



Bitten

The Secret History of Lyme Disease and Biological Weapons

Kris Newby

Book Summary: Lies are Unbekoming

Contents

Chapter 1 - Bitten	3
Chapter 2 – The Scientist	4
Chapter 3: Coin Toss.....	5
Chapter 4: Bitterroot Bride	6
Chapter 5: Big Itch.....	7
Chapter 6: Fever.....	8
Chapter 7: Special Operations.....	9
Chapter 8: Behind the Curtain	10
Chapter 9 - "Out of the Abyss"	11
Chapter 10 - "Confession"	12
Chapter 11 - "Missing Files"	13
Chapter 12 - "Last Interview"	14
Chapter 13 - "Rebellion"	15
Chapter 14 - "Smoking Gun"	16
Chapter 15-17: "Eight Ball," "Speed Chess," and "Fear"	17
Chapter 18: "Fog of War"	19
Chapter 19: "Lone Star"	20
Chapter 20: "Survival"	21
Chapter 21: "Castleman's Case"	22
Chapter 22: "Red Velvet Mites"	23
Chapter 23: "Wildfire".....	24
Chapter 24: "Swiss Agent"	25
Chapter 25: Collateral Damage	26
Chapter 26: Discovery	27
Chapter 27: DNA Detectives.....	28
Chapter 28: Change Agent	29
Chapter 29: Sins of our Fathers.....	30
Chapter 30: Surrender	31
Epilogue: Palo Alto, California, 2018	32
Appendix I: Ticks and Human Disease Agents	33
Appendix II: Uncontrolled Tick Releases, 1966–19691	35

Chapter 1 - Bitten

This chapter chronicles the initial experiences of the author, Kris Newby, and her husband Paul, when they were bitten by ticks on a vacation to Martha's Vineyard in 2002. At the time, the couple was blissfully unaware of the life-changing implications of these tick bites. Little did they know that these ticks carried disease-causing organisms that would significantly impact their health. The author vividly describes the complex and subtle feeding process of the tick and how its salivary chemicals suppressed their immune defenses, allowing the harmful organisms to multiply unchallenged. The chapter ends with the author sharing her theory that these disease-carrying ticks might be remnants of biological weapons used during the Cold War.

Key Takeaways:

- Ticks are adept parasites, able to wait patiently and sense the approach of a warm-blooded animal.
- The author, Kris Newby, and her husband Paul were bitten by ticks during their vacation at Martha's Vineyard, unaware of the severe health implications.
- Ticks attach to their host's skin and introduce their feeding apparatus into the blood supply.
- The tick's salivary glands release chemicals that suppress the host's immune defenses, allowing disease-causing organisms to proliferate.
- The symptoms associated with tick-borne diseases are complex and often unrecognized or misinterpreted in medical literature.
- The author suspects that the increasing epidemic of tick-borne diseases might be linked to the use of biological weapons during the Cold War.
- Disease-causing microbes released decades ago may still persist in the environment, carried by ticks and other vectors, affecting birds, animals, and humans alike.
- The ramifications of this potential bio-weapons disaster might be felt for decades, likened by the author to an "American Chernobyl."

Quotes:

- "Paul and I had been bitten by unseen ticks harboring an unknown number of disease-causing organisms. These tick bites would rob us of our good health..."
- "While the use of arthropod-borne biological weapons ended decades ago—the disease-causing microbes the bugs carried are still lurking... It is an American Chernobyl."

Chapter 2 – The Scientist

This chapter highlights the pioneering work of Swiss American scientist Willy Burgdorfer. Willy is noted for his groundbreaking discovery of the causative organism of Lyme disease: a spirochete bacteria named after him as *Borrelia burgdorferi*. This chapter also introduces a more controversial claim made by Burgdorfer near the end of his life, where he postulated that the rapid spread of Lyme disease might have originated from a biological weapons release, thereby highlighting the complexity of diagnosing and treating the disease.

Key Takeaways:

1. Wilhelm "Willy" Burgdorfer is a notable figure in biomedical science, known for his contribution to understanding Lyme disease.
2. In his research, Burgdorfer discovered the spirochete bacteria (*Borrelia burgdorferi*) in the midgut of ticks which he attributed to the cause of Lyme disease.
3. The discovery led to a scientific breakthrough in understanding the cause of Lyme disease, leading to increased global interest and further research into the disease.
4. Burgdorfer's finding was meticulously validated through comprehensive lab experiments, contributing to its recognition and acceptance in the scientific community.
5. His groundbreaking work earned him multiple awards and recognition from esteemed institutions around the world.
6. The success of Burgdorfer's discovery was credited to his relentless work ethic, extensive knowledge, and remarkable observational skills.
7. Burgdorfer was aware of previous studies suggesting a link between ticks, spirochete bacteria, and diseases with similar symptoms to Lyme disease, which guided his research.
8. Near his death, Burgdorfer made a controversial claim that the spread of Lyme disease might be tied to a biological weapons release, making diagnosis and treatment challenging.

Quotes:

1. "This was Willy's 'aha' moment."
2. "While all the pieces of this public-facing story are true, they don't represent the *whole* truth. Shortly before his death, Willy was videotaped saying that he believed that the outbreak of tick-borne diseases that started around Lyme, Connecticut, had been caused by a bioweapons release.⁹ It was a stunning admission, but it could explain why the condition we call Lyme disease is so hard to diagnose and treat—and why the epidemic is spreading so far and so fast."

Chapter 3: Coin Toss

Chapter 3 delves into the early life of Willy Burgdorfer, a Swiss scientist, and his journey into the world of tick research. The chapter begins in 1948 when Professor Rudolf Geigy shows Willy an ordinary petri dish filled with sand, containing eyeless tampan ticks. Geigy explains their behavior and how they transmit potentially deadly diseases. This marks the beginning of Willy's fascination with ticks and sets the stage for his future work in tick-borne diseases.

Key takeaways from Chapter 3:

1. Willy Burgdorfer's love affair with ticks began in 1948 when he was shown eyeless tampan ticks by Professor Rudolf Geigy.
2. The ticks bury themselves under dirt floors, waiting for a blood meal and transmitting diseases in the process.
3. Geigy airmailed Willy ticks from Africa for study, initiating their collaboration.
4. Willy's upbringing in a working-class family and his father's aspirations for his sons shaped his journey.
5. Despite initial academic challenges, Willy's father encouraged him to strive for success in education.
6. Willy's entrance into the University of Basel and his subsequent doctoral program set the stage for his career in tick research.
7. Geigy's adventures and dedication to minimizing tropical diseases inspired Willy to join his institute.
8. Willy's early research focused on ticks and the spirochetal bacterium *Borrelia duttoni*, which causes African relapsing fever.

Quote:

"This was the beginning of Willy's love affair with ticks."

Chapter 4: Bitterroot Bride

Chapter 4 explores Willy Burgdorfer's move to Hamilton, Montana in 1951 and his work at the Rocky Mountain Laboratory. Willy is introduced to Gordon Davis, his sponsor for the coming year, and learns about his role in studying tick-borne diseases. The chapter also highlights Willy's growing relationship with Gertrude Dale See, who becomes his wife. The couple forms a deep bond and shares experiences in the scenic Bitterroot Valley.

Key takeaways from Chapter 4:

1. Willy's arrival in Hamilton, Montana, in 1951 and his admiration for the picturesque surroundings.
2. The Rocky Mountain Laboratory's role in researching bug-borne diseases and vaccines.
3. Willy's fellowship year spent learning new skills and assisting in tick-borne disease research.
4. The method of mass-producing ticks and *Rickettsia rickettsii* organisms for vaccine production.
5. Willy's introduction to Dale See, who becomes his interpreter, tour guide, and eventually his wife.
6. The couple's adventurous picnic and shooting competition in Lost Horse Canyon.
7. Willy's proposal to Dale, her initial refusal, and eventual acceptance of his marriage proposal.
8. Their wedding ceremony in September 1952 and their subsequent life together in Hamilton, Montana.

Quote:

"The Bitterroot Valley, dear Professor, is a wonderful place in the summertime, and often I wish I could spend a few days together with you, not only in discussing scientific problems but also in hiking or doing field work in one of the nice canyons all around Hamilton."

Chapter 5: Big Itch

Chapter 5 of "The Biography of a Deadly Germ" explores the use of arthropods as carriers of anti-personnel biological weapons during the Cold War. The chapter highlights the Suffield Experimental Station in Canada, where field tests were conducted on chemical and bioweapons bombs. The chapter also provides insights into the U.S. Army Chemical Corps' extensive chemical and biological weapons program, which included animal research, field testing, and the production of biological agents. Willy Burgdorfer, a young scientist, becomes a part of this program and learns about the transformation of arthropods into lethal weapons.

Key Takeaways:

1. The Suffield Experimental Station in Canada was involved in field tests on chemical and bioweapons bombs, including nerve gas tests and the development of deadly biological agents.
2. Arthropods, such as ticks, fleas, and mosquitoes, were explored as carriers for spreading anti-personnel biological weapons due to their ability to inject agents directly into the body.
3. The U.S. Army Chemical Corps managed the extensive chemical and biological weapons program, which included various research facilities across the country and collaboration with the Central Intelligence Agency (CIA).
4. Young scientists, like Willy Burgdorfer, were recruited for the program and worked on projects involving the mass production and infection of arthropods with disease-causing agents.
5. The program aimed to find arthropod species that wouldn't arouse suspicion and develop bioweapons to which the enemy population wouldn't have natural immunity.
6. Willy Burgdorfer's work involved force-feeding ticks and other arthropods with disease agents, exploring the compatibility between microbes and tick species, and fulfilling special tick requests for research purposes.
7. Field trials, such as Operation Big Itch, involved dropping uninfected fleas from airplanes to evaluate coverage patterns and survival rates for potential bioweapon deployment.
8. The chapter sheds light on the ethical dilemmas faced by scientists like Willy Burgdorfer as they grappled with the consequences of their work and the potential harm caused by the development of lethal bioweapons.

Quotes:

1. "He was no longer protecting humans from tiny eight-legged beasts. He was instead turning those beasts into lethal weapons."
2. "The program aimed to find a tick that wouldn't arouse the suspicion of an enemy country, filled with an agent for which the target enemy population wouldn't have natural immunity."

Chapter 6: Fever

Chapter 6 of "The Biography of a Deadly Germ" delves into Operation Mongoose, a covert program aimed at destabilizing the Cuban government led by Fidel Castro. The chapter focuses on a specific mission involving the use of ticks as a potential weapon against Cuba. A Texan operative, recruited by the CIA, participates in a night flight over the Caribbean, dropping boxes filled with ticks onto Cuban soil. The chapter also explores the personal consequences faced by the operative, including his son falling ill with a mysterious disease, and the connections he draws between his mission and his son's illness.

Key Takeaways:

1. Operation Mongoose was a highly secretive program initiated by the U.S. government to undermine the Cuban government and remove Fidel Castro from power.
2. The chapter sheds light on one mission within Operation Mongoose where ticks were dropped over Cuba as a potential means of incapacitating sugar workers.
3. The Texan operative, part of the mission, is taken by surprise when he opens the boxes and discovers them filled with thousands of ticks.
4. Following the mission, the operative's son falls ill with a severe fever and is eventually diagnosed with a mysterious brain disease. The doctors struggle to identify the cause.
5. A young resident with experience in tropical medicine recognizes the disease and treats the operative's son successfully.
6. The operative suspects a connection between the ticks he dropped over Cuba and his son's illness, leading him to inquire with his CIA commander, who advises him to burn all the clothes he took to Cuba.
7. Operation Mongoose involved numerous other plots and devices to weaken the Cuban economy and eliminate Fidel Castro, including poisoned cigars, booby-trapped objects, and bacterially infected scuba suits.
8. The chapter highlights the secretive nature of Operation Mongoose and the risks involved, both in terms of the intended targets and the unintended consequences for those involved.

Quotes:

1. "The disease was bug-borne and had a long, hard-to-remember name. The baby recovered fully."
2. "The Texan asked his CIA operations commander if the illness could be related to his Cuban mission. The commander replied, 'I can't give you any details, but you really need to burn all the clothes you took to Cuba. Burn everything.'"

Chapter 7: Special Operations

In Chapter 7, "Willy Burgdorfer embarks on his Guggenheim fellowship at the London School of Hygiene and Tropical Medicine. He faces the challenge of transitioning from his expertise in mass-producing disease agents to learning electron microscopy and working with bacteria and viruses. Under the mentorship of Professor Douglas Bertram, Willy explores the art and science of electron microscopy and techniques for studying small rickettsia bacteria and viruses. The chapter also delves into the advancements in microbial genetics and the potential for manipulating viruses and bacteria to create powerful bioweapons.

Key Takeaways:

1. Willy Burgdorfer begins his Guggenheim fellowship at the London School of Hygiene and Tropical Medicine.
2. He learns about electron microscopy and techniques for working with small rickettsia bacteria and viruses.
3. Professor Douglas Bertram becomes Willy's mentor and teaches him the intricacies of imaging viruses using a transmission electron microscope.
4. Willy faces the challenge of transitioning from his role as a military expert in mass-producing disease agents to learning new skills in electron microscopy.
5. The chapter explores Willy's personal struggles, including missing his family and contemplating his career choices.
6. Advances in microbial genetics are discussed, highlighting the potential for manipulating viruses and bacteria to create more powerful bioweapons.
7. The concept of an ideal incapacitating agent is introduced, which involves causing moderate illness in a large population without their awareness.
8. Willy's research involves growing microbes inside ticks and combining bacteria and viruses to accelerate mutations and create desirable traits.

Chapter 8: Behind the Curtain

Chapter 8 follows Willy Burgdorfer as he travels to Bratislava, Czechoslovakia, to collaborate with Josef Řeháček at the Institute of Virology. Willy aims to learn Řeháček's method of mass-producing rickettsias and viruses in live tick-tissue cells. The chapter explores the competitive nature of scientific research and the race-like atmosphere between Willy and Řeháček. Willy faces personal struggles being away from his family and the challenges of adapting to a different research environment.

Key Takeaways:

1. Willy Burgdorfer travels to Bratislava, Czechoslovakia, to collaborate with Josef Řeháček at the Institute of Virology.
2. He aims to learn Řeháček's method of mass-producing rickettsias and viruses in live tick-tissue cells.
3. The chapter highlights the similarities between Řeháček's work and the program at Rocky Mountain Lab, emphasizing a sense of competition and a race-like atmosphere.
4. Willy faces challenges in adapting to a new research environment and learning Řeháček's techniques.
5. The chapter explores Willy's social experiences in Bratislava, including attending cultural events and socializing with researchers.
6. Řeháček hopes to secure a research fellowship at Rocky Mountain Lab through his collaboration with Willy.
7. Willy's letters to his family reveal his longing to return home and his concerns about his wife's well-being.
8. Despite the social engagements, Willy grapples with personal struggles and a growing desire to be reunited with his family.

Chapter 9 - "Out of the Abyss"

Chapter 9 of the book recounts the author's harrowing journey of seeking a diagnosis for a mysterious illness that plagued her and her husband. Despite experiencing debilitating symptoms such as fatigue, neurological impairments, and gastrointestinal issues, they struggled to find answers within the medical system. Numerous doctors dismissed their concerns, and the unreliable tests for Lyme disease further complicated the diagnosis. The chapter highlights the limitations of the medical system in recognizing and treating tick-borne diseases, the significant impact on the author's life, and the search for a knowledgeable physician who ultimately provided a proper diagnosis.

Key Takeaways:

1. The author and her husband fell ill with a severe, flu-like illness after a family picnic, experiencing symptoms such as fatigue, muscle pain, and neurological impairments.
2. Despite suspecting Lyme disease, initial doctors dismissed their concerns and attributed their symptoms to a viral infection.
3. The medical system's reliance on unreliable Lyme disease tests and lack of knowledge about tick-borne diseases led to misdiagnoses and delayed treatment.
4. The author's condition worsened over time, leading to cognitive dysfunction, severe fatigue, and financial struggles due to medical expenses and loss of income.
5. After enduring multiple doctors' dismissals, they sought out a Lyme-literate physician who diagnosed them with tick-borne infections, including Lyme disease and babesiosis.
6. The author's experiences reflect the challenges faced by many Lyme disease patients in obtaining a proper diagnosis and treatment within the current medical system.
7. The lack of funding and limited research on tick-borne diseases contribute to the ongoing difficulties in diagnosing and managing these conditions.
8. The author's journey inspired her to collaborate on a documentary, "Under Our Skin," which shed light on Lyme disease and increased awareness about the struggles faced by patients.

Quote:

"The politics of the disease were too charged, and the government researchers seemed to want to steer clear of the controversy... 'The controversy in Lyme disease research is a shameful affair. And I say that because the whole thing is politically tainted. Money goes to people who have, for the past thirty years, produced the same thing: nothing. Serology [blood analysis] has to be started from scratch with people [meaning scientists] who don't know beforehand the results of their research.'"

Chapter 10 - "Confession"

In Chapter 10 the author receives a DVD containing a shocking interview with Willy Burgdorfer, a renowned scientist known for his research on Lyme disease. The interview, conducted by filmmaker Tim Grey, reveals hidden aspects of Willy's scientific work and suggests a potential cover-up regarding the origins and nature of Lyme disease. The chapter delves into the interview, exploring Willy's admissions and the implications they hold for the understanding of Lyme disease's complexities.

Key Takeaways:

1. The author watches a video interview with Willy Burgdorfer, a prominent scientist known for his work on Lyme disease.
2. Filmmaker Tim Grey conducts the interview to uncover hidden information about Willy's scientific career, including his involvement in tick infection experiments for the U.S. bioweapons program.
3. Willy admits to intentionally infecting ticks with disease agents and discusses the potential of *Borrelia burgdorferi* (the Lyme disease pathogen) for biological warfare.
4. Grey presses Willy about his responsibility for the emergence of Lyme disease and potential cover-ups surrounding its origins.
5. Willy's admission suggests that Lyme disease might not be a naturally occurring germ but rather a creation of a military bioweapons lab.
6. The interview opens the door to a possible explanation for the complexities of Lyme disease that had eluded researchers and activists for decades.
7. The chapter highlights the emotional toll on Willy, who had carried this truth within him for over thirty years.
8. The author contemplates her role in uncovering the truth about Lyme disease and feels a sense of guilt for the documentary's previous shortcomings.

Quote:

"It had been created in a military bioweapons lab for the specific purpose of harming human beings. And somehow it had gotten out."

Chapter 11 - "Missing Files"

Chapter 11 of the book "Missing Files" takes place at the National Archives in College Park, Maryland. The author and filmmaker Tim Grey embark on a search for evidence within the recently released "Willy Burgdorfer Papers" that could support Willy's admission about Lyme disease being a biological weapon. Facing strict security protocols, they navigate the archives to uncover missing documents, suspiciously erased folder tabs, and intriguing film negatives labeled "The Swiss Agent." As they delve deeper, they realize that crucial materials related to Willy's 1981 Lyme disease discovery are conspicuously absent.

Key Takeaways:

1. The author and Tim Grey visit the National Archives to find evidence supporting Willy's claim about Lyme disease being a biological weapon.
2. Strict security measures require visitors to adhere to rules regarding personal items and access to archival documents.
3. The "Willy Burgdorfer Papers" consist of 33 boxes containing thousands of pages of documents, lab notebooks, and images.
4. Pamela Weintraub, an expert on Lyme disease, and Tim Grey join the author in the search for evidence.
5. Missing slides related to Lyme disease experiments raise suspicions about tampering or removal of documents.
6. The absence of a folder for Allen Steere, a co-discoverer of Lyme disease, suggests the possibility of deliberate removal or substitution.
7. Film negatives labeled "The Swiss Agent" become a curious find, hinting at a mysterious connection to Lyme disease.
8. Despite searching extensively, the most crucial materials associated with Willy's 1981 Lyme disease discovery remain missing, leaving unanswered questions.

Quote: "It's from The Lorax, that Dr. Seuss book. 'Unless someone like you cares a whole awful lot, / Nothing is going to get better. It's not.'" - Tim Grey, referencing a tattoo on his arm, while discussing the importance of uncovering the truth.

Chapter 12 - "Last Interview"

In Chapter 12 of the book the author conducts a crucial interview with Willy Burgdorfer, who is suffering from advanced Parkinson's disease. The interview takes place in a cold conference room, and the author aims to extract answers about the missing Lyme disease discovery files and the mysterious "Swiss Agent" microbe found in the National Archives. Despite Willy's declining health, the author asks specific questions about ticks, patient blood samples, and Willy's research involving ticks and bioweapons at NAMRU-3 in Cairo, Egypt. Willy's garbled answers and reluctance to provide full disclosure raise suspicions about the potential involvement of the Russian government. The interview ends abruptly due to Willy's deteriorating health.

Key Takeaways:

1. The author conducts a final interview with Willy Burgdorfer in an attempt to uncover the truth about Lyme disease's connection to bioweapons.
2. Willy's Parkinson's disease makes communication challenging, but the author persists in questioning him about the missing Lyme discovery files and the "Swiss Agent" microbe.
3. Willy reveals that he tested ticks from Shelter Island, and a non-disease-causing rickettsial species similar to *Rickettsia montanensis* was found in most ticks.
4. Willy suggests that certain individuals may have been paid off to stop investigating the mystery rickettsia.
5. The author presents Willy with an image of the "Swiss Agent" microbe, and Willy confirms it as a *Rickettsia montana*-like organism that does not cause disease in humans.
6. Willy's answers about his involvement in tick-related research at NAMRU-3 in Cairo hint at potentially sinister activities related to bioweapons, including infecting fleas with plague.
7. The author learns that the goal of some tests was to create infections that wouldn't show physical symptoms and could evade standard screening tests.
8. Willy's deteriorating health interrupts the interview, leaving unanswered questions and suspicions regarding his involvement in bioweapon experiments and the true nature of the "Swiss Agent" microbe.

Quote: "The virus lowers the antigen, so you can't test for it?" - The author, seeking confirmation from Willy Burgdorfer about the manipulations of microbes to create infections that would evade detection.

Chapter 13 - "Rebellion"

In Chapter 13 of the book the author provides an account of the Lyme disease controversy and the ongoing battle between different stakeholders. The chapter begins with a vivid description of protestors outside the Infectious Diseases Society of America (IDSA) annual meeting, demanding a revision of the Lyme disease guidelines. The author highlights the contentious issue of chronic Lyme disease, which is not classified as an ongoing infection in the IDSA guidelines. The guidelines have been used by medical insurers to deny treatment, and conflicts of interest among the authors have been exposed. The author discusses the delayed release of Freedom of Information Act (FOIA) documents that reveal the influence of commercial interests on Lyme disease research and policy. The chapter also showcases moments where the medical community itself questions the existing guidelines and calls for more research on treatments.

Key Takeaways:

1. Protestors demand a revision of the IDSA Lyme disease guidelines outside the annual meeting, highlighting the division between academic researchers and chronic Lyme disease patients.
2. The IDSA guidelines do not classify chronic Lyme disease as an ongoing infection, leading to denial of treatment and potential loss of medical licenses for physicians who deviate from the guidelines.
3. The IDSA guidelines were subject to an antitrust settlement, which required a re-review of the guidelines. However, the selected review panel deemed no changes necessary, raising concerns about bias.
4. FOIA documents obtained after a prolonged delay reveal conflicts of interest and hidden agendas among government officials, guidelines authors, and researchers related to Lyme disease.
5. A covert "disinformation war" and a "socio-political offensive" were conducted to discredit Lyme patients, physicians, and journalists who questioned the guidelines.
6. The delayed release of FOIA documents exposed financial interests and patent holdings among the authors of the IDSA guidelines, raising questions about their motives.
7. Questions raised within the medical community challenge the easy-to-treat and easy-to-cure approach advocated by the IDSA guidelines, indicating a need for further research on treatments.
8. The possibility of additional pathogens causing chronic Lyme symptoms, including potential bioweapons, adds another layer of complexity to the controversy.

Quote: "The stark contrast between the Infectious Diseases Society dark suits and the protestors' lime-green created the perfect visual metaphor for the Lyme Wars." - Depicts the visual representation of the opposing sides in the Lyme disease controversy, symbolizing the divide between academic researchers and chronic Lyme disease patients.

Chapter 14 - "Smoking Gun"

This chapter delves into the author's visit to Orem, Utah, where he reviews Willy Burgdorfer's personal research documents related to Lyme disease. Willy had enlisted the help of Ron Lindorf, an entrepreneur and father of a Lyme patient, to preserve his research papers. The chapter reveals the contents of Willy's garage-turned-archive, including articles, reference books, lab notes, and even files on bioweapons experiments. The author uncovers the presence of a mysterious rickettsia called "Swiss Agent USA" in patient blood tests from the original Lyme outbreak, contradicting what had been published. The discovery of this "smoking gun" raises further questions about the origins and nature of Lyme disease.

Key Takeaways:

1. The author travels to Orem, Utah, to examine Willy Burgdorfer's personal research documents on Lyme disease.
2. Ron Lindorf, a Lyme patient's father and archivist, helps preserve and organize the documents in Willy's garage-turned-archive.
3. The archive contains various materials, including research papers, lab notes, slides, and reports on bioweapons experiments.
4. Among the documents, the author finds a folder labeled "Detrick 1954–56" containing letters and reports on Willy's work infecting fleas, mosquitoes, and ticks with lethal agents.
5. The presence of deposit slips from Swiss bank accounts hints at possible financial implications or connections.
6. The "smoking gun" discovery lies in Willy's handwritten lab notes, which reveal the presence of "Swiss Agent USA," a mysterious rickettsia, in patient blood tests from the original Lyme outbreak.
7. The discovery contradicts the published belief that a spirochete was the sole cause of Lyme disease.
8. The chapter ends with a surreal encounter with an armed SWAT team searching for a fugitive, adding to the author's sense of a surreal and intense journey.

Quote:

"It didn't take a PhD in microbiology to see that almost all the patient blood had reacted strongly to an antigen test for a European rickettsia that Willy had called the Swiss Agent." - Illustrates the significant finding of the presence of "Swiss Agent USA" in patient blood tests, challenging previous understandings of the cause of Lyme disease.

Chapter 15-17: "Eight Ball," "Speed Chess," and "Fear"

In Chapter 15 of the book, "Eight Ball," the author visits Fort Detrick, the original headquarters of the U.S. offensive biological weapons program, to investigate the possibility of open-air testing of tick-borne microbes. With the help of a military scientist guide named "Number Six," the author learns about the history of Fort Detrick and Operation Whitecoat, where volunteers participated in medical experiments related to biological agents.

In Chapter 16, "Speed Chess," the author meets with Joel McCleary, a biosecurity expert, to discuss the threat of biological warfare and the insights shared by William Patrick III, a former chief architect of Fort Detrick's bioweapons program. The chapter delves into the discussion of deployable incapacitating biological weapons and the potential involvement of the Russians in bioweapon activities.

Chapter 17, "Fear," explores William Patrick III's public talk on the threat of biological warfare and the vulnerability tests conducted by the military. The chapter raises questions about the timing of the anthrax mailings and the potential correlation to Patrick's fear-inducing talk.

Chapter 15: "Eight Ball"

1. Fort Detrick, located in Maryland, served as the original headquarters for the U.S. offensive biological weapons program.
2. The "Eight Ball," a one-million-liter test sphere, was used to study infectivity rates of aerosolized biological agents on animals and humans.
3. Operation Whitecoat involved Seventh-day Adventist volunteers who participated in medical experiments instead of combat duty.
4. The history and purpose of the Eight Ball and its role in testing biological agents for military purposes are discussed.
5. The author explores the possibility of open-air testing of tick-borne microbes near Lyme, Connecticut, based on documents obtained from Willy's garage.
6. The author is accompanied by a guide known as "Number Six," who provides insights into Fort Detrick's history and the experiments conducted there.
7. The connection between Fort Detrick and Willy's research on tick-borne diseases is explored, highlighting the potential military involvement.
8. The chapter raises questions about the potential link between military activities at Fort Detrick and the origins of Lyme disease.

Chapter 16: "Speed Chess"

1. The author meets with Joel McCleary, a biosecurity expert and former White House aide, to discuss the threat of biological warfare.
2. William Patrick III, a key figure in Fort Detrick's bioweapons program, shares information about deployable incapacitating biological weapons.
3. The concept of incapacitating biological weapons involving toxin, virus, and bacterium combinations is explored.
4. The potential involvement of the Russians in bioweapons activities is discussed, with implications for the spread of Lyme disease.
5. The author and McCleary engage in a rapid-fire exchange of knowledge, akin to a game of speed chess, discussing technical aspects of bioweapons research.

6. The chapter mentions the possibility of open-air tests for tularemia in the South Pacific and Alaska, with classified documents potentially containing relevant information.
7. The discovery of Swiss bank account receipts in Willy's garage raises further intrigue and suggests financial implications related to bioweapons research.
8. McCleary emphasizes the dangerous nature of the author's theories and warns about potential consequences if they are proven true.

Chapter 17: "Fear"

1. William Patrick III's public talk on the threat of biological warfare and vulnerability tests is discussed.
2. Patrick showcases simulants of anthrax and Venezuelan equine encephalitis, highlighting the ease with which he could transport them without arousing suspicion.
3. The chapter mentions vulnerability tests conducted on the public, such as Operation Sea-Spray, which involved spraying *Bacillus subtilis* off the coast of San Francisco.
4. The potential correlation between Patrick's fear-inducing talk and the subsequent anthrax mailings after the 9/11 terrorist attacks is raised.
5. The susceptibility of the public to bioweapon attacks, as demonstrated by vulnerability tests, is highlighted.
6. The chapter mentions the aerial dissemination of simulant particles during an attack on Eglin Air Force Base and naval tests off the coast of Alaska.
7. Patrick's presentation raises questions about the government's preparedness and security measures in response to bioweapon threats.
8. The chapter alludes to the potential consequences of discussing Russian or Soviet involvement in unleashing bioweapons upon the United States, with immense international repercussions and personal danger for those making such claims.

Chapter 18: "Fog of War"

This chapter delves into the covert bioweapon tests conducted by the CIA, U.S. Army, and Department of Defense in the 1960s and '70s. It focuses on an open-air experiment conducted in the New York City subway system, revealing the vulnerability of a large population to a bioweapon attack. The chapter also discusses the implications of these tests and their connection to the termination of the U.S. offensive biological weapons program.

- The CIA, U.S. Army, and Department of Defense conducted open-air tests of biological and chemical warfare agents in various locations, including the New York City subway system.
- The experiment in the subway involved the release of invisible, odorless bacteria particles that mimicked weaponized anthrax, revealing the potential vulnerability of a large population.
- The tests were part of larger programs, such as Project Shipboard Hazard and Defense (SHAD), which sprayed simulated and live agents over oceans and coastal areas.
- Some of these experiments were revealed through investigations and lawsuits, but others remain classified or poorly documented.
- Scientists and researchers at universities were involved in defense research contracts, but some began questioning their institutions' involvement in chemical and biological weapons research.
- Joshua Lederberg, a Nobel Prize recipient, advocated for a treaty to ban biological weapons due to the potential global threat they posed.
- The army's Biological Subcommittee Munitions Advisory Group downplayed scientists' concerns and continued discussing plans for genetic manipulation and the development of lethal agents.
- The chapter highlights the risks and consequences associated with bioweapon testing and the political climate surrounding the issue.

Chapter 19: "Lone Star"

This chapter explores the behavior and spread of lone star ticks (*Amblyomma americanum*) and their connection to diseases such as Rocky Mountain spotted fever, tularemia, and ehrlichiosis. The chapter discusses the research conducted on tick populations and the concerns surrounding their expansion into new areas.

- Daniel Sonenshine, a parasitologist, conducted studies on lone star ticks and their behavior in different regions, including Virginia and Montana.
- Sonenshine used radioisotope tagging to track the feeding and migration patterns of ticks, including their interaction with wild animals.
- The lone star tick is known for its aggressive biting behavior and its ability to transmit several serious human diseases.
- The tick's range has been expanding northward, and established populations have been observed as far north as Maine.
- The reasons for the tick's migration and expansion are complex and may be influenced by factors such as climate change, deer populations, human movement, and potential human interventions.
- The chapter raises questions about the environmental impact of tick studies and the need for careful approval processes in modern research.
- The resilience of lone star ticks and their ability to survive in various conditions, such as freezing temperatures and different water types, is highlighted.
- The potential health risks associated with lone star ticks and the need for further understanding of their behavior and spread are emphasized.

Chapter 20: "Survival"

This chapter reflects on the author's childhood experiences in nature and introduces the concept of survival and resilience in insects and arachnids. It sets the stage for understanding the evolutionary adaptability of ticks, including their ability to spread and survive in changing environments.

- The author recalls childhood experiences exploring nature, particularly focusing on encounters with insects and arachnids.
- The story of a praying mantis egg case and the survival of a single mantis among its siblings teaches a lesson about Darwinian survival and the tenacity of insects.
- The chapter foreshadows the arrival of lone star ticks in the author's childhood area and the subsequent impact on tick-borne diseases.
- The resilience and survival skills of insects and arachnids are contrasted with the potential vulnerability of humans to the diseases they carry.
- The chapter highlights the need for understanding the adaptability and behavior of ticks, particularly in the context of their expanding range and potential health risks.
- The quote by E. O. Wilson emphasizes the ecological significance of insects and the potential consequences of their disappearance.
- The author's personal experiences serve as a backdrop for the broader exploration of tick survival and the interconnectedness of species in ecosystems.
- The chapter sets the stage for further discussion on the impact of ticks and tick-borne diseases on human populations.

Chapter 21: "Castleman's Case"

This chapter focuses on a medical case presented by Dr. Benjamin Castleman in 1973 that baffled Harvard physicians-in-training. The case involved an 11-year-old girl with a mysterious illness characterized by fever, rash, weight loss, and other symptoms. The chapter explores the diagnostic process, the identification of rickettsial bacteria as the cause, and the implications of the case for the understanding of tick-borne diseases.

- Dr. Benjamin Castleman presented a perplexing case of an 11-year-old girl with a high fever, rash, and other symptoms to Harvard physicians-in-training.
- The girl's illness was characterized by anorexia, weight loss, and daily fever spikes, which led to her hospitalization.
- The diagnostic process involved the expertise of dermatologists, pathologists, and other specialists who analyzed blood tests and skin biopsy samples.
- The presence of rickettsial bacteria in the girl's blood vessels and the resulting damage to her organs were key findings in the case.
- The case highlighted the challenge of diagnosing and understanding tick-borne diseases, particularly Rocky Mountain spotted fever.
- The use of microscopy and specialized tests aided in identifying the causative agent and developing appropriate treatment.
- The case demonstrated the need for further research and improved diagnostic methods for tick-borne illnesses.
- The geographical distribution of Rocky Mountain spotted fever was expanded by this case, challenging previous assumptions about its prevalence.

Quote:

"This was the first warning flare sent up by one of the most respected medical centers in the nation about the unusual outbreak of Rocky Mountain spotted fever."

Chapter 22: "Red Velvet Mites"

This chapter explores Willy Burgdorfer's attendance at an international acarology conference in Austria in 1974. It delves into the personal and professional challenges he faced during that time, including the fading relevance of his work on biological weapons and his involvement in the investigation of tick-borne diseases.

- Willy Burgdorfer attended the International Congress of Acarology in Austria in 1974, where he presented on the status of Rocky Mountain spotted fever in the United States.
- The chapter provides glimpses into Willy's personal struggles, including financial concerns, his wife's declining health, and infidelity.
- The conference featured red velvet mites, known for their romantic behavior, which Willy captured in his film documenting the event.
- Despite the recognition and award he received at the conference, Willy expressed feelings of loneliness and unhappiness.
- Willy's visit to Switzerland after the conference coincided with a change in his financial situation, leading to increased spending and personal indulgence.
- The chapter explores Willy's collaboration with Jorge Benach and their analysis of Rocky Mountain spotted fever cases on Long Island.
- Their research shed light on the severity and complications of the disease and raised questions about the presence of various rickettsia species in ticks.
- The chapter hints at the complexity of tick-borne diseases and the need for collaboration and research to understand them fully.

Quote:

"I had never felt so lonely in my life."

Chapter 23: "Wildfire"

This chapter delves into the outbreak of tick-borne diseases on Long Island, New York, and Lyme, Connecticut, in the mid-1970s. It highlights the efforts of Governor Hugh Carey, the involvement of epidemiologists, and the challenges in understanding and addressing these emerging diseases.

- Governor Hugh Carey initiated a campaign against tick-borne diseases on Long Island, appointing Robert Whalen as the lead investigator.
- Jorge Benach, a young researcher, was tasked with addressing the tick situation and investigating Rocky Mountain spotted fever.
- Benach's collaboration with Willy Burgdorfer led to the identification of multiple rickettsia entities in ticks and the publication of research findings.
- The chapter highlights the challenges faced in diagnosing and understanding tick-borne diseases, including the clustering of cases and the limitations of testing methods.
- The emergence of babesiosis, a malaria-like protozoan infection, on nearby islands raised further concerns.
- The fragmented nature of investigations among different institutions and agencies hindered the coordination of efforts.
- The chapter criticizes the Yale researchers' narrow focus on rheumatology and their failure to consider existing research from Europe on similar diseases.
- The Centers for Disease Control and Prevention (CDC) remained silent on the epidemiological clues and the unusual outbreak, raising questions about the causes and origins of these diseases.

Quote:

"What became apparent was that there was a huge constellation of rickettsia entities in these ticks, and we just didn't know how they worked."

Chapter 24: "Swiss Agent"

This chapter focuses on Willy Burgdorfer's trip to Neuchâtel, Switzerland, in 1978 as part of a government-funded work/study program. It explores his collection of ticks for screening and the discovery of a new rickettsia strain, the Swiss Agent, in the ticks. The chapter also highlights Willy's analysis of the rickettsia and the development of a fluorescent antibody test. However, the Swiss Agent's significance and subsequent disappearance from scientific literature raise questions.

- Willy Burgdorfer, along with a postdoctoral student and Professor André Aeschlimann, collected thousands of ticks in Neuchâtel, Switzerland, to screen them for rickettsias.
- The trip was initially intended to investigate if a rickettsia, possibly Q fever, was affecting Swiss goatherds.
- Willy discovered three previously unseen microbes in ticks: an unidentified spotted fever rickettsia, *Trypanosoma theileri* (a cattle protozoan similar to babesia), and the infectious larval stage of a parasitic deer worm.
- The rickettsias were found throughout the tick's body, raising concerns about their ability to spread rapidly through tick eggs.
- Willy developed a fluorescent antibody test to detect infected ticks, lab animals, or humans by labeling unique antigens and observing the immune system's response.
- The test results suggested that the rickettsias from Switzerland and those found in the Lyme disease outbreak on Long Island might be closely related.
- The Swiss Agent rickettsia mysteriously disappeared from scientific discussions, and Willy's communication with colleagues hinted at doubts about its pathogenicity.
- The chapter raises questions about the Swiss Agent's sudden absence from scientific literature and the reasons behind its disappearance.

Quotes:

"In short, the disease clusters in Connecticut and Long Island seemed to have been caused by Swiss Agent USA."

"And about two years later, Willy announced that a spirochete was the causative agent of Lyme disease. Case closed."

Chapter 25: Collateral Damage

In Chapter 25, the focus shifts to Willy Burgdorfer's personal experiences with Lyme disease and his later years. In 1983, while cleaning rabbit cages in his lab, Willy had a splash of Lyme-infected rabbit urine in his eyes, resulting in bull's-eye rashes and a suspected Lyme disease infection. Despite a negative Lyme antibody test, Willy believed he had Lyme disease and attributed the negative result to early antibiotic treatment suppressing the immune system reaction. Willy continued his research, but retired in 1986 to care for his wife, Dale, who had ongoing health issues. Dale suffered a brain aneurysm and stroke, which left her partially paralyzed. She passed away in 2005. After Dale's death, Willy married Lois, his former neighbor and friend. Willy died in 2014 from complications of Parkinson's disease. Posthumously, Willy's hidden documents and a Swiss bank account raised questions about his financial situation and the significance of a sticky note confession found among his belongings. Lois shared that Willy had mentioned visits from government agents, but their purpose remains unconfirmed.

Important takeaways from Chapter 25:

1. Willy Burgdorfer experienced a suspected Lyme disease infection after exposure to infected rabbit urine.
2. Despite a negative Lyme antibody test, Willy believed he had Lyme disease due to early antibiotic treatment.
3. Willy retired in 1986 to care for his wife, Dale, who suffered health issues.
4. Dale experienced a brain aneurysm and stroke, leading to her partial paralysis.
5. After Dale's death, Willy married Lois, who provided care and support during his declining health.
6. Willy's financial situation, including a Swiss bank account and life insurance policies, raised questions about his wealth accumulation.
7. A sticky note confession found among Willy's documents intrigued researchers but lacked clear context.
8. Lois mentioned Willy's claim of visits by government agents, but the purpose and details remain unconfirmed.

Quotes:

"The message was in Willy's distinctive handwriting, in the red felt pen he always used when he wanted to highlight something important. It seemed like a message from the grave."

"There is, without a doubt, something suspicious about the sudden disappearance of the Swiss Agent USA from all correspondence."

Chapter 26: Discovery

In Chapter 26, the author reflects on their research journey and the need for independent verification of their findings. They pitch the story to investigative journalist Charles Piller, who agrees to research, write, and publish the story independently. Piller's article reveals that the Swiss Agent, a rickettsia mentioned by Willy Burgdorfer, could still be causing illness in some individuals, potentially being mistaken for Lyme disease or co-infecting Lyme patients. The article fails to uncover new leads or whistleblowers, but it generates hope for future progress.

Important takeaways from Chapter 26:

1. The author seeks independent verification of their findings by collaborating with investigative journalist Charles Piller.
2. Piller's article suggests that the Swiss Agent could still be causing illness and complicating the diagnosis and treatment of Lyme disease.
3. Interviews with researchers and experts do not shed light on the mystery surrounding the Swiss Agent.
4. The article's publication aims to encourage further investigation and potentially attract the attention of microbiologists.
5. The history of Lyme disease suggests a possible connection to military open-air tests of aerosolized bacteria and ticks.
6. Willy Burgdorfer's involvement in investigating outbreaks and his recognition of different rickettsias raise questions about the Swiss Agent.
7. Willy's omissions of the Swiss Agent findings from Lyme disease articles raise ethical concerns.
8. The chapter ends with the author contemplating the guilt Willy felt, potential cover-ups, and the origins of the Long Island outbreak.

Quote:

"The evidence is hardly conclusive, patients and doctors might be mistaking under-the-radar Swiss Agent infections for Lyme, the infectious disease specialists said. Or the bacteria could be co-infecting some Lyme patients, exacerbating symptoms and complicating their treatment—and even stoking a bitter debate about whether Lyme often becomes a persistent and serious illness."

Chapter 27: DNA Detectives

Chapter 27 focuses on the author's attendance at the American Society for Rickettsiology meeting and their efforts to gather information on spotted fever rickettsias and the Swiss Agent USA. The author observes the stark difference in openness between rickettsia researchers and Lyme disease researchers, attributing it to financial interests and the profit-driven nature of Lyme disease diagnostics and vaccines. The author learns about advancements in rickettsia genetics, including genetic manipulation techniques, and encounters experts who challenge long-held beliefs about rickettsial infections.

Important takeaways from Chapter 27:

1. The author attends the American Society for Rickettsiology meeting to learn about spotted fever rickettsias and gather information on the Swiss Agent USA.
2. Rickettsia researchers are more open and welcoming compared to Lyme disease researchers due to financial interests surrounding Lyme disease.
3. Advances in genetics, such as genetic manipulation and sequencing techniques, enable deeper understanding of rickettsia species and infection mechanisms.
4. The author interacts with researchers studying rickettsial genetics, such as Ulrike Munderloh and David H. Walker, who challenge established beliefs in the field.
5. The author reflects on the overlooked threat of rickettsial infections compared to the focus on Lyme disease diagnostics and vaccines.
6. The discovery of an unnamed rickettsia strain, WB-8-2, is connected to the author's search for the Swiss Agent USA.
7. Genetic analysis reveals surprising Old World/New World genetic mashup in rickettsia strains, challenging natural evolutionary processes.
8. The author contemplates the need for present-day patient samples to test for the presence of Swiss Agent USA in Lyme disease patients.

Quote:

"When I summarized the clues that Willy had left me on Swiss Agent USA, Munderloh guessed that it was probably *Rickettsia buchneri*, a close relative of spotted fever rickettsias that were not infectious to humans, perfectly adapted to living inside deer ticks."

Chapter 28: Change Agent

In Chapter 28, the author meets with a physician at Stanford's School of Medicine to discuss an article about a patient with a mysterious condition similar to Lyme disease. The physician and his team were the first to identify unique immune system molecules in the blood of these patients, providing evidence of a real disease. The author sees a potential ally in the physician and learns that he has collected blood samples from hundreds of patients, some potentially with tick-borne diseases. The author asks if the samples are being screened for rickettsias, which leads to a potential collaboration.

Important takeaways from Chapter 28:

1. The author meets with a physician at Stanford to discuss an article about a patient with a mysterious condition similar to Lyme disease.
2. The physician's team identifies unique immune system molecules in the blood, confirming the existence of a real disease.
3. The author sees an opportunity for collaboration with the physician, as they both share a concern for patients who have been overlooked by the medical system.
4. The physician has collected blood samples from hundreds of patients, some potentially with tick-borne diseases.
5. The author asks about screening for rickettsias in the samples, which could uncover valuable information.

Quote:

"When you came to my clinic before, we weren't allowed to treat chronic Lyme disease. It was department policy. I'm sorry."

Chapter 29: Sins of our Fathers

In Chapter 29, the author has a conversation with their father, who reveals his involvement in transporting Agent Orange to Vietnam during his time as a navy pilot. The author reflects on the ecological destruction caused by Agent Orange and the connection between their father's work and Willy's bioweapons projects at Fort Detrick. The author also discusses their mother's mental decline, possibly linked to tick bites and Lyme disease.

Important takeaways from Chapter 29:

1. The author's father reveals his role in transporting Agent Orange to Vietnam, causing devastation and long-lasting health effects.
2. The author reflects on the connection between their father's work and Willy's bioweapons projects at Fort Detrick.
3. The author's mother experiences mental decline possibly linked to tick bites and Lyme disease.
4. The author's parents' experiences highlight the difficulty of uncovering Cold War secrets and the impact they can have on individuals and their families.

Quote:

"It's hard to believe that this was the same person who... went on to design historic building restorations in Washington, DC; build stately mansions in Northern Virginia; and fly airplanes."

Chapter 30: Surrender

In Chapter 30, the author travels through Montana and visits the site of the Battle of Big Hole, a bloody conflict between the U.S. government and the Nez Percé tribe. The author reflects on the ecological disruption caused by settlers in the Bitterroot Valley, leading to the proliferation of ticks and the spread of spotted fever. The author draws parallels between the destructive wars of the past, such as the Cold War bioweapons race, and the need to understand the truth to avoid repeating mistakes.

Important takeaways from Chapter 30:

1. The author visits the site of the Battle of Big Hole, reflecting on the senseless conflict between the U.S. government and the Nez Percé tribe.
2. The author connects the ecological disruption caused by settlers in the Bitterroot Valley to the spread of tick-borne diseases like spotted fever.
3. The author highlights the destructive nature of past wars, including the Cold War bioweapons race.
4. Understanding the truth is crucial for learning from past mistakes and finding solutions to current problems.

Quote:

"It's hubris to think that we can weaponize living things and not have them come back to bite us."

Epilogue: Palo Alto, California, 2018

In the epilogue, the author reflects on the tick-borne disease outbreak that started in 1968, considering it one of the worst public health failures in recent history. The myopic focus on Lyme disease has led to treatment delays and fatalities in patients with mixed infections. The author calls for rapid screening tests and freedom for physicians to use clinical judgment in treating complex cases. The book sheds light on the U.S. military's experiments with ticks and tick-borne diseases as biological weapons, emphasizing the need for declassification to address the damage caused. The author discusses the origin of the tick-borne disease outbreak, believing it to be a deliberate release or accident, but lacking verifiable documents. Extraordinary efforts are needed to fix the imbalance in the ecosystem and address the reluctance to test and treat tick-borne diseases. The author calls for action from the CDC, DNA detectives, epidemiologists, bioinformaticians, and the next generation of scientists to pursue solutions.


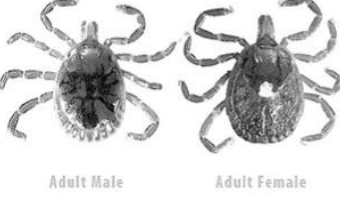


Important takeaways from the Epilogue:

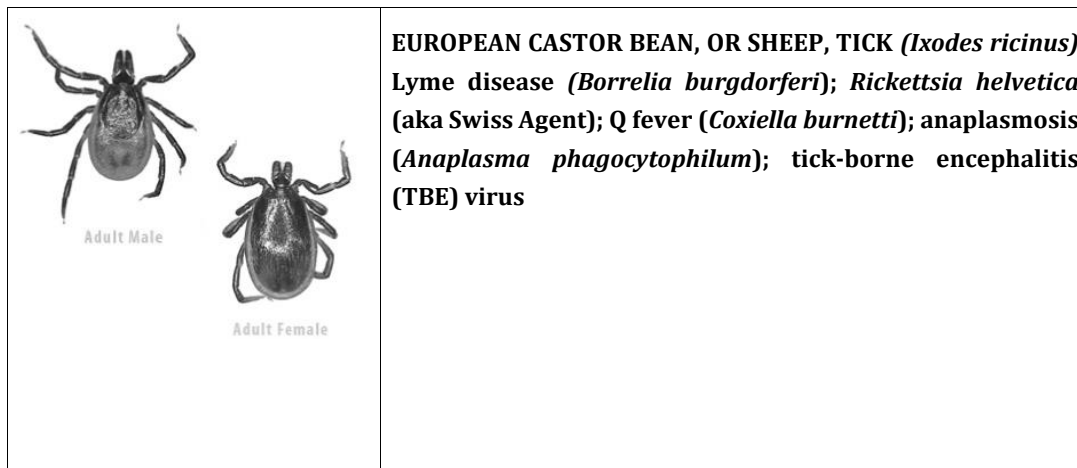
1. The tick-borne disease outbreak is considered a major public health failure.
2. The myopic focus on Lyme disease has led to delays and fatalities in patients with mixed infections.
3. Rapid screening tests and clinical judgment freedom for physicians are urgently needed.
4. The U.S. military has conducted experiments with ticks and tick-borne diseases, requiring declassification to address the damage caused.
5. The origin of the tick-borne disease outbreak remains uncertain, but deliberate release or accident is suspected.
6. Efforts are needed to address the ecosystem imbalance and improve testing and treatment for tick-borne diseases.
7. The CDC, DNA detectives, epidemiologists, bioinformaticians, and the next generation of scientists play crucial roles in pursuing solutions.
8. Action is needed to streamline surveillance, decode pathogen genomes, analyze disease spread, and encourage young scientists.

Quote:

"My hope is that this book will widen the lens on our view of this problem and inspire people to more aggressively pursue solutions."

Appendix I: Ticks and Human Disease Agents

 <p>Adult Male Adult Female</p>	<p>EASTERN BLACKLEGGED, OR DEER, TICK (<i>Ixodes scapularis</i>; old name: <i>Ixodes dammini</i>) Lyme disease (<i>Borrelia burgdorferi</i>, <i>B. mayonii</i>); babesiosis (<i>Babesia microti</i>); anaplasmosis (<i>Anaplasma phagocytophilum</i>); relapsing fever (<i>Borrelia miyamotoi</i>); Powassan virus; Ehrlichiosis (<i>Ehrlichia muris eauclairensis</i>)</p>
 <p>Adult Male Adult Female</p>	<p>LONE STAR TICK (<i>Amblyomma americanum</i>) Rocky Mountain spotted fever (<i>Rickettsia rickettsii</i>); human ehrlichiosis (<i>Ehrlichia chaffeensis</i>, <i>Ehrlichia ewingii</i>); tularemia (<i>Francisella tularensis</i>); Heartland virus disease</p>
 <p>Adult Male Adult Female</p>	<p>AMERICAN DOG TICK (<i>Dermacentor variabilis</i>) Rocky Mountain spotted fever (<i>Rickettsia rickettsii</i>); tularemia (<i>Francisella tularensis</i>); tick paralysis (caused by a tick saliva toxin)</p>
 <p>Adult Male Adult Female</p>	<p>ROCKY MOUNTAIN WOOD TICK (<i>Dermacentor andersoni</i>) Rocky Mountain spotted fever (<i>Rickettsia rickettsii</i>); Colorado tick fever virus; tularemia (<i>Francisella tularensis</i>); tick paralysis (caused by a tick saliva toxin)</p>



Appendix Chart: American ticks courtesy of University of Rhode Island TickEncounter Resource Center, *Ixodes ricinus* ticks courtesy of Bristol University

Appendix II: Uncontrolled Tick Releases, 1966–19691

LOCATION	DATE	TICK SPECIES	RADIOACTIVE MARKER	NUMBER RELEASED
MONTPELIER, VA				
	Aug. 11, 1966	American dog tick (<i>Dermacentor variabilis</i>)	Carbon-14	29,750
	Aug. 29, 1966	American dog tick (<i>Dermacentor variabilis</i>)	Carbon-14	12,400
	Sept. 18, 1967	Lone star tick (<i>Amblyomma americanum</i>)	Carbon-14	15,500
	Aug. 4, 1968	Lone star tick (<i>Amblyomma americanum</i>)	Carbon-14	50,000
	Aug. 28, 1969	Lone star tick (<i>Amblyomma americanum</i>)	Carbon-14	17,500
NEWPORT NEWS, VA				
	Sept. 12, 1967	Lone star tick (<i>Amblyomma americanum</i>)	Carbon-14	22,000
	Aug. 28, 1968	Lone star tick (<i>Amblyomma americanum</i>)	Carbon-14	47,000
MILL CANYON, MT				
	Aug. 28, 1966	Rocky Mountain wood tick (<i>Dermacentor andersoni</i>)	Carbon-14	22,500
	July 19, 1967	Rocky Mountain wood tick (<i>Dermacentor andersoni</i>)	Carbon-14	21,600
ROARING LION CANYON, MT				
	July 3, 1968	Rocky Mountain wood tick (<i>Dermacentor andersoni</i>)	Carbon-14	16,200
	July 19, 1969	Rocky Mountain wood tick (<i>Dermacentor andersoni</i>)	Carbon-14	20,250
	July 19, 1969	Rocky Mountain wood tick (<i>Dermacentor andersoni</i>)	Iodine-125	8,100
TOTAL				282,800