

FACT CHECK by Kris Newby, author of “BITTEN: The Secret History of Lyme Disease and Biological Weapons.”

No, Lyme disease is not an escaped military bioweapon, despite what conspiracy theorists say

By Sam Telford
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Could Lyme disease in the United States be the result of an accidental release from a secret bioweapons experiment? Could the military have specifically engineered the Lyme disease bacterium to be more insidious and destructive — and then let it somehow escape the lab and spread in nature? Is this why 300,000 Americans are diagnosed annually with this potentially debilitating disease?

It's an old conspiracy theory enjoying a resurgence with lots of sensational headlines and tweets. Even Congress has ordered that the Pentagon must reveal whether it weaponized ticks.

And it's not true.

Ticks can indeed carry infectious agents that could be used as biological weapons. Military research has long focused on ticks. Sites around Long Island Sound, near the military's Plum Island research lab, were some of the first places where the American Lyme disease epidemic was identified.

But there was no release of the Lyme disease agent or any other onto American soil, accidental or otherwise, by the military.

I started working on Lyme disease in 1985. As part of my doctoral thesis, I investigated whether museum specimens of ticks and mice contained evidence of infection with the bacterial agent of Lyme disease before the first known American human cases in the mid-1970s.

False. Many gov't documents and eyewitness accounts confirm that the U.S. entomological weapons program developed methods to deploy infected fleas, ticks, and mosquitoes on enemies.^{1,2,3,4}

False. There are at least 32 known live biological agent and/or simulant releases during the military's open-air biowarfare testing, including tick-borne tularemia (UL) in Alaska, in Utah, and on Baker Island, a U.S. territory near Hawaii.^{5,6,7}

Working with microbiologist David Persing, we found that ticks from the South Fork of Long Island collected in 1945 were infected. Subsequent studies found that mice from Cape Cod, collected in 1896, were infected.

So decades before Lyme was identified — and before military scientists could have altered or weaponized it — the bacterium that causes it was living in the wild.

That alone is proof that the conspiracy theory is wrong. But there are plenty of other lines of evidence that show why Lyme disease did not require the human hand changing something Mother Nature had nurtured.

An unlikely bioweapon

I teach a graduate course in biodefense. Biowarfare, the use of biological agents to cause harm, was once an interest of the U.S. military and that of many other countries. One of the most important characteristics of a biowarfare agent is its ability to quickly disable target soldiers. The bacteria that cause Lyme disease are not in this category.

Many of the agents that biowarfare research has focused on are transmitted by ticks, mosquitoes or other arthropods: plague, tularemia, Q fever, Crimean Congo hemorrhagic fever, Eastern equine encephalitis or Russian spring summer encephalitis. In all of them, the early disease is very debilitating, and the fatality rate can be great; 30 percent of Eastern equine encephalitis cases die. Epidemic typhus killed 3 million people during World War I.

Lyme disease does make some people very sick but many have just a flulike illness that their immune system fends off. Untreated cases may subsequently develop arthritis or neurological issues. The disease is rarely lethal. Lyme has a week-long incubation period — too slow for an effective bioweapon.

Even though European physicians had described cases of Lyme disease in the first half of the 20th century, the cause had not been identified. There was no way the military could have manipulated it because they did not know what “it” was. None of us knew — until 1981, when the late Willy Burgdorfer, a medical entomologist, made his serendipitous discovery.

Not proof. In the 1950s, Lyme discoverer Willy Burgdorfer mixed viruses and bacteria in hard and soft ticks as he engineered virulent tick-borne weapons. It’s *possible* that this selective breeding could’ve created a new, more virulent *Borrelia* species. A 2021 analysis article says that the B31 Lyme bacterium strain, *Borrelia burgdorferi* is genetically unusual, with more diverse plasmids than any other bacteria, suggestive of a “mysterious” and “tumultuous” evolution.^{8,9,10, 11,12,13,14}

False. There were two categories of U.S. bioweapons: fast-acting fatal agents and slow-acting incapacitating agents that would weaken a population and its economy. In 1962, the CIA dropped ticks infected with incapacitating agents on Cuban sugar cane workers in Operation Mongoose.^{15,16,17}

Misleading. The military’s selective breeding, viral/bacterial mixing, and irradiation of ticks could’ve created a new *Borrelia* species first “discovered” in the wilds in 1981. Earlier Burgdorfer stuffed ticks with spirochetal bacteria similar to Lyme, including relapsing fever *Borrelia* and leptospira.^{18,19}

Burgdorfer's discovery

Burgdorfer had done his graduate studies in Switzerland in the late 1940s, investigating the biology of tick-borne relapsing fever, a bacterial disease that can spread from animals to people. During the course of that work, he developed new methods to detect infection in ticks and to infect ticks with specific doses of a pathogen. Those methods are still used today by people like me.

Eventually, Burgdorfer moved to the Rocky Mountain Laboratories in Montana, an outpost of the U.S. Public Health Service and National Institutes of Health — at the time, the world center for tick research

Burgdorfer's unique expertise was studying how microbial agents were adapted to the internal tissues of their tick hosts, using experimental infections and microscopy. Until Lyme disease came along, his reputation was as the world's expert on the life cycle of Rocky Mountain spotted fever (RMSF).

It was RMSF that led Burgdorfer to the cause of Lyme disease. He had been working to better understand RMSF on Long Island in New York. Why were dog ticks, the acknowledged vector, uninfected even in areas where people were getting sick? He knew that a new tick, the deer tick, had recently become common on Long Island and been incriminated as a disease vector.

So Burgdorfer asked his colleague Jorge Benach at Stony Brook University for some deer ticks to test for the presence of RMSF bacteria. Benach happened to have some from nearby Shelter Island, N.Y., that he sent along.

In testing the "blood" of the deer ticks, Burgdorfer did not find RMSF bacteria. But he did find spiral-shaped bacteria called spirochetes. The spirochetes were similar to what he had studied as a graduate student: the cause of relapsing fever. If spirochetes caused relapsing fever, perhaps other spirochetes were responsible for the mysterious new Lyme arthritis for which a cause was not known.

This aha moment led to the landmark 1982 paper in Science with a question for a title: "Lyme disease — a tick-borne spirochetosis?"

Half truth. Willy Burgdorfer was also recruited as a biological weapons contractor for his experience working with Q fever, a bioweapons agent, and for his German language skills, useful in interviewing Nazi bioweapons scientists brought to the U.S. in Operation Paperclip. He called them "very nice fellows" and said, "I was doing what the Nazis were doing."^{20,21,22}

Half truth. Burgdorfer also knew that lone star ticks had moved on island, carriers of deadly RMSF rickettsias. He had supplied ticks to D. Sonenshine, an Army-funded researcher who was releasing radioactive ticks on the Atlantic bird flyway in Virginia to track their rate of spread.²³

Misleading. But he did find a novel rickettsia species in the lone star ticks on Long Island and was told to hide this discovery. In 1959, Willy was mixing RMSF rickettsias with Colorado Tick Fever virus inside ticks and he was haunted by the unanswered question: Was this what was really making people sick?^{24,25}

Conspiracy theory vs. facts

Some have overanalyzed that Lyme disease spirochetes were first found in ticks from Shelter Island, so near Plum Island, an isolated facility used as a military research lab until 1954.

But it was just a coincidence that Benach's Shelter Island ticks were the ones in which Burgdorfer made his serendipitous finding. By 1984, once researchers knew what to look for, Lyme disease spirochetes were found in ticks from coastal Connecticut, New Jersey and even California.

But let's pretend the military started working immediately on the newly found agent of Lyme disease in 1981. That's long after Fort Terry on Plum Island was repurposed in 1954 by the Agriculture Department to study exotic animal diseases. It's also after President Richard Nixon outlawed biowarfare research in 1969. If the bacteria was manipulated, it had to have been done after 1981 — so the conspiracy theory's timeline just doesn't work.

The real nail in the coffin for the idea that Lyme disease in the United States was somehow accidentally released from military bioweapons research is that the first American case of Lyme disease turns out not to have been from Old Lyme, Conn., in the early 1970s. In 1969, a physician identified a case in Spooner, Wis., in a patient who had never traveled out of that area. And Lyme disease was found infecting people in 1978 in Northern California.

How could an accidental release take place over three distant locations? It couldn't.

Population genetics research on *Borrelia burgdorferi*, the bacterial agent of Lyme disease, suggest that the northeastern, Midwestern and Californian bacteria are separated by geographical barriers that prevent these populations from mixing. Had there been a lab strain, particularly one engineered to be more transmissible, that escaped within the last 50 years, there would be greater genetic similarity between these three geographic populations. There is no evidence for a recent single source — such as a release from a lab — for Lyme disease spirochetes.

The real reasons for the epidemic becoming so burdensome include reforestation, suburbanization and a failure to manage deer herds.

Misleading. Burgdorfer also discovered the mysterious Swiss Agent rickettsia in 1979 in almost all ticks collected, well before the Lyme bacteria discovery in 1981. Why did they leave this out of their findings?^{26,27}

False. Burgdorfer began selectively breeding and mixing ticks, viruses, and bacteria in 1953. Field testing ran through 1969, and the first human Lyme cases of a new virulent strain were recognized in 1968 (CT) and 1969 (WI).²⁸

False. The military tested bioweapons and *supposedly* harmless simulants that were released by planes, trucks, and boats in multiple, distant locations.²⁹

Misleading. Genomic analysis is ongoing. The virulent B31 Lyme strain is so genetically unique, some biologists want to create a new evolutionary branch for it. Releasing bioweapons documents will help scientists to analyze its evolutionary origins. ^{30, 31}

Partially True. If the military started this, these factors made it worse, along with the secrecy that prevented⁴ an informed response.

Conspiracy thinkers make much of the military's interest in tickborne infections and how it influenced top researchers. Until Lyme disease came along, the number of tick laboratories in the world could be counted on both hands.

As an acknowledged expert on ticks and the infections they transmit, it's surely possible that Burgdorfer received funding from the military, undertook studies for them or was consulted by them. They were one of the few sources of research funds for tick projects in the period from 1950 to 1980. The overarching goal of such applied work would have been understanding the tick-related risks U.S. soldiers faced while deployed, and how to protect them.

That Burgdorfer alluded to biowarfare or biodefense programs in interviews toward the end of his life should not be construed as an admission of participation in top-secret work. I met Burgdorfer several times and was struck by his wry sense of humor. It's my guess that his hints that there was a bigger story to what he did for the military was a prankster's way to toy with the interviewer.

As someone who has worked for more than three decades to understand the epidemiology and ecology of Lyme disease to reduce the risk of Americans getting infected, I am appalled that this conspiracy theory is taken so seriously that Congress is now involved.

The idea that Lyme disease is due to bioweapons research gone wrong is easily disproved. Our legislators could better spend their time fighting for efforts to prevent disease instead of investigating a far-fetched story that's based on misinterpretation and innuendo.

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Undisclosed conflict. Telford did not disclose here or on his [Tufts webpage](#) that he has been director of the \$31M Tufts [New England Regional Biosafety Laboratory](#) since 2016. This is a **significant undisclosed conflict**. The institutions that pay for Telford's salary and lab research don't want the public to know that biological agents have or will escape from a lab. They don't want the people who live nearby to know that his lab works on medical biodefense countermeasures for dangerous biological agents such as anthrax, tularemia, Q fever, and *Rickettsia prowazekii*. This op-ed follows the military disinformation playbook—discredit those asking questions by calling them conspiracy theorists and deflect from the real issues.

False. The top goal was to develop bioweapons that met military objectives. Weapon deployment happened only if protective measures were developed for our soldiers.³²

False. Burgdorfer said he put plague in fleas, yellow fever virus in mosquitoes, and a variety of agents in ticks. He also worked on weaponizing Colorado tick fever for the U.S. biological weapons program. Documents and letters confirm this.^{20,21,22}

Academic intimidation. Designed to discourage serious investigations.

False. There are been no serious scientific investigation into why 3 unusually virulent tick-borne diseases suddenly appeared in the late 60s in two U.S. hot spots. Biological agent releases have long-lasting environmental impacts. Most of the bioweapons documents are still classified, and Congress has the power to inexpensively release these documents to the public. This would save lives and research dollars.

END NOTES

[1] “In 1953 the Biological Warfare Laboratories at Fort Detrick established a program to study the use of arthropods for spreading antipersonnel BW agents. The advantages of arthropods as BW carriers are these: they inject the agent directly into the body, so that a mask is no protection to a soldier, and they will remain alive for some time, keeping an area constantly dangerous.” U.S. Army Chemical Corps, Summary of Major Events and Problems (Fiscal Year 1958), 101. <https://www.osti.gov/opennet/servlets/purl/16006843-5BAfk6/16006843.pdf>, Accessed Sept. 13, 2021.

[2] “...I am a biologist, so that's where I started working on ticks and mosquitoes—how to produce a lot of them. Drop them out of airplanes. Everything was very hush-hush, very secret.” Marlin E. Rice, “James H. Oliver, Jr.: Ticks, Lyme Disease, and a Golden Gloves Champion.” *American Entomologist*, Volume 62, Issue 4, Winter 2016. Pages 206–213, <https://doi.org/10.1093/ae/tmw073>

[3] “On a most discreet (strictly need-to-know) basis, defense is to submit a plan by 2 February on what it can do to put a majority of workers out of action, unable to work in the cane fields and sugar mills, for a significant period for the remainder of this harvest. It is suggested that such planning consider non-lethal BW, insect-borne.” Task 33, Cuba Project, from “Secret Memorandum,” Brigadier General Lansdale, January 19, 1962, President John F. Kennedy Assassination Records Collection, Case no. NW 54214, CoID: 32424914, Released 09–13–2017, National Archives and Records Administration, College Park, MD, <https://www.archives.gov/research/jfk>.

[4] “The strangest thing I did [for the CIA] was to drop ticks on Cuban sugar workers.” Four author interviews with an anonymous CIA covert operative from 2010 to 2018, details on p59-63, Newby, Kris. *Bitten: The Secret History of Lyme Disease and Biological Weapons*. New York, NY: HarperCollins, 2019.

[5] “From 1963 to 1973, SHAD included 52 sets of tests, many involving multiple releases of biological or chemical agents in locations as far-ranging as the Deseret Test Center (80 miles from Dugway), Hawaii, the Panama Canal Zone, and off the coast of San Diego. Besides the 3 microbes cited above (*F. tularensis*, *Coxiella burnetti*, Staphylococcal enterotoxin B), open-air releases included the nerve agents sarin, tabun, soman, and VX. One or more of these potential biological or chemical weapons were used in 26 SHAD tests. Biological simulants were also released: *B. globigii* in 24 tests, *S. marcescens* in 7 tests, and *E. coli* in 5 tests.” Cole LA. “Open-Air Biowarfare Testing and the Evolution of Values.” *Health Secur.* 2016;14(5):315-322. doi:10.1089/hs.2016.0040

[6] Project 112/SHAD Fact Sheets. http://mcm.fhpr.osd.mil/cb_exposures/project112_shad/shadfactSheets.aspx, Sept. 13, 2021.

[7] Alaskan open-air tests of tick-borne tularemia: William C. Patrick III, speech at Washington Roundtable on Science and Public Policy, “The Threat of Biological Warfare,” Feb. 13, 2001,

<https://web.archive.org/web/20080705191456/http://www.marshall.org/pdf/materials/62.pdf>, Accessed Dec. 25, 2018.

[8] W. Burgdorfer et al., "A Technique Employing Embryonated Chicken Eggs for the Infection of Argasid Ticks with *Coxiella burnetii*, *Bacterium tularense*, *Leptospira icterohaemorrhagiae*, and Western Equine Encephalitis Virus," *Journal of Infectious Diseases* 94, no. 1 (1954): 84–89;

[9] W. Burgdorfer et al., "Experimental Studies on Argasid Ticks as Possible Vectors of Tularemia," *Journal of Infectious Diseases* 98, no. 1 (1956): 67–74.

[10] W. Burgdorfer et al., "Development of *Rickettsia prowazekii* in Certain Species of Ixodid Ticks," *Acta Virologica* 12, no. (Jan. 1968): 36–40.

[11] W. Burgdorfer et al., "Experimental Infection of the African Relapsing Fever Tick, *Ornithodoros moubata* (Murray), with *Borrelia latychevi* (Sofiev)," *Journal of Parasitology* 40, no. 4 (1954): 456–60.

[12] W. Burgdorfer et al., "The Possible Role of Ticks as Vectors of Leptospirae: I. Transmission of *Leptospira pomona* by the Argasid Tick, *Ornithodoros turicata*, and the Persistence of This Organism in Its Tissues," *Experimental Parasitology* 5, no. 6 (Nov. 1956): 571–79.

[13] J. Bell, W. Burgdorfer, and G. Moore, "The Behavior of Rabies Virus in Ticks," *Journal of Infectious Diseases* 100, no. 3 (1957), 278–83.

[14] Schwartz I, Margos G, Casjens SR, Qiu WG, Eggers CH. Multipartite Genome of Lyme Disease *Borrelia*: Structure, Variation and Prophages. *Curr Issues Mol Biol.* 2021;42:409-454. doi:10.21775/cimb.042.409

[15] "On the Link Between Lyme Disease and Bioweapons: Kris Newby Explores the Murky History of Government Experiments with Bug-Borne Illness." <https://lithub.com/on-the-link-between-lyme-disease-and-bioweapons/>, accessed Sept. 14, 2021.

[16] "Incapacitating agent," https://en.wikipedia.org/wiki/Incapacitating_agent

[17] "The strangest thing I did [for the CIA] was to drop ticks on Cuban sugar workers." Four author interviews from 2010 to 2018 with an anonymous CIA covert operative, details pages 59-63, Newby, Kris. *Bitten: The Secret History of Lyme Disease and Biological Weapons*. New York, NY. HarperCollins, 2019. Page view: <https://static1.squarespace.com/static/5d3e44b9c794f00001fd56e9/t/5d9f5885324ed053efc8ac71/1570723974137/Plan-for-Dropping-Incapacitating-Weaponized.pdf>

[18] *bid.* *Bitten* p259-260. <https://static1.squarespace.com/static/5d3e44b9c794f00001fd56e9/t/5d9f57919e9c5e292b969da3/1570723729754/Radioactive-Ticks-Release-in-Army-Funded-Studies.pdf>, accessed Sept. 14, 2021.

[19] "On the Link Between Lyme Disease and Bioweapons: Kris Newby Explores the Murky History of Government Experiments with Bug-Borne Illness." <https://lithub.com/on-the-link-between-lyme-disease-and-bioweapons/>, accessed Sept. 14, 2021.

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- [22] "I was doing what the Nazis were doing." Videotaped interview Willy Burgdorfer by Kris Newby. Dec. 2013.
- [23] "I want to attempt to rear a release population of radioactive rabbit ticks for field trials here this summer. " <https://www.documentcloud.org/documents/21063469-19670510-willy-sends-sonenshine-ticks>, <https://academic.oup.com/jme/article-abstract/5/2/229/2221854>
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