been relocated to Stanford University in Palo Alto, Calif. -- with similar complaints. Doctors noticed that all 11 had the same malady: a pneumonia caused by exposure to bacteria believed to be *Serratia marcescens*. Mr. Nevin died three weeks later. The others recovered. Doctors were so surprised by the outbreak that they reported it in a medical journal, oblivious at the time to the secret germ test.

After the Army disclosed the tests nearly three decades later, Mr. Nevin's surviving family members filed suit against the federal government, alleging negligence. "My grandfather wouldn't have died except for that, and it left my grandmother to go broke trying to pay his medical bills," says Mr. Nevin's grandson, Edward J. Nevin III, a San Francisco attorney who filed the case in U.S. District Court here.

Army officials noted the pneumonia outbreak in their 1977 Senate testimony but said any link to their experiments was totally coincidental. No other hospitals reported similar outbreaks, the Army pointed out, and all 11 victims had urinary-tract infections following medical procedures, suggesting that the source of their infections lay inside the hospital.

The Nevin family appealed the suit all the way to the U.S. Supreme Court, which declined to overturn lower court judgments upholding the government's immunity from lawsuits.

Today, the U.S. military is again patrolling San Francisco's coastline, guarding against someone who might try to copy the Army tests of half a century ago. Local officials say such an attack is unlikely, given the logistical problems of blasting the city without Navy ships.

Partly as a result of Mr. Nevin's death, says Lucien Canton, director of San Francisco's emergency services, "one thing we now know is that it takes an awful lot of stuff to produce casualties, especially in a place like San Francisco that always has a stiff breeze."

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