

Research Article

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Eco-Thrax: Anthrax Narratives and Unstable Ground

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Abstract: Numerous articles predicting pandemic futures identify threats tied directly to a warming planet. One notable example is the threat of once-stable pathogens held in ice shelves being released into the world. *Bacillus anthracis*, or anthrax, presents as the key bacterial threat emerging from melting permafrost. Such a threat reads like a fictitious horror brought into direct proximity with the real. Exploring perceptions of microbes across time and the resonance of specific tropes in television and eco-horror in the context of anthrax reveals an unstable theoretical and ecological landscape characterized by shifting human/biological relationships. Untangling this relationship more than 20 years after the last great anthrax-related challenge – the “Amerithrax” incident – and in recognition of the impact of COVID-19 on contemporary environmental humanities, it becomes possible to think of contagion as more than an epidemiological threat. Instead, contagion, as related to anthrax, can be identified as a window across time and place, one which assists in rethinking relationships to ecologies and environments. Two theoretical frameworks, the “outbreak narrative” as proposed by Priscilla Wald and the “hijacker model” introduced by Hannah Landecker, are deployed as lenses to introduce and think differently anthrax’s contemporary condition.

Keywords: anthrax, pandemics, Anthropocene, eco-horror, outbreak narratives

1 Introduction

In her 2008 text *Contagious: Cultures, Carriers, and the Outbreak Narrative*, literary scholar Priscilla Wald recognizes that “Contagion is more than an epidemiological fact. It is also a foundational concept in the study of religion and of society, with a long history of explaining how beliefs circulate in social interactions” (p. 2). She draws attention to a key quality of contagion: transmissibility as evidence not only of biological/microbial encounter but also as social, cultural, and ideological connectivity. As seen through the COVID-19 pandemic, transmission, though once local, has become truly global – identified in the rapid shuttering of borders, grounding of flights, social distancing guidelines and stay home directives, and the spread of the virus regardless. Through the lens of the contemporary crisis, relationships between society, culture, ecology, and the microbial world are thrown into sharp relief. Turning this lens toward *Bacillus anthracis*, epidemiological threats of the past and the future reveal a complex network of connectivity across culture, ecology, biology, politics, place, and time. This network can be traced across film, television, and contemporary theory, in which fears for environmental futures find themselves in a complicated tangle with specifically US-centric histories of terror and destabilizations of ecological landscapes seeded through news reports and journalistic reportage.

Lowe (2022), in the context of COVID-19 and conspiracy, writes:

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Viral worlds are a key site from which to explore questions of the real. The “real” is often understood to be epistemologically associated with the visible. Yet, viruses are “unseens,” meaning they are not accessible to unaided visual perception, proprioception, or interoception.

The real and the metaphorical, epidemiological fact and belief; these entangled contexts are the spheres in which specific biological actants can be located, spheres in which the real, as located amidst a rapidly warming globe, can be understood. Lowe’s observation, when brought into contact with Wald’s understanding of contagion, illuminates the significance of human/microbial interactions in contemporary thought and media. In her text, which takes *Bacillus anthracis*, or anthrax, as its focus, medical historian Jones (2010) positions historical and contemporary encounters and ideas around anthrax as “windows into the constantly changing ecological and cultural relationships between animals, the environment, and human society and culture” (para. xvii). These windows provide an illumination of specific human/bacterial contact, which resounds amidst a contemporary era wherein microbes emerge as one among many global threats. One such window is contemporary media; this article will attend to anthrax as it appears in serialized television, alongside broader renderings of eco-horror tropes in cinema. Read through and alongside contemporary scholarship, these windows sharpen the view of a complex and entangled landscape in which the “unseen” can be brought into view.

2 Hijacking the Anthrax Narrative

Before apprehending anthrax through the window of contemporary media, or in the context of encounter and contagion, the nature of the bacterium needs clarification. First, “anthrax” is the name given to the bacteria itself, the biological weapon, as well the disease that emerges from exposure. This disease has multiple forms, which depend on the mode of exposure. Cutaneous anthrax is the most common and least deadly disease, arising from skin contact with anthrax spores. Inhalational anthrax is less common, but far more fatal, caused by inhaling the bacterial spores. This form of anthrax has been known as “Woolsorter’s disease,” a historically industrial disease affecting those working directly with animal hides in slaughterhouses or the production of leather garments, for example. Susan D. Jones and historian Philip M. Teigen (2008) illuminate the contemporary history of anthrax as an industrial disease, while highlighting the centrality of anthrax to broad research undertaken by noted microbiologists Robert Koch and Louis Pasteur in the late 1800s (Jones and Teigen, 2008, pp. 456–457). The apprehension of anthrax in the contemporary period is transformed against this historical background, through its entanglement with militarization and terrorism, alongside subsequent mobilization as a cultural motif in television and cinema.

Considering the contemporary condition of anthrax, there are two significant theoretical frameworks that provide a boundedness through which anthrax can be perceived. One is the established notion of the “outbreak narrative,” as presented by Wald (2008, p. 2). An outbreak narrative is the “paradigmatic narrative” of the spread of a disease, one that “follows a formulaic plot that begins with the identification of emerging infection, includes a discussion of the global networks throughout which it travels, and chronicles the epidemiological work that ends with its containment” (Wald, 2008, p. 2). The outbreak narrative presents a useful framework for the consideration of the stories that are told about emergent diseases and infections, but as it is explored, this narrative can be necessarily complicated by the shifting and changing natures of human/disease relationships. As Wald herself acknowledges, the outbreak narrative presents “a battle between the enemy microbe and the heroic researchers and epidemiologists over the fate of humanity,” with epidemiologists often emerging as triumphant saviors. This latter point is underscored specifically through perceived veracity of the containment, which, as this article will address, is a more complicated idea than a neat outbreak narrative might indicate.

As science, society, and academia reckon with the impact of COVID-19, extensive discourse interrogating human/microbial relationships has emerged. Much of this discourse focuses on the viral qualities of COVID-19; however, this does not completely exclude its correlation to bacteria and other microorganisms. In a 2022 article titled “Viruses Are More Like Cone Snails Than Hijackers,” theorist Hannah Landecker writes, “In the twentieth century, the word ‘hijacking’ came to typify the explanation of what viruses do to the cells they

infect” (para. 1). While a virus needs a host to survive, a bacterium is a single-celled organism and does not need to “hijack” a living host to reproduce. However, Landecker (2022) quite aptly utilizes the notion of hijacking to reveal the entanglement of a virus with other bodies, human and nonhuman alike. Landecker (2022) writes of hijacking:

It transposes the idea of an individual or a group of individuals storming a vehicle and overwhelming its drivers and passengers by force; of a temporary and illegal deviation of a normal journey; of violence and coercion in the name of another cause. The hijacker is a terrorist, a thief, a stranger looking to take the wheel. (para. 3)

Implicit in this framing is the transposition of ill-will as a motivator for the virus. This hijacker model, whilst a viral model, is an example of the applications of viral theories emerging from COVID-19 in the context of other microorganisms. As it relates to anthrax, the hijacker model is particularly resonant due to the weaponization and deployment of anthrax as a bioweapon in the early 2000s.

The October 2001 anthrax attacks in the United States – the “Amerithrax” incident – saw weaponized, refined, lab grown anthrax enter into public circulation through the US postal system in an act of terror. Postal workers and political targets were exposed to powdered and granulated anthrax, which caused both cutaneous and the far-deadlier inhalational anthrax. Killing five people and infecting at least 18 across a month-long period, these attacks led to what was then seen to be the largest FBI investigation in the history of the organization, while fear and panic spread across the nation, and the globe. This period of time in the US history was marked by widespread anxiety in the wake of the September 11 terror attacks, when four coordinated suicide attacks coordinated by Al-Qaeda resulted in substantial loss of life on the US soil. These aerial attacks were undertaken by hijacking passenger planes, resulting in the collapse of the World Trade Center twin towers in New York City in 2001. In working within what was a climate of heightened anxiety, fear and terror literary theorist Redfield (2009) remarks on the centrality of the “political history of the phantom” drawing upon a Derridean foundation of contemporary critique, which recognizes the “spirit of haunting” as the representation of terrorism, a recurring political wound across time (p. 7).

Within this shadowed and shadowy space of terror and haunting, “anthrax” was hijacked through the weaponization of the bacterium’s spores, spreading and circulating unseen within the traditionally safe hands of the postal service. Immediately, media and society developed an emergent literacy in relation to anthrax, with articles outlining the impacts of granulation and spore dispersal in terms of infection rates as the antibiotic ciprofloxacin (“cipro”), used to treat anthrax exposure, underwent a US-wide shortage. Swiss historian Philipp Sarasin gave great attention to anthrax, and the anthrax attacks in his 2004 text, translated in English in 2006 as *Anthrax: bioterror as phantasm, (or fact and fantasy)*. Within this text, Sarasin (2006) wrote that anthrax spread in September 2001 not only through four letters circulating through the US Postal system, but in the thousands of potentially contaminated letters (p. 5). These thousands were contaminated, hijacked, by an imaginary anthrax – and with this came the subsequent spread of fear and panic. Anthrax, the microbe, became anthrax the metaphor.

Metaphors, Sarasin (2006) acknowledges, are a form of contamination – transferring meaning from one realm to another (p. 5). Anthrax became a metaphor for bioterrorism, a specific type of warfare, for the spread of sickness does not simply harm the individual but constitutes an attack on society. While Sarasin (2006) dismisses fears of anthrax contamination as a passing hysteria (even a mere three years following the attacks), anthrax is a bacterium that has entered into cultural shorthand (p. 10). Early representations of anthrax on television see the bacterium obscured by a murder investigation. A 1963 episode of *The Alfred Hitchcock Hour* titled “Diagnosis: Danger” is centered around an apparent hit and run (Pollack and Kibbee, 1963). The subsequent investigation reveals not a murderous rampage, but death caused by anthrax spores in the hide of a drum that spreads fear and sickness across Los Angeles.¹ Post-2001 television grasps upon the shorthand of anthrax, particularly in police procedurals, serving to further plots about fear of contamination spreading through populations at the hands of some malevolent human or political force.

¹ Coincidentally, this narrative correlates with the 2006 death of a drummer in the United Kingdom from inhalational anthrax. The Scottish artist died after becoming infected through contact with untreated animal hides used to make instruments (Carvel, 2006).

Employing tropes of the outbreak narrative, the eighth season of the US television procedural *Criminal Minds* sees FBI agents investigate a domestic terror attack. The episode “Amplification” directly invokes the 2001 Amerithrax incident, but focuses upon a fictionalized attack motivated by a perceived lack of governmental preparedness for large-scale bioterrorism on the US soil (Gallagher, 2009). Particular tropes of containment and accident are invoked through the sealing-off of a homemade laboratory and through scientists clad in PPE. This episode ends with the suspect apprehended and the lab grown, virulent strain of the bioweapon locked away in an anonymous government vault – filled with thousands of other deadly viral and bacterial agents. Here, the notion of containment is represented with an undercurrent of anxiety and conspiracy. This scene, captured by a wide and retreating lens, appears to point back to pre-2001 television, namely, recurring tropes from *The X-Files* of hidden government secrets connected to weaponized microbial infections (Carter et al., 1993–2018). *The X-Files* itself contains its own gestures toward anthrax-related fears in later seasons. The threat of anthrax emerges as a result of its recent history, but also in the extent to which its use as a weapon violates the rules of engagement – specifically the global Biological Weapons Convention (1972).²

The fear associated with anthrax is specific, historically generated, and culturally performed, but not solely unique to anthrax. Indeed, following Landecker’s hijacker model alongside many anthropomorphic, value-laden readings of viral and bacterial agents, we can begin to understand perceptions of microbes in the present. Some of the earliest representations of germs – those unseen agents of disease – position them as grotesque and malicious forms. An 1828 etching of the waters of the Thames under a microscope depicts bacteria as monstrous forms, gawping, fanged, freakish, and eerie (Heath, 1828). The woman witnessing this magnified drop of water is turned toward the viewer with a look of horror. These chimeric, threatening forms bring with them a wave of revulsion and fear. At the time of this etching, microorganisms had been known and observable for almost 200 years, yet despite the rapid advances of technology in the near-200 years since the etching, the rendering of viruses and bacteria as monstrous forms persists. Indeed, amidst the post-2001 security context and the presence of weaponized bacteria, microbes are apprehended as “‘public enemies far more dangerous’ than the criminals on the FBI’s Most Wanted lists,” as recognized by Wald (2008, p. 25, referencing Ratcliff, 1959, p. 21). With the spread of COVID-19 came new iterations of these same value judgments. A 2021 article published in the *European Archives of Oto-Rhino-Laryngology* branded COVID-19 as an evil serial killer (Guha et al., 2021). The opening paragraphs of this article describe a serial killer as “a murderer who repeatedly commits the same offense,” ascribing to COVID the characteristics of willfulness and intentionality of murder (Guha et al., 2021, p. 2101). With anthrax, the threat of harm against the human body emerges through encounter with the bacterium, amplified by the threat of the terrorist.

Perceptions of the microbial agent as a willingly hostile entity, as a hijacker and a threat, create conflict for the boundedness of the outbreak narrative. Albertini (2008) recognizes a tension within the outbreak narrative, which arises through containment and accidental exposure. He writes that the “epidemiological effort is an urge toward ... ‘closure,’ but the spectacular accident [of initial exposure and spread] resists closure, instead lingering in its own rupture within the narratable” (p. 472). This rupture reveals the “fragility of the body’s barriers,” reinforcing the divide between the individual body and the invading threat (Albertini, 2008, p. 444). In the aforementioned example from procedural television, the accidental encounter between a heroic investigator and an anthrax vial creates narrative tension. A clumsy gesture and an accidental scrape lead the FBI investigator in “Amplification” into a moment of contact with the microbe, a moment that underscores the fragility of the body amidst the potential for infection. What makes anthrax a key bacterium for contemporary attention is not simply its legacy as weaponized agent of terror and “character” within the outbreak narrative but, more so, as the future landscape of anthrax-related encounters.

² Opened for signature in 1972, the Biological Weapons Convention, is signed by over 170 international parties, recognizing global efforts to halt the use of biological weapons, specifically as weapons of mass destruction.

3 Microbial Perceptions and a Warming Planet

In the 2022 article “Welcome to the ‘pandemicene’: Is Australia ready for the next pandemic?,” Professor Catherine Bennett, Deakin University’s Chair of Epidemiology, speaks about current and future epidemiological threats (Nogrady, 2022, para. 3–8). In these considerations, she encourages the discipline of epidemiology to embrace thinking like a microbe. This way of thinking is presented in the context of “how we work, how we live, how we build those structures – physical, social and economic” that allow pathogens to spread, take hold, and rise to the level of a pandemic (Nogrady, 2022, para. 3). Implicit in these words is a multispecies approach, but one that is relational, not predicated on the willful devastation of human populations, but rather, as a consequence of human behaviors. This way of thinking complicates the pattern of the outbreak narrative, which posits threat from an Other (usually outside of traditional Western centers of power), and in terms of the killer, the “Most Wanted,” and the threat to the porous body. Looking to anthrax outbreaks, which scientists predict will increase in occurrence relative to global heating, a cultural framework which simultaneously shapes and represents these fears emerges. This framework can be understood in explicitly human terms, revealing the narratives told across fiction, in response to contemporary environmental challenges.

Introducing the “Anthropocene” in 2002 as a geological epoch encompassing the environmental changes, disturbances, and harms undertaken by a specific subset of humanity, Crutzen (2002) writes, “Unless there is a global catastrophe – a meteorite impact, a world war or a pandemic – mankind *[sic]* will remain a major environmental force for many millennia” (p. 23). This “environmental force” is the result of increasing resource consumption, species extinction, temperature, and pollution – the innumerable human-caused events and processes now shaping the Earth and its dynamics. Fixing the Anthropocene in time, place, or origin, however, is a complex task – with multiple “-cenes” emerging from each attempt to deviate from the homogenous attribution of blame to the human (Davis et al., 2019). These multiple “-cenes,” which consider relationships across widespread climate catastrophes and increasing catastrophic environmental events, reflect upon the “interrelated historical processes set in motion by a small minority”: a white colonial minority (Davis et al., 2019, p. 4). Merchant (2020), writing in *The Anthropocene and the Humanities* endorses the need for a “global ecological revolution” to transform human–human and human–environmental relationships in recognition of the severity of the current climate crisis (p. 155).

With this brief acknowledgement of climate crisis and catastrophe, the key anthrax-related challenge for the present shifts. The fear is no longer the threat of anthrax related to a human agent attempting to spread fear and panic through a population, but instead the fear is of exposure arising from anthropogenic environmental conditions. In the context of the outbreak narrative, which is seen to “consistently register anxieties about the global village that reflexively imagine the containment of disease in national terms against its actual and threatened border crossings,” anthrax is complicated. According to a source of national anxiety and fear in the context of the Amerithrax incident, anthrax is rather understood as border crossing in the same way that climate crisis and the Anthropocene are simultaneously global and local (Wald, 2008, p. 63). This emergent anxiety is that of the unfolding climate crisis, the contested but very real effects of the “Anthropocene” impact all environmental cycles of the globe, and are currently leading to widespread global permafrost melts. Permafrost, a layer of rock and soil frozen for greater than 2 years and less susceptible to the impacts of seasonal change, covers approximately 19 million km² of land across Alaska, Canada, Greenland, and Siberia (Tarnocai et al., 2009). Permafrost stability is shifting as a result of the current climate crisis, registering average temperature increases of one degree annually. With melting permafrost comes the release of that which it contains, which studies identify as between 1 and 1,000 million bacteria per gram of permafrost soil (Hansen et al., 2007, p. 2870). With this destabilization comes the threat of dormant anthrax spores – frozen, contained and preserved in this permafrost – rising to the surface and infecting new populations, a narrative that reads less like a traditional outbreak narrative and more like a particular form of real-life ecohorror.

A study by French and Russian researchers published in the *Proceedings of the National Academy of Sciences (PNAS)* in 2014 revealed the presence of a 30,000-year-old virus within layers of Siberian permafrost, which scientists were able to resurrect (Legendre et al., 2014, pp. 5327–5335). An outbreak of anthrax in Russia in 2016 that led to over 100 hospitalizations and the death of a child was directly related to permafrost melts connected to rising temperatures (Liskova et al., 2021, para. 5), exposing humans to long-dormant spores held

in animal bodies preserved in frozen earth layers. In another example, increased permafrost melts as a result of unseasonably warm temperatures exposed 70-year-old frozen deer carcasses to the air, and subsequently revived dormant anthrax spores. In 2019, the US National Academies of Sciences, Medicine, and Engineering organized a workshop titled “Understanding and Responding to Global Health Security Risks from Microbial Threats in the Arctic,” which specifically recognized the very real and present threat of anthrax exposure due to melting ice. Studies of and research into these events have led to a myriad of news articles with titles warning that “As Permafrost Melts It Is Unleashing Ancient Viruses” (Chognot, 2020), “As Earth Warms, the Diseases That May Lie within Permafrost Become a Bigger Worry” (Goudarzi, 2016), and “The Next Pandemic Could Be Hiding in the Arctic Permafrost” (Schreiber, 2020).

The most analogous connection between these contemporary realities is John Carpenter’s 1982 film *The Thing*, in which an alien craft buried deep under layers of snow in the Antarctic releases a monstrous and mutating virus upon a team of researchers. Similar narratives appear in perhaps less critically acclaimed science fiction and horror films, including *The Thaw* (Lewis, 2009), in which an ancient virus is unleashed from melting ice caps; *Blood Glacier* (Kren, 2013), a similar narrative set in the melting Austrian Alps; *The Last Winter* (Fessenden, 2007), in which a fictional US oil company drilling in the Arctic releases a malevolent petrochemical creature; or, (potentially the origin for this specific genre) 1953’s atomic-monster-era film *The Beast from 20000 Fathoms* (Lourié, 1953), in which an atomic bomb releases a dinosaur from the clutches of Arctic ice to wreak havoc upon “America.” What draws these films together is the fictionalized representation of a very real threat, the release of an environmental harm as a consequence of human intrusion or ecological devastation. Within these stories is a narrative warning, one which contrasts with the outbreak narrative, but still preserves some identifiable correlations. Within the traditional frame of the outbreak narrative, warnings emerge through a Western, colonial, and deeply racialized fear of the “other” embedded in transformative globalization (Wald, 2008, p. 81). Embedded within the fear of contagion in this sampling of eco-horror films, is a fear of the consequences of misled, but widespread, everyday behavior. Like the atomic monster genre, which explores fears and anxieties in response to the terror of scientific developments and their potential for destruction, seeded into narratives around environmental horrors lying frozen within the Earth is a communicable fear for the future. This fear for the future is analogous to “eco-anxiety,” defined as “distress caused by climate change where people are becoming anxious about their future” (Coffey et al., 2021, p. 1). As Colebrooke (2014) acknowledges in her essays on extinction that address the global backdrop of the last decades, amidst terrorism, large-scale environmental disasters, wars, pandemics, and increasing societal polarization, “These terrors – viral, political, economic, climactic and affective – have not failed to dent the cultural imaginary” (p. 68). These terrors can be read in the transforming popular culture film and literature that address questions of infection through the lens of ecology.

As Wald (2008) establishes and Albertini (2008) recognizes, containment is a significant element in the progression of the outbreak narrative – a denouement in which the infection is bounded, and the success of epidemiological methods prevails. In the specific subset of eco-horror films that address hidden threats in once-stable ice, the final scenes often do not display successful containment, but rather explicitly present scenes of infectious agents or animals continuing to spread, or hint at the horror persisting. This grouping of films can be read as a form of contemporary eco-horror, a new iteration of the genre that dominated film screens of the 1970s.³ Understanding the connection between traditional eco-horror and contemporary eco-horror illuminates how structures of thought, fear, and anxiety condition contemporary apprehensions of microbial matter. As a historian of horror, film and literature Murphy (2013) writes:

³ The archetypal eco-horror film of this period, emblematic of the genre, is the cult Australian classic *Long Weekend* from 1978. This film sees an environmentally destructive couple in the Australian outback attacked by birds, spiders, and possums, in a narrative which feeds into broader cultural anxieties of white panic and the “other,” which was emblematic of the time (Morris, 2005, p. 225). Significantly, this film is couched in colonial anxieties and legacies of invasion, traced back to the genocidal occupation by the British Empire of a continent perceived as hostile in the 1700s.

[W]hilst the ‘nature strikes back’ horror films of the 1970s are obviously linked to the sense of ecological crisis that become a part of American life following the publication of [Rachel Carson’s] *The Silent Spring*, they also belong to the much longer tradition of American narratives in which the natural world and the landscape itself are seen as actively hostile. (p. 181)

This aligns with what Estok (2009) recognizes in the present, namely that “[h]uman history is a history of controlling the natural environment,” and identifies ecophobia – a fear of the environment rooted in ideas around sanitation and order – as “one of the hallmarks of human progress” (p. 210). In recognition of these psychological frameworks, and their influence on literature, contemporary eco-horror is understood to be predicated on an unstable, shifting ecological present, with environments harmed, altered, or degraded by human activity, “striking back” at their occupiers.⁴

Contemporary scholarship addressing this genre in film and literature recognizes connections between the emerging narratives and related shifts in the broader environmental imaginary. Concretely, Tidwell and Soles (2021) establish that contemporary eco-horror can be “read as a response to real world environmental fears” at the intersection of fear and global, planetary scales (p. 2). Particularly, as Keetley and Sivils (2018) identify, “humanity’s continued abuses against the land and its denizens, human and nonhuman alike, have spawned a culture obsessed with and fearful of a natural world both monstrous and monstrously wronged” (p. 11). The fear is not simply of what the natural world will do to human but also of what has been done to the natural world. This affective register is particularly evident in films that address the horror of melting icescapes, and of that which is no longer trapped within them breaking out of containment and infecting or attacking those who are proximal. Importantly, despite these recognitions of human harms upon the natural world, eco-horror has the capacity to reinforce an antagonistic relationship between humans and nonhumans. Viewing this from a posthuman framework, Tidwell (2018) writes that eco-horror

risks reinforcing those fears and the categories they are built upon, but ecohorror also asks us to reconsider some of those fears and to imagine what might happen if we were not to insist so vehemently upon such divisions. (p. 117)

The often-cited Gaia hypothesis by Lovelock (1972) is predicated upon the Earth as a self-regulating entity, one in which infection enacts a form of revenge against those causing destruction to ecological systems (pp. 579–580). These narratives align with those very same perceptions of microbial matter as a willful agent of harm, playing into anxieties of the present and deeply tied to the climate crisis. Here, the flaws of the human-centric outbreak narrative, and the ecologically motivated narrative of contemporary eco-horror align. Both narratives are predicated in some way on the struggle of human agency over natural threats, a form of battle or warfare that challenges notions of trans-corporeality and multispecies frameworks.

4 Anthrax and the Third Position

It may be pure coincidence that there is increased speculation that anthrax is emerging as a speculated environmental challenge for the future, while having a weaponized background in the context of US centric histories of terror. However, the anxieties that underpin both such historical and present realities of the anthrax bacterium reinforce narratives of fear and antagonism. Fourteen years following the finale of *The X-Files*, a 2016 event series saw the longstanding US television return to screens across the globe (Carter et al., 1993–2018). Important shifts occurred in this season, against the backdrop of a long-standing fictionalization of government conspiracy, monsters, and aliens. In Season 10, the myth-arc of the series (which was predicated on alien invasion) was abandoned – the warming globe no longer a suitable habitat for alien colonization. A central plotline in this season instead saw the two heroes, FBI agents Scully and Mulder, facing an earthly

⁴ Readings of the “first wave” of eco-horror, namely, the “nature-strikes-back” films of the 1970s, which include *Long Weekend*, identify their particular cultural emergence in the United States and Australia – two countries with difficult and ongoing structures of invasion, colonization, and Indigenous genocide.

threat: infection. Uncovering the “truth,” the agents reveal a plot that had seen US citizens infected with an alien virus, one which was set to bring down immune systems to wipe out humanity – a clean slate. As Scully explains, “Anthrax is the canary in the coal mine. It’s a harbinger of infections to come You are witnessing what might be the advent of a global contagion!” (Carter, 2016). Anthrax here is a useful shorthand for infection amidst frames of terror and human-engineered microbial agents – a key player in a narrative of conflict around power and shifting ecologies.

As mentioned earlier, the use of anthrax as a weapon violates the Biological Weapons Convention, a treaty many consider as having established strong global norms against the use of bacteria and viruses in conflict. The deployment of anthrax as a weapon in 2001 was an abhorrent attack, not solely because they targeted political figures, but through their threats to the US postal system and its workers. This event in 2001 was seen as a breach of morality, or the rules of engagement for conflict. What then, for anthrax that emerges as a result of a warming climate? Foundational French philosopher Michel Serres argued in 1990s that a warming, changing climate necessitates a reconsideration of human/ecological relationships. Essentially, Serres (1995) argues that the same social contract that governs human relationships (which he at times terms a pact) requires an extension to, or the inclusion of, the natural world as a necessity amidst changing human/ecological relationships and climate crisis. The earth, the world, the environment, should not be read as a backdrop for the social contract to play out, and he argues, rather, this contract should be inclusive of the natural world as a partner. Returning to the idea of rules of engagement, particularly as they relate to the use of biological weapons, the natural world is not currently a party to this agreement. Including the natural world in this moratorium on the use of biological agents such as anthrax would require willing engagements by human actants in a mutual respect of life that extends beyond the human.

While this sphere is rather speculative, Serres presents a thought experiment to explicate the necessity of a natural contract, one which has direct correlations with the emergence of anthrax from melting layers of permafrost. He takes the 1820 oil painting *Fight with Cudgels* by Francisco Goya as its focus. This painting, with muted layers of brown, depicts two men in conflict, upon a muddy surface, knee deep in the earth. Serres (1995) writes:

With every move they make, a slimy hole swallows them up, so that they are gradually burying themselves together. How quickly depends on how aggressive they are: the more heated the struggle, the more violent their movements become and the faster they sink in. The belligerents don’t notice the abyss they’re rushing into ... Who will die? we ask. Who will win? ... Let’s make a wager. You put your stakes on the right; we’ve bet on the left. The fight’s outcome is in doubt simply because there are two combatants, and once one of them wins there will be no more uncertainty. But we can identify a third position, outside their squabble: the marsh into which the struggle is sinking. (p. 1)

There is a direct and pointed correlation here between Goya’s mud in Serres’ hands, and the melting permafrost, the instability of the once-solid surface giving way to reveal the human bodies preserved within, and giving way to further violence. The third position – not the human struggle taking place across the surface, a battle of two nation states for the right to occupy land – but the land itself. If the land is treated as mere backdrop, the battle taking place is no longer consequential. What plays out in the war of the two brandishing their cudgels upon an unstable and melting surface is a strange suicide pact. As human conflict (read as human to human conflict, but also inclusive of ecological harms such as extraction or overconsumption) plays out, the earth subsumes those who act without recognition of its agency.

Philosopher of technology Bratton (2022), working toward his concept of the “revenge of the real,” holds as a matter of principle that “to advance a scientific biological conception of life is not to reduce the world to mere facts, but to recognize its complexity and fragility, and therefore that it also can’t be reduced to the constructed meanings we might project upon it” (p. 3). Writing amidst the COVID-19 pandemic, Bratton (2022) positions the pandemic itself as “a non-negotiable reality that upends comfortable illusions, no matter how hard some may try to push back with their chosen form of magic” (p. 3). One of these forms of the real is in terms of our relationship to microbial matter, revealed in relation to anthrax. As explored, anthrax is a bacterium laden with history, metaphor, and cultural baggage. However, notions of revenge, conflict, terror, or hijacking as read into human/microbial relations throws up a myriad of concerns. Perhaps it is the case that, in the words of philosopher Stengers (2000), the Earth “doesn’t care about the questions we ask about it. What

we call a catastrophe will be, for it, a contingency. Microbes will survive, as well as insects, whatever we let loose” (p. 144). The future for human/anthrax relationships, however, entangled with or divorced from these perspectives, appears no clearer or less dangerous than those of the past.

Anthrax is rendered often as a fiction, as are many elements of the environment, with particular forms of agency or willfulness in the narratives that are told about relationships between humans and the world. Rejecting the clean, hermetic ideal of containment as understood in relationship to the outbreak narrative, other possible avenues appear. As feminist and New Materialist scholar Alaimo (2010) writes, trans-corporeality presents as the “the literal contact zone between human corporeality and more-than-human nature ... in which the human is always intermeshed with the more-than-human world” (p. 2). This intermeshing is one that might be rendered with fear and anxiety, particularly in a contemporary world defined by contagion. Indeed, Alaimo (2010) acknowledges that the “the sense of being permeable to harmful substances” that arises with the identification of trans-corporeality “may provoke denial, delusions of transcendence, or the desire for a magical fix” (p. 146). However, as the permafrost melts, as fears and anxieties seep into the narratives we tell ourselves, as we become subsumed into the muddy ground below, rejecting the containment of the outbreak narrative exposes the potential for thinking microbial relationships in far expanded manners. Against a more traditional background, which sees the microbe as hijacker, willful agent of destruction, challenge to safety or boundedness, the trans-corporeal approach might illuminate alternative paths for future microbial encounters.

5 Conclusion

Recent histories of anthrax, deployed as a bioweapon and an agent of terror in 2001, have seen anthrax present specifically in serialized television as a marker of harm. Two decades later, the threat of anthrax has shifted in light of the environmental realities of a warming planet. The threat of anthrax has instead transformed into an activated harm emerging from once-stable layers of permafrost. The narratives told around microbial harm necessitate new ways of thinking about human–ecological and human–microbial relationships. Across eco-horror, and through theoretical frameworks, anxieties about unseen agents and culpability in relation to climate crisis, containment, and the traditional outbreak narrative is rethought. In this manner, conflict once read as purely political infuses a third position, one in which the natural world forms part of complex relationships, changed and altered by a heating globe. If contagion as it relates to anthrax is viewed as a window, what is seen are traces read into narratives of eco-horror in cinema, reflected in the very real reports of reawakened threats to human bodies across news media. In reflecting upon Wald’s framework of the outbreak narrative and the more experimental and diffuse hijacker model outlined by Landecker, the contemporary condition of anthrax is illuminated as shifting and complex, embedded both in landscapes transformed in real time, and the stories told about human–ecological interactions. Doing so opens up space for thinking beyond the possibility, or realities, of containment, and underscoring the criticality of ecological thinking across media, theory, and destabilized contemporary conditions.

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