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Religion, Animals, and the Theological Anthropology of Microbes in the Pandemicene

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Abstract: Microbiology's ecological turn, as it shifts its gaze from the individual microbe to the entanglement and ubiquity of microbial life, is transforming conceptions of human nature and disease in the sciences and humanities. Both the fields of Christian theological anthropology and medical anthropology are tuning in to these microbiological shifts for their reformative possibilities. Meanwhile, practical resistance to these shifts in recent pandemic responses suggest that forces greater than just the "pure science" of microbiology are informing attachments to hyper-modern or Pasteurian epidemiologies and radically independent, buffered views of the self. This essay explores the roots of such resistance. It investigates the interplay of shifts in theological anthropology and disease theories. Cultural anthropology and critical studies offer accounts of epidemiology's fraught relationship to a history of colonialism, racialization, and vilification of pathogens and pathogenized humans. This essay adds a theological analysis of the historical entanglement of perspectives on disease and Christian doctrine, which bears on the present pandemic response. It illuminates the ways some Christians "benefit" from germ theory's influence. Germ theory interrupts key Christian doctrine (especially theodicy) that makes Christian theology resistant to relational accounts of being human. Germ theory's theological reshaping of Christian teaching may also encourage the current resistance to more relational pandemic responses known as One Health strategies. While reformative and more realistic possibilities of emergent and entangled multispecies accounts of humanity's microbially are ample and apt, they must account for the ways in which microbiology has never been epidemiological without also being colonial *and* theological. In other words, this essay explores the smallest and most reviled "animals" in relationship to Christian conceptions of sin, contagion, and evil as groundwork for engaging humanity's micro-animality and diseases' relational aspects. To conclude, I offer four modest suggestions.



Citation: Al-Attas Bradford, Aminah. 2022. Religion, Animals, and the Theological Anthropology of Microbes in the Pandemicene. *Religions* 13: 1146. <https://doi.org/10.3390/rel13121146>

Academic Editors: Aaron Gross, Katharine Mershon and Joel B. Green

Received: 29 June 2022

Accepted: 18 November 2022

Published: 24 November 2022

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Keywords: religion; microbes; COVID-19; Pandemicene; Pasteur; germ theory; epidemiology; disease; animality; theological anthropology; human nature; microbiome emerging infectious disease; zoonosis; theodicy; Christian theology; one health; microbial turn; relational turn; colonial; microbiopolitics

1. Introduction

There was a time when the norm for microbiologists was to study isolated, homogeneous colonies of microbes pressed between a laboratory microscope slide or cultured in a sterile Petri dish, one species of microbe at a time. However, in recent decades, advances in genetic sequencing and bioinformatics have led to shifts in microbiology's subject. Painting with a broad brush, microbiology has gone from studying and demonizing individual, isolated single-species colonies (let us call that "Petri-dish microbiology") to observing entire diverse communities of organisms in their local environments or hosts, and the complex and often mutually beneficial interspecies relationships, including those comprising what is commonly known as the human microbiome (let us call that "ecological microbiology").¹ For many biologists, this shift from Petri dish to embedded ecologies has increasingly made the concept of individual, independent, species, and so too an individual organism (whether microbial or human) complicated, and in some cases even untenable, leading to

ripple effects in all manner of disciplines, including both the fields of Christian theological anthropology² and epidemiology.

In the case of Christian theology, humanity's microbial interdependence (what I call humanity's micro-animality³ or "microbiability") assists theologians seeking more relational/emergent/entangled ontologies of the human. In the case of epidemiology, this ecological, entangled orientation is also shifting epidemiological reasoning from a germ-centric paradigm of disease to more emergent and relational disease paradigms, where disease is understood to evolve through the relationship between pathogen, environment, and host.⁴ In other words, microbiology's ecological turn has led to a transformation in how both humans and disease are conceived. These theological and epidemiological shifts towards relationality are also ethically significant because of the ways modern conceptions of personhood and disease have funded racial and ecological violence, if not also the other way around. On the face of it, interdisciplinary attention to microbiological ecologies seems like a win.

However, recent pandemic responses reveal patterns of practical resistance to these purportedly helpful theoretical shifts. This essay presents two seemingly unrelated dilemmas of resistance to microbial reform (one theological, one epidemiological) and links them to a little-explored root: namely, the ways in which the vilification of vectoring animals and pathogenic microorganisms are bound up with an historical entanglement of colonialism, epidemiology, and aspects of Christian theology, especially theodicy. (Theodicy is the attempt to square belief in an omnipotent, benevolent divinity with the experience of suffering and death.) Ultimately, I suggest that modern germ theory scrambles longstanding Christian theological solutions to the "problem of pain" by offering a palatable scapegoat in the figure of the germ, making microbes the creatures Christians need to vilify.⁵

The essay begins by tracing microbiology's recent movement away from a Pasteurian and bounded framework for organizing life towards a multispecies, porous, emergent one. After exploring the reformative promise of microbiology's ecological turn for the fields of theology and epidemiology, it presents incidences of on-the-ground resistance to these reforms in the context of recent pandemic responses and the seeming indispensability of framing germs as the agents of disease in both fields. Next, the essay draws together theological and historical accounts that portray an intimate relationship between the theological anthropology of germ theory, ecological apathy, and colonialism. Finally, it investigates ancient Christian theology to suggest that germ theories have interrupted a 2000-year strategy for addressing the problem of pain and death (theodicy) for Christians in a way that "benefits" some Christians even at great cost to the environment, public health initiatives, and to those humans and animals cast as pathogenic. The essay concludes with brief suggestions that speak to a lack of social scientific and theological attentiveness to the impact of microbiology's inception (and its later ecological turn) on religious traditions and of religious influence on microbial perspectives.

To put this essay in context, my own early turn to the microbe was rooted in the hope that the science of the microbiome could reform North American Christian beliefs about human nature and address destructive views of beyond-human life. However, I now suspect that emergent and symbiotic, multispecies understandings of the self will make little reformative headway until Christian theologies acknowledge germ theory and modern theology's synergistic co-production of a colonial self that benefits from atomistic, buffered ontologies. We must look at the broad movements of how germ theory has been deployed in ways that fund ecological irresponsibility and racial oppression through supporting a theological anthropology of the atomistic, buffered, extractable, self, and we must look at how these further solidified through germ theory's historical entanglement with Christian theodicy.

In all of this, given the novelty of the field of microbial theology, my broadest aim as a theologian by training, who works in an applied ecology research lab, is to demonstrate both how productive the consideration of the interplay of religion and micro-animals or

microbes can be, and to highlight some key theological loci that beg scholarly attention when considering issues in religion, micro-animals, disease, and pandemic response.

2. Shifts in Microbiology: From Petri Dish Extractions to Ecological Embeddings

One might say that microbiology⁶ began as a project of extraction, identification, and isolation. In 1676, amateur Dutch microscopist Antonie van Leeuwenhoek, the first to observe bacteria, did so by extracting what he called “little animalcules” from their habitats—pond, rain, and well water; from inside his own cheek; and from human intestines (Letter to the Royal Society, 9 October 1676). Almost 200 years later, Louis Pasteur’s 1857 demonstrations that microbes were the agents of fermentation, and especially his 1860’s experiments identifying microbes as the agents of disease, marked a clear emergence of the field of microbiology.

In the same labs where microbiology was becoming established, the developing technology of Petri dishes and agar enabled microbiologists to culture individual homogenous colonies of microbes in a sterile environment apart from their ecological webs, establishing the individual microbe, most often classified as “the germ”, as the basic unit of microbiology.⁷ In this sense, microbiology and germ theory developed in an undifferentiated tandem. Discovery of the link between microbial life and human illness seemingly induced cultural amnesia about Pasteur’s parallel discovery that microbes contributed to fermentation and culturing that had been practiced as a means of food production and preservation for millennia. We might now conceive of pathogens through anthropologist Mary Douglas’ framework as “matter out of place”; a “germ” is a microbe that is not where it is supposed to be.⁸ However, for most of the history of microbiology, the places for microbes seemed rather scant, so much so that pathogenicity was seemingly inherent or proper to all microorganisms.

As Pasteur proposed his bacteriological causes of disease, the emergence of an “antiseptic conscious America” was already well on its way, and fantasies of a germ-free or “gnotobiotic” world grew right alongside bacteriology’s science of the germ (Waller 2002, p. 10). Pasteur’s research led to policies that to this day require that milk sold in U.S. groceries be pasteurized (heated to the point that all biological life is killed). Historians of science tell us, “By the 1960s germ-free life had long featured in the Anglo-American imagination . . . ” (Kirk 2012), iconicized in the gnotobiotic ideations of James Reyniers (1908–1967) and his colleagues who, spending their careers bioengineering germ-free technology with hopes of germ-free creatures and worlds, believed there truly was no place for microbes. All microbes were rendered as germs.

Although not universally so, microbiology and especially medical microbiology developed quite apart from neighboring biological disciplines such as zoology or cellular biology that could have nuanced the monolithic concept of microbe-as-pathogen. Molecular biologist Joshua Lederberg notes, “During the early acme of microbe hunting, from about 1880 to 1940 . . . medical microbiology had a life of its own, but it was almost totally divorced from general biological studies” (Lederberg 2000, pp. 287–93, 288). He explains that bacteriology remained mostly unaware of “conceptual revolutions in genetic and evolutionary theory” (Lederberg 2000, p. 288). Without attentiveness to the ecological and evolutionary dynamics, much less the benefits of microbial life, it is not hard to imagine why the field’s general approach was once of extraction and eradication.⁹

Gnotobiotics (the science of studying microbe-free animals)¹⁰ altered the face of medical and biological study, spurring a cultural phenomenon centered on an obsession with eliminating microorganisms from the human experience, with extremes leading to “germophobia” and to the technologies that gave us “isolator births”, where suspected immunocompromised fetuses were birthed as germ-free humans (Kirk 2012). From the earliest isolations of van Leeuwenhoek’s cheek animalcules and Pasteur’s Petri dish cultures to these increasingly debunked gnotobiotic extremes,¹¹ microbiology’s story was always bound up with cultural notions of threat, extraction, isolation, and purity. That was then.

Over the past two decades, in the wake of microbiology's ecological turn, the Petri dish has become just one of many tools. Stemming from a growing focus on ecological and environmental biology, development in high-throughput technology and metagenomic sequencing enables scientists to study not just individual microbes and monocultures of single-species colonies, but entire communities of diverse microbial colonies within their own relational habitats, whether it be the floor of a forest or the floor of human intestines. Metagenomic sequencing, which gives a genetic snapshot of all of the microbes in a collected sample, reveals interspecies intimacies are everywhere.¹² Counter to previous scientific thought, the overwhelming majority of microbial life has not and cannot (yet) be cultured in the lab. Still, that does not mean we have not been swimming in microbial life all along. Now, with increasing acknowledgment of the ubiquity of microbes, thoughts of conquering or eradicating microbes are giving way. Even in this pandemic moment, epidemiologists acknowledge that it is time to learn to live with microbes (Sariola and Gilbert 2020; Greenhough 2012). Microbiological understanding is being revolutionized (Berg et al. 2020). As microbiology's focus shifts from isolated microbes to microbial ecologies, biologists increasingly acknowledge,

... there has been a fundamental paradigm shift in our understanding of microorganisms and it is now accepted that all eukaryotes [organisms with nuclei, including all multicellular organisms] are meta-organisms and must be considered together with their microbiota as an inseparable functional unit. (ibid.)

These foundationally reorienting claims, that almost all organisms are dynamic, multi-species amalgamations, have led biologists to acknowledge that "significant interactions of animals and plants with symbiotic microorganisms ... disrupt the boundaries that heretofore had characterized the biological individual ... lead [ing] us into directions that transcend the self/nonself, subject/object dichotomies ... " (Gilbert et al. 2012).

As the physical, physiological, and even genetic boundaries between our human selves and our microbial symbionts disintegrate, scientists cannot quite designate where the human—or any animal, for that matter—ends and "the environment" begins.¹³ The interdependence is too thick. Humans cannot sleep, digest, defend, think, or even love well without microbiological contributions—disabusing us of modern, gnotobiotic fantasies. Furthermore, metagenomics reveals the extent to which the human genome is anything but purely human, with fragments of retrovirus composing our genetic makeup (see Boeke and Stoye 1997; Khodosevich et al. 2002). Still more, not only are microbes necessary for human flourishing, considering that microbes coevolved with humanity in ways that trained the human immune system to function as we understand it today, microbes in some senses are, as environmental geographer Jaime Lorimer puts it, what make us human (Lorimer 2018).

Moreover, these microorganisms, which contribute to our own being, are not exactly "beings" in themselves; the ubiquity of symbiosis not only challenges the notion of *individual* being, but being itself. As philosophers of science put it, microbial entanglement not only poses "severe problems for our traditional understanding of biological individuality but has also led some to claim that we need to switch to a process ontology to be able adequately [*sic*] to understand biological systems" (Dupré and Guttinger 2016). They explain, "What had seemed to be intrinsically stable entities have turned out to be systems stabilised only by the interactions between a complex set of underlying processes" (Dupré and Guttinger 2016). Microbiology's ecological turn has spurred a corresponding one in human ontology and in ontology more generally. Theorists are exchanging the language of human *individuals* for evolutionary biologist Lynn Margulis' language of *holobionts*, meaning human persons are a diverse and always emerging collection (or process) of lives, human plus all of their microbial symbionts, known technically as microbiota (Margulis 1991). In other words, individual organisms and genetic purity are somewhat mythological. There is no I, no thou—only a dynamic meta multi-species, We.

Finally, for better and for worse, human biology is changeable at the genetic level, and not only because of retroviral pieces, which permeate the human genome, but also because human biologies are biopolitically situated or contingent. If biology and culture

are, to use Karen Barad's word, "intra-active", this means that how societies think about the microbial actually changes the microbial, a stance fundamental to the multispecies turn. For example, in conversation with anthropologist Tim Ingold, Eben Kirksey proposes "that species emerge with becomings of animate beings who are entangled in ecological, political, and economic networks" (Kirksey 2015; See also: Kirksey and Helmreich 2010).

If what it means to be healthy and human no longer endorses being purely human and rather requires a delicate and dynamic balance of environmental entanglement where identity diffuses amid multispecies selves, this has ramifications both for theological anthropology and epidemiology, both of which previously operated within a fairly strict animal–human binary. Below, I present some key implications of each field's microbial turns before exploring possible theological genealogies of real and anticipated resistance to the hopeful microbial reforms. First, I look at the hopeful impact of the microbiological shift on theological anthropology, and then on epidemiology.

3. The Promise and Challenge of the Microbial Turn in Theological Anthropology (From Individual Ontologies to Multi-Species Relationalities)

Only in the past five to seven years have theologians and scholars of religious studies begun to turn to the microbe when considering what it means to be human in a divine economy, another way of describing theological anthropology.¹⁴ In what is still a small field that I call "holobiont theology", scholars typically turn to the microbe as an aid for dismantling Christian anthropocentrism and exceptionalism on the one hand and bolstering more relational approaches to theology on the other—two sides of the same more ecologically sensitive anthropological coin. Both moves seem promising.

On one side of the coin, humanity's utter microbial dependence disrupts Christian theology's primary and ancient anthropological trope of humans as the *imago dei* or "image of God". Deriving from the Genesis creation story, and in both Jewish and Christian traditions, the concept of humans being the "image of God" suggests that humanity shares some exceptional resemblance to the divine, thus grounding the possibility of relationship or intimate connection between divine and human realms.¹⁵ Eco-theological critics often cite the *imago dei* as the primary psychological wedge between humanity and its responsibility to animal and environmental life. This is because the *imago dei* is repeatedly held up as that which distinguishes human animals from all other animals—the *imago dei* can be crassly defined as any capacity humans possess that animals do not.¹⁶ The *imago dei* sometimes winnows down theological anthropology to the human without animality. Theologians sometimes use this type of deployment of the *imago dei* as a hallmark of classic theological anthropology. Veli-Matti Kärkkäinen notes:

A defining feature of traditional theology was to make a fairly categorical distinction between "nature" (creation at large) and human person as a creature. Indeed, traditionally Christian theology used to consider the transition from the discussion of nature to humanity as a disjuncture with the intention to underscore the importance of the difference between humanity and the rest of creation. (Kärkkäinen 2021, p. 11)

This hierarchical, exceptionalist, and environmentally agnostic use of the doctrine *imago dei*, which runs on human/nature, spirit/matter, and human/animal binaries, also provides one of the colonial logics of racial hierarchy. Womanist theologian Shawn Copeland's *Enfleshing Freedom* contextualizes Western theological anthropology within a presumed context of empire, showing how colonial Europeans extended a highly individualized, spiritualized, de-animalized theological anthropology to privilege and elevate pale "white" bodies over darker "black" ones. In other words, the logic of *imago dei* has been used both to denigrate animal bodies and animalize and racialize black ones (See Copeland 2010, chp. 1).

Meanwhile, microbiome science demonstrates that the very capacities some theologians define as the *imago dei* and use to separate, elevate, and save humans from "bestial" existence—whether reason, free-will, intellect, or religious affection—are possible only

by the donation of neurotransmitters from the trillions of our microbial inhabitants. Humanity's microbial symbionts are increasingly understood to be intimately bound up with humans' abilities to think and love well.¹⁷ If "man" sits at the center of God's economy, microbiology's ecological turn suggests microbes are there, too. In acknowledging humanity's micro-animality, the image of God becomes microbial, anthropocentrism wanes, and human exceptionalism as it has been traditionally narrated loses some credence. It is hard to maintain anthropocentrism when microbes or micro-animals are at the center of the *anthropos*, when their integral contributions are kicking the legs out from under the human-animal binary and human exceptionalism previously propped up by *imago dei* logic. Microbiome science and human microbiality bring humanity down a couple notches. This anthropological decentering of the human as the exclusive *imago dei* is but one aspect of a microbially informed and thus ecologically attentive theological anthropology.¹⁸

On the other side of the coin, relational theologians are also turning to holobiont frameworks to disrupt a modern theological picture of the self as autonomous, individual, atomistic, and isolated, what Charles Taylor has called "the buffered self" and what I call "Petri-dish personhood". If more ecological thinkers challenged microbiologists to think beyond the lab and Petri dish,¹⁹ more ecological theologians are challenging their field to think beyond Petri dish conceptions of the self. In many ways, modern Euro-Western theology's definition of the human self has walked in lockstep with Taylor's description of the modern person, imposing meaning onto the world from a separated and protected impermeable boundary of the self. Take for example the theological anthropology of twentieth century Swiss theologian, Karl Barth, who defining humanity apart from the rest of the cosmos defends himself with justifications that "both the older and the younger theologians were really interested in . . . a view of man rather than a view of the world as a whole" (Barth 1960b, p. 6) Barth mentions Alexander von Oettingen, who "deals ontologically only with man", and insists, "In this respect we may confidently refer to the overwhelming consensus of dogmatic tradition," explaining that in the end, theologians' hands are tied not only by this tradition but also the fact that the biblical text does "not contain any account of the cosmos . . ." (ibid., p. 6). Modern theology's subject has largely been the individual human, extracted from the rest of the cosmos, an isolated and pure specimen stuck in sterile Cartesian agar.

Given the ecotheological concerns raised by figures like Lynn White (White 1967) in the 1960s and Pope Francis today (Francis 2016), both of whom highlight the ecological threat of such atomistic views of the human, many theologians have turned to a more relational picture of the self. John Zizioulas, proposing relationality as more foundational than individual being, has helped turn theological anthropology towards defining the human in terms of personhood grounded not first in the individual self, but in community.²⁰ Arguing against the ailments of Western Cartesian conceptions of the self and capacity-based interpretations of the *imago dei*, Zizioulas insists the human is not

a complex of natural, psychological, or moral qualities that are in some sense 'possessed' by or 'contained' in the human *individuum* . . . [T]he person cannot be conceived in itself as a static entity, but only as it *relates to* . . . Personhood implies the 'openness of being', and . . . a movement towards communion which leads to a transcendence of the boundaries of the 'self' . . . ". (Zizioulas 1975)

Zizioulas develops his theology of personhood aware of the negative environmental consequences of Western anthropology, which were "beginning to worry theologians and simple Christians all over the world" (ibid., p. 406). He claims that when modern theology defines the human as an individual with special intellectual capacities "man has managed to isolate [extract] himself from creation, to which he naturally belongs, and having developed an indifference to the sensitivity and life of creation has reached the point of pollution and destroying it to an alarming degree" (ibid.). In other words, relational theologians like Zizioulas would tend to think that extractive, atomistic ontologies, like those of Karl Barth, breed ecological apathy.

The turn to humanity's microbiability as therapy for the ecological violence of a Euro-Western extractivist colonial anthropology, which has been disastrous to animal and environmental life, seems like an apt aid for relational theologians like Zizioulas. Classical Christian theology deals with humanity as if it dwelt in an ontological category that sits apart from the rest of the natural world, often putting "creation" in service to or as a mere backdrop for the primary theological story of the human–divine relationship, and framing animal nature as that from which humanity must flee as it becomes more divine. However, what so many theologians have thought apart, microbes bring together. After all, microbes can figure as tiny animals and are quasi-environmental.²¹ Microbes breach our epidermal and national boundaries, our encyclopedic and theological ones. How better to cure Christian isolationist and individualist anthropologies that extract the human from the environment and animality from the human than to highlight symbiotic microbiability? Holobiont anthropology and relational theology seem made for each other.

The Pandemic Pushback to a Microbial Turn in Theological Anthropology

While a microbially informed conception of personhood as holobiontic or microbial seems intuitively promising, instances of on-the-ground resistance to humanity's microbiability is observable in the religiously justified pandemic responses by a variety of Christian institutions, communities, and individuals.²² In March of 2020, Orthodox priest Stylianos Karpathiou maintained that Jesus's blood in the form of Eucharistic wine could not pass along the virus, as "Jesus Christ does not carry microbes" (Kampouris 2020). Whereas the Church universal's entire theological system rides on the claim that Jesus Christ was and is really, fully human, this priest's remarks display a microbiopolitical theology indicating that Jesus's personhood is radically buffered, purely human and anything but microbial. A resistance to the reforms of recent microbial shifts seems present. For this priest, microbes and humans cannot co-exist. Microbes in human spheres are matter out of place, and almost anti-Christological.

In the same month, the leader of Bulgaria's main Orthodox Church insisted that Bulgarian churches would continue to drink from a common eucharistic cup. He justified this practice by stating that the "The sacred mysteries [the wine] cannot be a vector of contagion or any disease, they are a cure for physical and mental healing and health" (Staff 2020). Here again the body of Christ, though claimed as fully human, does not seem to be able to be even adjacent to other-than-human life, and certainly not pathogenic life. While animals are commonly viewed as disease vectors, the bishop's statement seemingly precludes animal life from vectoring grace. Jesus's blood, which vectors life, trumps micro-animals, which vector death. In late November of 2020, the head of the Orthodox Church of Greece, Archbishop Ieronymos, was hospitalized with COVID-19. Meanwhile the church continued to serve the Eucharist via a common spoon, and this despite scientific reports that the virus spread through saliva (Taylor 2020). For Archbishop Ieronymos, like these other church leaders, Jesus and microbes do not mix. No entanglement. These high-ranking bishops' theological anthropologies indicate that Christ is naturally gnotobiotic, a description which for Christians becomes prescriptive when thinking about ideal human nature.²³

There are, of course, the more protestant iterations of pushback to a microbe-friendly, open, and relational view of human personhood in the form of anti-vaccination protests. During the COVID-19 pandemic, in the U.S. and across the globe, a subset of Christians claimed Jesus as their vaccine, citing the internal presence of either God's spirit or the blood of Jesus that thwarted the virus. In April of 2020, a woman in the U.S. leaving an Evangelical church gathering defended that she was not concerned about being infected or infecting others because she was "covered in Jesus' blood" (Cooper 2020). In late August of 2020, The Register-Herald of Beckley West Virginia published Steven Davis's opinion piece arguing that as long as Christians take communion, remembering that Jesus's death covered their sin, "Jesus is our coronavirus vaccine and mask" (Davis 2020). In August of 2021, Roger Dale Moon, pastor of Revelation Fire Ministries in South Carolina, released a

statement about not fearing COVID-19. His justification? “The blood of Jesus that covers me stops every kind of disease or virus that tries to enter my spirit, soul and body” (Husayn 2021). In this instance, being an upstanding Christian and being infected with microbial life are opposed. These responses reveal a gnotobiotic or antimicrobial or Pasteurian or germ-centric “microbiopolitical theology” antithetical to the microbially permeable realities of being human and holobiont.

As theologians such as Ziziouslas and others seeking to chip away at ecological apathy through more open, entangled, and relational ontologies of the self, these pandemic resistances suggest that microbiome and holobiont accounts of personhood are not as clear of a shot to relational ontologies as first meets the eye. Before exploring possible roots of such resistance to the reformative possibilities of microbiology’s ecological turn, it helps to now observe a parallel resistance in epidemiology.

4. The Promise and Challenge of the Microbial Turn in Epidemiology: From Individual Ontologies to Multi-Species Relationalities

These occasions of resistance to more relational, porous ways of understanding Jesus’s humanity and human personhood mirrors a practical pandemic resistance to epidemiology’s turn to emergent frameworks for disease. As with theological anthropology, medical anthropology is experiencing a more relational and emergent turn in response to microbiology’s ecologically informed advancements, which challenge or at least complicate the reign of germ theory. To briefly contextualize, in terms of time, germ theory is a blip on history’s epidemiological radar. Still, it is our Pasteurian blip. Prior to Pasteur, Galenic or humoral models of disease prevailed. Those pre-Pasteurian conceptions of disease attributed illness not to a microbe or a “bug”, but to an imbalanced, disharmonious relationship between the human, the environment, and even the divine. In a sense, the cause of disease was more ecological than ontological (Ferngren 2009, p. 18). Before the germ, disease was, in some senses, a negative change in the body. It was the event of being sick, a happening. More verb than noun, disease was not a thing in the world, but a collection of symptoms, the occurrence of runny bowels and runny noses, not streptococcus or MRSA. Canadian medical anthropologist Margaret Lock, borrowing from French microbiologist René Dubos (1901–1982), provides a useful binary for distinguishing between these epidemiological frameworks represented in the figures of Galen and Pasteur. For Galen, disease is more physiological, the event of unwelcome changes or symptoms. For Pasteur, disease is more ontological, an agent with substance.²⁴ Germ theory emphasizes the etiology of disease as ontological.

Louis Pasteur and Robert Koch’s nineteenth century identification of “discrete pathological entities” as agents of disease marked a radical shift from a millennia-old physiological framework to an ontological one. This transition ushered in with it what MIT’s Heather Paxson calls Pasteurian microbiopolitics or “the creation of categories of microscopic biological agents; the anthropocentric evaluation of such agents; and the elaboration of appropriate human behaviors vis-à-vis microorganisms engaged in infection, inoculation, and digestion” (Paxson 2008). This anthropocentric strategy for negotiating life with microbes was antibiotic, its main tactic being isolation and eradication of all microorganisms in or on the body. An ontological or Pasteurian framework of disease and a corresponding gnotobiotic or buffered view of the human is what most people reading this essay likely grew up presuming as given.

Recalling a time before the COVID-19 pandemic, Pasteur’s microbiopolitical influence ruled for over a century and is identifiable in the use of broad-spectrum antibiotics, pasteurization, regulation of dairy and food industries, and even in Christian eucharist feasts where Purell bottles can often be found sitting next to the bread and wine, signaling that all beyond-human life has been separated from the meal.²⁵ In one of the most sensory-rich rituals in Christian liturgical tradition, an antibiotic or Pasteurian anthropology suggests the Christian worshiper experiences safety and a certain theo-anthropological apotheosis when she communes with the life of God while antiseptically isolating from the rest of

creaturely life. Or to be plain in speech, in church, the less microbial, “germy”, or “dirty” the Christian is, the more human and the more ready to be with God, to be like, or to image God.

This liturgical microbiopolitics of anthropocentric isolation and eradication reveals the way notions of personhood and notions of disease have often paired. Concepts of disease and the human are co-productive. Theories of disease bear intimately on how humans perceive themselves and vice versa. Historians of disease theory acknowledge this less than scientific aspect of defining disease:

Disease is an elusive entity. It is not simply a less than optimum physiological state. The reality is obviously a good deal more complex; disease is at once a biological event, a generation-specific repertoire of verbal constructs . . . an occasion of and potential legitimation for public policy, an aspect of social role and individual—intrapsychic—identity, a sanction for cultural values . . . (Peitzman 1992, p. xiii)

This holds also for personhood. Furthermore, these elusive natures relate. In the Pasteurian dawn, it is fair to say that the transition to a distinct and definable enemy in the germ finally made possible a definable bounded self. How did germ theory complete the task of “buffering” the self? Ed Cohen, writing on immune theory development, explains:

Until the end of the nineteenth century the modern body does not exist, strictly speaking, as a biological body. Or to put it more accurately, at the end of the nineteenth century, the modern individual’s atomized body does not accord with prevailing scientific theories that apprehend living organisms as contiguous with their lifeworlds . . . only with the advent of biological immunity does a monadic modern body fully achieve its scientific and defensive apotheosis. (Cohen 2009, pp. 7–8)

In other words, while modern thought had crystallized around the idea of the human as radically separate from the rest of the mindless world, the cold, hard facts of embodiment as well as a more ecologically oriented scientific view of nature told a different story.²⁶ It was not until MacFarlane Burnet’s theory of biological immune defense, which developed alongside biological germ theory, that people were able to imagine their bodies as defendable and thus bufferable via the immune system, despite its porosity. The immune system, Burnet claimed, performed the essential work of identifying any non-human presence inside the body as a threat and attacking it. It was a task of discerning between self and non-self, both of which depended upon the idea of the human as separate from everything else, even as it made such isolation possible (Burnet 2013). Thus, even as microbes materially challenged notions of the buffered self, the story we told ourselves about defense against microbes nurtured notions of buffered security. The microbe was the problem, but proving human ability to solve it became indispensable to securing our modern sense of humanity.²⁷

This mastery over infection and antibiotic buffering of the self is what any number of medical historians bemoan as that which sent epidemiology into a reductive mode where, in the words of Charles-Edward Amory Winslow, “the practical triumphs of bacteriology did indeed tend to over-simplify the problem and to cause medical men for nearly half a century to ignore the true many-sidedness of disease” (Anderson 2004, p. 49). This triumphant sense of mastery through vaccination and antibiotics reached a sort of pinnacle in the establishment of zoonotic understandings of disease. Zoonotic diseases transmit between species of animals, including human ones. Rabies, Lyme disease, and COVID-19 are zoonotic. The arrival of zoonotic conceptions of disease in the twentieth century made disease vectors visible, vibrant, and therefore vulnerable.²⁸ If subvisible germs were more manageable than invisible miasmatic threats, animals as disease vectors only increased the visibility and thus controllability of disease. Readers might recall those grade-school diagrams where a pathogen cycles from flea to rat to human. Medical anthropologist Christos Lynteris argues that the simplicity of these diagrams accomplishes two interrelated

tasks, epidemiological and anthropological in nature. In the first place, the zoonotic diagram “renders human infection predictable and, as a result, preventable. . . .” (Lynteris 2019, p. 51). Even to a novice, the corresponding public health strategy seems obvious: find the animal source or “reservoir” and eradicate it. Killing the animal kills the disease. Within less than a decade of the acceptance of zoonotic disease frameworks, all manner of campaigns to eradicate animal carriers ensued.²⁹ Lynteris explains that “The net effect was that by the mid-1920s the rat had been transformed from a mere nuisance to a charismatic epidemiological foe” (ibid.). The public health message was clear and simple: “No rats, No plague” (ibid.).

The crystallization of an epidemiological villain in the animal offered more than just epidemiological value. It provided anthropological value. Zoonotic reasoning made control and mastery of animals integral to being human. Lynteris argues that villainizing the animal spurred new conceptions of the human position in relation to plagues, a relation made visible through diagrams of zoonotic cycles.

Zoonotic diagrams position humanity for the modern progressive notion of liberation from zoonotic plagues, in Lynteris’ words, a “breaking of chains, a separation, and at the same time unshackling, of humans from animals” (ibid., p. 53) The diagrams are part of what Ed Cohen is pointing to in describing germ theory (along with immune and zoonotic theory) as the final step in closing off the human from the world. For, as Lynteris points out, “at the heart of every Disease Diagram lie, as its organizing principle, not simply ideas about animals, spaces, or pathogens but, most importantly, ideas about humanity’s *relation to the nonhuman world*” (ibid., pp. 53–54). Lynteris defines this relation as “a project of mastery”, which by the 1940s “is no longer simply ethical by means of disciplinary regimes of ‘de-animalization’” (an ethical project that maps quite easily onto Christian salvation narratives wherein sanctification entails the shedding of human animality) (see Gross 2014; Meyer 2018). Rather, zoonotic diagram imaginaries meant it was no longer the animal within the human (whether in the form of a micro-animal or in the form of human animality) that threatened humanity but the animal beyond, such that “the human project depended on physical separation and distancing from nonhuman animals” (Lynteris 2019, p. 54). In a nutshell, disease management was an epidemiological project that also served an isolationist and colonial anthropology of mastery of self and others. Isolate humans from animals and germs; eradicate the latter to become the former. So it went for well over a century.³⁰

4.1. The Emergence of Emergent Disease

In the late 1980s and early 1990s, public health models began to move beyond the language of germ-based infectious disease to “emerging infectious diseases”. (EIDS) EIDS are “Diseases that have newly appeared in a population or have existed but are rapidly increasing in incidence or geographic range” (Haider et al. 2020). Emergent epidemiology acknowledges that pathogens coevolved with their hosts over millions of years, reaching a relative equilibrium between host and inhabitant. Perhaps more like the previous Galenic theories, emergent epidemiology is more about the fragile connections in an ecology of interspecies relationships. With today’s disruption of delicate ecological balances and the capitalist globalized economy, which exploits and interrupts intimacies of entanglement, new diseases increasingly and now exponentially are emerging (see Sell and Williams 2020; Yong 2022; Cohen 2009). As public health experts quip, “Shake a tree, and things fall” (Lynteris 2019, p. 56). Press too hard and Earth mounts an immune response against humanity.³¹

Where Petri dish ontologies of the human and zoonotic diagrams lead to a sense of human mastery and to epidemiological impulses to blame, isolate, and eradicate,³² emergent disease frameworks have alternatively led to a “One Health model”, wherein disease of one is understood as disease of all.³³ One Health frameworks, which formally emerged in response to the SARS epidemic, acknowledge the utter porosity of nation state borders, ecosystems, and bodies and also that humans bear the most responsibility for the

emergence of new diseases, including “changes in ecosystems and land use, intensification of agriculture, urbanisation, and international travel and trade” (Mackenzie and Jeggo 2019). The simple zoonotic cycle has become a complex web. The CDC defines the One Health model as

a collaborative, multisectoral, and transdisciplinary approach—working at the local, regional, national, and global levels—with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment.

With such attentiveness to the porosity and interconnected reality of places and peoples, disease management is more complex and requires high levels of global cooperation, as acknowledged by the world’s major public health institutions, including the WHO, FAO, OIE, UNICEF, and the World Bank. As with more emergent and relational theologies of personhood, ecological attunement is a key feature of emergent relational epidemiology and One Health strategies.

4.2. *The Pandemic Pushback to a Microbial Turn in Epidemiology*

Despite this globally acknowledged strategy, COVID-19 responses have often reverted to demonizing, isolating, and eradicating animals and “animalized humans” in the present effort to manage the novel coronavirus. Fairly early on in the pandemic, scholars began asking “why have lessons from animal disease studies been ignored?”, especially in light of the “ubiquitous” assent of One Health models (Enticott and Maye 2020). Lynteris himself laments, and this before COVID-19:

... in spite of the rhetoric of One Health and academic evocations of multispecies intimacies, the image and social life of non-human animals as epidemic villains is a constitutive part of modern epidemiology and public health as apparatuses of state and capitalist management. Whereas the above approaches (including microbiome studies, and ‘entanglement’ frameworks in medical anthropology) do contribute to a much-needed shift in the intellectual landscape as regards the impact of animals on human health, their practical and political limitations are revealed each time there is an actual epidemic crisis. Then, all talk of One Health, multispecies relationships and partnerships melts into thin air, and what is swiftly put in place, to protect humanity from zoonotic or vector-borne diseases, is an apparatus of culling, stamping out, disinfection, disinfestation, separation and eradication; what we may call the sovereign heart of public health in relation to animal-borne diseases. For the maintenance and operation of this militarised apparatus, the framing of specific animals as epidemic villains is ideologically and biopolitically indispensable, even when blame of the ‘villain’ in question lacks conclusive scientific evidence (Lynteris 2019, p. 1)

While both theological anthropology and epidemiology have attempted to reform their own paradigms through integrating the ecological shifts in microbiology, both face resistance. What if more than just biopolitically indispensable, the vilification of pathogens is also theologically indispensable? What if these uses relate to each other? Below, I offer a theological analysis of the historical entanglement of disease theory and Christian doctrine, showing how buffered theological pictures of the self rooted in human–animal binaries and human exceptionalism relate to antibiotic tactics that vilify pathogens, and also arguing that germ-centric frameworks are hard to shed in part because they interrupt and replace unpalatable Christian theodicies which hold humans responsible for their own sin, suffering, and death.³⁴ In what follows, I show only a sample of the ways theology and germ theory are co-produced and some of the “benefits” to such productions.

5. *Cui Bono? Colonial and Theological “Benefits” of Germ-Centric Epidemiology*

The resistances to microbial reform in theology and epidemiology do not just mirror each other, they are also historically related, albeit in admittedly messy fashion. On the

one hand, in theology, I have foregrounded resistance to a microbial/ecologically relational personhood that rejects atomistic separatist views of the self, like that seen in ecclesial pandemic demonizations of the germ. On the other, medical anthropologist Lynteris notes the vilification of the germ as part of what funds an anti-ecological, atomistic public health strategies during the pandemic. The linkages between these resistances to microbially informed ecological ontologies of humans and disease is visible in two distinct phenomena, which I explicate below. First, I show the reader how the buffered ontology of personhood secured through microbial vilification is also indispensable to the anti-Black and anti-environmental impulses of North American colonialism. Then, I explore how vilification of pathogens further offers psycho spiritual “benefits” to some Christians not only by distancing them from spiritual and ethical responsibility for human pain and suffering but also by feeding an ancient and colonial delusion of immortality through mastery over “the other”.

5.1. Colonial and Anti-Ecological “Benefits” of Buffered, Petri-Dish Personhood

A “buffered” and extractable theological anthropology, what I have been calling Petri-dish personhood, with its seemingly impenetrable boundary between the (primarily white) human and everything else, has been implicated not only in our broadest ecological crisis by figures such as Zizioulas, White, and Francis, but also in a history of anti-Black racial violence. Father of Black liberation theology, James Cone blamed ecological degradation and that of Black life on logics of instrumentalization, mastery, and domination, Euro-Western logics which depend upon the falsehood of humans as separable, extractable from everything else (Cone 2000). Theologian Willie James Jennings locates the origins of this kind of separatist picture of the human in the brutal colonial history of violent extraction of human life from land and animal. Jennings argues that the horror of extracting bodies trained white settlers to think of themselves as rational, private property owners, no longer identified through the land and interspecies relationships in which they lived, but by “property” possessed and mastered (Jennings 2018). He explains of the North American slave trade, “For the first time in human history, peoples especially in the colonized world would be forced to think of themselves in disorienting ways, to think of themselves away from land and away from animals into racial encasement, . . . ” (ibid., p. 31). In other words, from this perspective, the North American story of white supremacy and black enslavement helped institutionalize or en flesh the vision of the extractable self observed in modern Christian thought, making it a key step in the formation of white identity, and racialization.³⁵ For Jennings, the atomistic, buffered self that ecotheologians decry as environmentally devastating finds its genealogy in slave trade. Furthermore, as shown below, this early colonial story of personal alienation from land and animal in the extraction of black lives anticipates the later settler colonial embrace of germ theory and its Petri dish ontology, which only further facilitated instrumentalization of land and racialization of disease. It remains to be shown how colonial pictures of the extractable self and epidemiological pictures of the isolatable germ operated in a vicious cycle.

Historian Linda Nash, in *Inescapable Ecologies*, details a codependency between the rapid North American embrace of germ theory and a colonial atomistic idea of personhood, both of which emboldened racism and anti-environmentalism during Western colonization. Though some think of colonization as a unidirectional imposition, colonizers understood colonization reciprocally—land and body were vulnerable to each other’s fates, meaning that the exhaustive abuse of the land had health implications for inhabitants. Nash explains that while historians often focus on indigenous peoples’ succumbing to disease brought in by settlers, “The one-sided focus on the disease history of Indian peoples can have the effect of rewriting white bodies in contrasting and somewhat ahistorical terms—as clearly bounded, always resilient, and unproblematically cosmopolitan” (Nash 2006, p. 17). In reality, the late Victorian body’s porosity became a mental roadblock for would-be settlers, who were concerned not only about the “tropical diseases” of native peoples but also about the health risks of transforming the land too drastically. Porous bodies entangled with

the environment itself created conflict between what Nash describes as “settlers’ desire to rapidly transform the landscape for profit on the one hand and ecological understandings of health on the other”.³⁶ White settlers were worried about the drastic alterations to the landscape their settling entailed and how this would affect their own porous, permeable selves. Enter germ theory.

Hoping to speed white colonization of California’s Central Valley, developers used germ theory as an ideological scythe to sever the body–environment relationship. Jumping ahead of public health consensus, white land developers produced brochures promoting germ theory. As Nash explains, developers peddled the new epidemiological theory “to disconnect health from the landscape . . . In a culture committed to rapidly colonizing and radically transforming landscape . . . , germ theory became a tool to ‘individualize and further racialize disease’”.³⁷ Blessing environmentally unsound practices by de-linking the human from the environment reveals the connection between modern Christianity’s buffered self and the ecological apathy that Zizioulas and others bemoan. White Christian environmental apathy is no accident. Distinction between body and land was cultivated to grow such apathy.

Jennings raises the stakes further because ecological dislocation, disorientation, and eventual apathy are what he argues are the bedrock of racist greed and colonial enslavement of black people. “Because the land was being taken, the animals were captured and killed at a monstrous rate, and the plants and the landscape were being altered irreversibly,” white and black people were disciplined into thinking of themselves through racial lenses. If the conceivability of the self as independent and extractable from the environment was manifested through the horrors of chattel slavery, germ theory itself was yet another tool in the hands of North American colonial developers seeking to promote a sense of the white settler self as translocatable and distinguishable from local ecological fates.

Bringing Jennings’ account of white supremacy’s dependence on the buffered extractable self into conversation with Lynteris and Nash, “the germ” shaped to the white man’s needs becomes a link in the chain that dragged and enslaved the world to its colonial, capitalist form. Using “the germ” to ecologically detangle white humans for the sake of geographic manipulation framed land as meaningless and manipulatable and the body as racialized (Jennings 2018). Petri-dish personhood emerged through the colonial extraction of people and the germ doubled down on the same narration of separable selves. The germ was embraced to bless instrumentalization of land, further institutionalizing the extractability and mastery of black bodies forged in the Atlantic slave trade. The germ and its concomitant buffered human host were both socially extracted from a mill that ground together the powers of colonial desire, settler greed, pandemic pragmatism, and an autonomous individualism serving capitalist interest.³⁸ These entanglements are instructive as theologians and epidemiologists press towards more ecologically porous anthropologies. Using holobiont theology or humanity’s microbially to re-enmesh human and environmental fates for the sake of racial and ecological justice is a fool’s errand unless it begins by acknowledging that germ theory has never been epidemiological without also being colonial.

Furthermore, germ theory is also deeply entangled in a theological history that only thickens subterranean affections for a vilified germ and an enclosed self. For although microbiome science is new, and knowledge of microbes is only a few hundred years old, the theological story of microbes is only newly visible. Microbes have materially interacted with humanity throughout history, not only as they have been framed epidemiologically in the colonial history of the United States but also in historical interactions with humans in the microbial activities of disease, decay, and fermentation. These historical microbial interactions have been informing the religious imagination for as long as the category of “religion” has existed itself. Below, I show how the co-productive history of Christian theology and microbial activity makes dispensing with germ-centric epidemiologies all the more fraught.

5.2. Germ Theory Offers Pleasant Alternatives to Christian Theodicies

Christian Theodicies Exonerate God and Matter from Blame for Human Suffering

In the church's first centuries, a subset of Christians (we might call them gnostic-esque) strayed towards a bloated or overoptimistic view of human nature. In their appraisal, humans were naturally immortal and almost quasi-divine souls. This overestimation of human grandeur remained at odds with lived experiences of suffering. Late antique attempts to square this dissonance emerged in the form of pessimistic or low views of the material world, including the human body, and the demi-god who materialized creation, all views that today have come to define what we think of as the more gnostic sects of the early church. This squaring functioned as theodicy. Elevate human souls by blaming embodiment or matter itself for human suffering.

To defend matter and its divine creator, early Christian theologians including second-century Bishop Irenaeus of Lyons, and later other theologians like Athanasius (296–373) and Thomas Aquinas (1225–1274), developed a multifaceted doctrine of creation and of humanity's fall as a counter-theodicy.³⁹ First, Irenaeus reversed a view of humanity as naturally immortal. By insisting that humans and all creation was created from no pre-existing substrate or "from nothing" *ex nihilo*, Irenaeus reversed a gnostic-esque notion that human souls had been in existence for all eternity and were thus immortal (Irenaeus 2015, p. 1.22.1). For if creatures are created from nothing, they *naturally* return to nothing, and no one is to be blamed for human mortality. It is only natural. At the same time, according to Edenic accounts in Genesis, while human mortality was natural, human death was not divinely intended. Being mortal did not mean inevitable death. Despite humanity's mortality, humans should have been able to live indefinitely because of the graces afforded by God in Eden through the Tree of Life. In essence, eating from the Tree was like a deterioration inhibitor—indeinitely staving off death, as aptly explained by Aquinas, building on the writings of other theologians like Athanasius and Augustine.⁴⁰ However, Adam and Eve's ejection from the garden deprived them of the graces, of the divine medicine God used to keep mortal humans alive. Why were Adam and Eve expelled from the garden in the Genesis story? Because they believed the serpent's lie that they could be like God and live forever without God's support. They believed they were immortal.⁴¹

By these theologians' accounts, human suffering and death should not be blamed on mortal flesh or the God who creates material flesh, but on sinful humans who believed the serpentine lie that as immortals, they could live separate from Eden's graces.⁴² In short, delusions of immortality that led to humanity's fall are to blame for human death. As the late Christian ethicist Allen Verhey put it, "The fault that runs through our world is not God's fault—and . . . is not the fault of nature, either. The fault is ours. The fault may be traced to human sin . . ." (Verhey 2003, p. 167). Whereas gnostic-esque theodicies demonized matter, blaming matter and bodies for human pain and death, Irenaeus' fall-doctrine exonerates the cosmos and its creator while asking humanity to face their natural mortality and carry the weight of responsibility for their suffering and death. It is an uncomfortable doctrine, to say the least. By the Christian account, neither microbes nor disease are the ultimate reason why humans die; rather, it is human nature to die, and not even God's provision of a Tree of Life can spare humanity because of humanity's fall through Adam and Eve's sin. Christian theodicy exonerates God and matter but it is not wildly palatable.

Augustine of Hippo (354–430) further exonerated creation through what became another key component of classic Christian theodicy—the doctrine of evil-as-privative. Gnostic-esque theodicies blamed matter for the human soul's suffering. Such blame pinned real material things as agents of pain and death. In other words, they ontologized evil, made it a real creature. Building on Irenaeus, Augustine countered this by insisting "nothing evil exists in itself" (Augustine and Outler 1955, chp. 4). He insisted that evil is privative, meaning it has no being or existence. Evil is simply negative change to pre-existing entities. In short, early Christian counter-theodicy (1) affirmed the goodness of all parts of the cosmos and (2) denied the existence of evil creatures while (3) emphasizing human

responsibility for sin and therefore death and (4) highlighting humanity's natural mortality. In summary, Christian theodicy vindicates the cosmos and implicates humanity.

Remarkably, germ theory reverses the equation and metaphorically disrupts each of these four aspects of Christian theodicy, which I further explain below. It reverses a Christian doctrine of evil as privative. It externalizes sin. It nurtures delusions of human immortality. Already, then, the reader might be able to imagine the "loss" in letting go of microorganisms as universal enemies.

5.3. *The Symbolic Load of the Germ: Three Psycho Spiritual "Benefits"*

5.3.1. First, Germ Theory Reverses a Christian Doctrine of Evil as Privative

A predominant metaphor and analogy used to teach Christianity's doctrine of evil-as-privative or as non-existent evil-as-disease, and to a lesser degree, evil-as-decay. Theologians historically deployed the imagery of disease and decay because the science of the day held that these did not exist as material substances. Theologians called evil a disease to banish thoughts of evil being an existing creature. Take for instance Augustine, who used analogies of sickness and disease to explain evil's privative nature:

What, after all, is anything we call evil except the privation of good? In animal bodies, for instance, sickness and wounds are nothing but the privation of health. . . . For such evil is not a substance; the wound or the disease is a defect of the bodily substance which, as a substance, is good. (ibid., chp. 4.11)

Augustine deploys the givenness of disease's non-existence to explain evil's non-existence. For him and other theologians writing prior to Pasteur, disease and decay were neither microbial creatures nor agents. Disease and decay were just words used to describe negative changes to the world; beer souring, fresh pita molding, a babe's temperature rising. In the late ancient mind, disease and decay were real events, but not real things—and evil worked the same way. It was a perfect metaphor. Theologians like Augustine called evil a disease exactly because there was no creature, no critter associated with disease. Except, now there is.

With the dawn of germ theory, conceptions of disease shifted from being associated with non-substantial events to substantial creatures.⁴³ The significance of Pasteur's attribution of disease to microorganisms was not primarily that microbes were the agents responsible for disease but that there were agents responsible for disease *at all*. The nature of disease changed from being ecological to ontological, from event to thing, or perhaps from having a processual etiology to an ontological one. Problematically, theologians did not change the metaphor. Augustine's doctrine of evil was meant to affirm creation's goodness and evil's nonexistence. Germ-based disease metaphors almost immediately did the opposite, as evident in an association between disease, germs, and evil that appears in nineteenth century public health literature, as well as in antiseptic advertisements. Scott's Emulsion of Cod-Liver Oil described bacteria as a "little germ, or wizard, or demon" (Barlament 2005, p. 23) and Perry Davis' Pain-Killer described bacteria as "demons of disease", which "attack, afflict, and kill men, women, and children who might otherwise live long lives" (ibid.). Examples from this period abound. Even if only metaphorically, germ theory legitimized the demonization of creatures both because it interrupted the privation metaphor meant to inhibit vilification of any creature and all the more because now the metaphor actually primes or accustoms people to thinking of some creatures as vilifiable. The common metaphor of "the disease of evil" naturalizes the idea, at least for Christians, of "the evil of disease", that a microbe in the wrong place is evil.

Even today, the ease with which some Christians demonize the novel coronavirus is striking. In March of 2020, Rev. Dr. Bishop Frank J. Beard of the United Methodist Church (UMC) posted a letter on the website serving the entire region of the UMC enumerating seven spiritual weapons effective against the pandemic. At the time of this article's publication, the letter remains on the site:

I hope that this will prove helpful and will serve as an encouragement for Christians to realize the importance of spiritually engaging in the war against this deadly virus . . . Our World is under attack from a vicious enemy whose primary purpose is death. As Christians we understand that this thief comes only to steal, kill, and destroy (John 10:10). He is a powerful destroyer, but we are not rendered powerless against him or his vices.⁴⁴

In Bishop Beard's letter, microbes and the demonic elide. With the modern embrace of germ theory, the very doctrine and metaphor that was meant to shield creatures from vilification and othering not only no longer works, but it actually paves the way for such demonization and blame-shifting. Because of the metaphor of evil as disease, when germ theory made disease a creature, evil became one too, opening the door to the demonization and scapegoating of all sorts of matter, whether that of the microbe or even of black lives.⁴⁵ Germ theory's inadvertent enmeshment with Christian theodicy reopens the door to the theological idea that some creatures *are* evil, and at the same time paves the way for gnostic-esque blame-shifting. Counter to Irenaeus and Augustinian theodicy, which "solves" the problem of suffering and death by making humans partly responsible, germ theory holds out the possibility that Christians are not responsible for the reality of death after all—tiny invisible animals are. Through a seeming lexical glitch, Pasteurian bacteriology scrambles the message of the Christian doctrines of creation, fall, and evil.⁴⁶ It reverses the doctrine of evil as privative and paves the way for demonization of material creatures. The metaphor of evil as disease has outlasted its shelf life.

5.3.2. Second, Germ Theory Externalizes Human Sin

Furthermore, some Christians "benefit" from germ theory because it not only shifts responsibility for *suffering and death* onto vilified micro-animals, germ theory can also distance people theologically from responsibility for their *sin* or misdoings. This externalization and thus blame-shifting emerges from the exogenous nature of pathogenic disease. Here is how it works. Theologians have long written about the "disease or contagion of sin", using the metaphor to help Christians understand sin's endogenous pervasive nature. In a Galenic understanding of humoral disease, sin moved like disease. It was endogenous. It came from within and was pervasive. This epidemiological framework has long shaped Christian theology's primary metaphors for sin (Cronin 1995). For example, prior to Pasteur, French theologian John Calvin (1509–1564) used humoral understandings of disease to describe sin's pervasive effects " . . . corruption subsists not in one part only . . . none of the soul remains pure or untouched by that mortal disease" (Calvin 2011, p. 253). What was this mortal disease? Calvin taught that through Adam's fall, "a contagion imparted by him [Adam] resides *in* . . ." (ibid., p. 248 [emphasis mine]) every human. The disease of sin came from within; humans were born with it. Some readers might counter that inherited sin is not inherent or endogenous but rather passed from Adam and imposed onto all humanity, and was thus exogenous, like microbial pathogens. However, for theologians such as Calvin and Thomas Aquinas, the seeds or semen of sin were transmitted sexually and thus were inherently part of each human's nature. The original sin became native. As made plain by Aquinas, "Although the guilt is not actually in the semen, yet human nature is there virtually, accompanied by that guilt" (Calvin 2011, I-II, q. 81, art. 1). What is inherited (think genetic) is also inherent.⁴⁷ English Anglican cleric John Newton, writing in 1820 also described sin's internal and even intrinsic nature through disease imagery.

The worst of all diseases
Is light compared with sin;
On ev'ry part it seizes,
But rages most *within*;
'Tis palsy, plague, and fever,
And madness—all combined; . . . (Newton 1988, pp. 375–76. [emphasis mine])

As these theologians demonstrate, the disease of sin was internal, endogenous, and pervasive.

Germ theory disrupts these theological teachings. Where humoral disease was endogenous—originated inside, was human blood and bile gone bad—germs are exogenous, originating outside. With germ theory, disease switches registers, from native to foreign. As germ theory became more popular, preachers deployed not humoral but bacterial metaphors to reflect on sin. In the early twentieth century, a New York preacher described how “microbes of wickedness invade human nature and demoralize it” (Barlament 2005, p. 4). The Christian is no longer naturally sinful through Adam’s inheritance but a victim of microbial demoralization. Germ theory disrupts the theological metaphor of sin as an internal spiritual ailment and makes sin a threat “out there”.⁴⁸ Bruno Latour suggests something similar, noting how early Pasteurians eagerly turned to microbes to explain their sinful behavior, to explain why people “did the evil they didn’t want to do”, referencing Romans 7:19.⁴⁹ With the discovery of the germ, it was not a person’s evil nature or the sin living within that deranged human life (which is what the biblical text claims). It was the microbes pulling the strings all along.⁵⁰

The significance of germ theory’s disruption of Christian understandings of sin can be understood by analogy. Jonathan Harris, analyzing medieval political threat management strategies through biopolitical metaphors, notes how leaders have used external political threat to conceal domestic conflict (Harris 1998, p. 13). The strategy? Hide the mess inside by pointing to external problems. In modernity, such blame-shifting tactics work even better with germ theory. Germ-based diseases point not to the self but to an “other” that should be outside but has gotten in. When likened to management of pathogens, management of political threat necessitates differentiation, fortified borders, vigilance, self-defense. Harris observes that the emerging field of microbiology gave theories of internal social pathology a “boost” as germ theory supplied “the metaphorical template for the exogenous paradigms of social pathology”.⁵¹ Germ theory, he explains, “. . . made it difficult to figure social ills other than as invasive foreign bodies” (ibid.). The same is true in reverse. Germ theory made it hard to frame social illness as internal. As endogenous theories of disease waned, so did the language to describe internal social ills. Harris notes that when Thomas Hobbes wrote the *Leviathan*, he struggled to describe “the commonwealth’s ‘internal disease’, without “a live humoral vocabulary . . . ”⁵². When disease theories mutate, disease-based metaphors may fail to function as they previously did.

By this logic, then, the question remains whether germ theory has the potential to create the same problems for religious disease as it has for social disease. While social scientific research is required to better understand whether Christians manage anxieties about personal spiritual pathology the way medieval political leaders managed their political vulnerabilities, this essay raises the question of whether germ theory has made it harder for Christians to think about personal moral failure. With language less available with which to think of internal spiritual ailments, Christians may be predisposed to blame others for what Christian teaching would call their own sin-sickness. Raised to believe the wage of human sin is death, learning that death comes by the germ might bring great relief. Unlike humoralism and unlike Christian theodicy, germ theory makes the microbe the agent of physical disease and death, not the human or her body, leaving the Christian, as with Hobbes, less effective metaphors to conceive of personal responsibility for sin, suffering, and death.

In 1946, the first WHO director, Brock Chisolm, indicated as much, attempting to dissuade people from scapegoating microbes for what in the end were what he understood to be internal perversions of human nature:

The world is sick and the ills are due to the perversion of man; his inability to live with himself. The microbe is not the enemy; science is sufficiently advanced to cope with it were it not for the barriers of superstition, ignorance, religious intolerance, misery and poverty . . . These psychological evils must be understood in order that a remedy might be prescribed, . . . (Farley 2009, p. 17)

Chisholm was trying to divert blame away from microbes and towards the mismanaged inner life of humans. Where Lynteris has identified the “biopolitical indispensability” of vilifying certain microorganisms and animal vectors, Chisholm seems alert to a psychospiritual indispensability of blaming microbes for moral or spiritual failure (Lynteris 2019, p. 1). Germ theory reopens the more palatable notion that rather than being responsible for the consequences of their fallen sinful state, and their actual sinful behavior, Christians are victims of an external evil. Germ theory eclipses the great weight that Irenaeus’ doctrine of the fall placed in humanity’s lap. In this sense, the germ is the creature some North American Christians need to hate. Microbial demonization yields personal absolution.

Far from belittling such a need, we might be sympathetic. As vexing and deadly as the COVID-19 pandemic is, imagine the psychological trauma of previous plagues when no germ was implicated, when plagues’ origins were some combination of demonism, moral failure, cosmic and divine retribution, indifference or ineptitude. Of course, people were hungry for a scapegoat. This hunger can be observed in church history prior to germ theory’s rise. Responding to violence against Jews during the Black Plague, Pope Clement VI (1291–1352) saw the need to release two separate edicts, arguing that Jews were not to blame for the death besetting so many. Even today, the WHO has to fight against the racialized and ethnic monikers used to describe varying illnesses. Trying to suppress notions of a “Spanish flu” or “China virus”, the WHO prefers to animalize disease—with names such as avian or swine flu. In the end, all of these are attempts to locate blame beyond one’s own body, culture, people, or species.

5.3.3. Third, Germ Theory Reignites the Fantasy of Immortality

To clarify, nothing here means to suggest that disease and death are actual forms of divine retribution for sin or misguided behavior. Rather, in the Christian tradition, because humanity is said to inherit the effects of Adam and Eve’s disobedience in and expulsion from Eden, humanity’s natural mortality is no longer kept at bay by Eden’s Tree of Life. Theologians use this story as a way to understand human nature in God’s economy. In the Genesis story, Eve believed the serpent’s lie, that she was immortal, in part because the divine provision of Tree of Life had been keeping her alive. She took for granted that which was supporting her. She confused divine aid in the form of the Tree for her own immortality.

By Irenaeus’ lights, Adam and Eve’s ejection from the garden became a pedagogical tool, showing them and their inheritors that without the aid of the Tree of Life, humans die. This lesson in mortality is the one Irenaeus thought humanity would always need, for he defined the human as the one who is perpetually “unmindful of his own [mortal] lot” (Irenaeus 2015, p. 3.20). In recalling Nash’s account of land developers using germ theory to push the falsehood that white settlers’ fates were independent from the fate of the landscape, the reader might see a reflection of Adam and Eve’s delusion. Eve believed the lie that her fate was independent from that of the garden’s Tree of Life, just like the settlers believed the lie that their health was independent from the land, and just like mid-nineteenth century bacteriologists seeking to eradicate diseases through antimicrobial tactics and environmental interventions. Dubos warned that such pursuits only grew “the illusion that man can control his responses to stimuli and can make adjustments to new ways of life without having to pay for these adaptations” (Anderson 2004, pp. 56–57). This disinclination to acknowledge human interdependence and thus mortality is one key way theologians have defined what makes humans distinct from all other creatures. Echoing Irenaeus, modern theologian Karl Barth finds humanity’s distinction from other animals in their “continual illusions about themselves” (Barth 1960a, p. 240).

For a time, germ theory further contributed to the illusion, especially for white colonial settlers, that humans were bound for a life of far less death.⁵³ As germ theory gained favor in Euro-Western contexts, the colonial theological anthropology of the germ reanimated Edenic grasps for immortality. Latour notes that immortalist claims of “victory over death by science” (Latour 1988, p. 43) surfaced in response to Pasteur’s optimistic announcement

of “a forthcoming triumph . . . against infectious diseases” (ibid., p. 30). Post-World War II, antibiotics and vaccinations prompted expectations that infectious disease was nearing its end (Swerdlow and Johnson 2002, p. 47). The final enclosure of the self through these antimicrobials led surgeon generals and medical school deans to anticipate the end of infectious disease (ibid.). Pasteurian humanity’s prospects were looking up. They were learning to cheat death.

This allure of a modern type of immortalism, or at least of freedom from death by infectious disease, fills out the picture of a theological impulse sitting at the root of (1) global resistance to One Health strategies and emerging infectious frameworks and (2) Christian resistance to theological anthropologies deploying microbial entanglement to increase relationally defined personhood. A modern iteration of that gnostic-esque allure of human immortality, shaped by antimicrobial and colonial notions of mastery, feeds resistance to emergent frameworks. For while an overly simplistic appropriation of germ theory bolsters hope of evading death through conquering all infectious disease, One Health models built on emerging infectious disease paradigms are inherently pessimistic.

To put it more bleakly, with the emergence of emergent disease, virologists live knowing humanity is one mutation away from extinction. Because disease is multispecies, emergent, and dispersed across intersecting dynamics, it no longer works to diagram disease’s movement using old zoonotic cycle models. There is no hope of finding a disease’s animal reservoir and killing it. No hope of separating out microbes from humans. No place where the human belongs that the microbe does not. The old zoonotic cycle has become a web, a messy Venn-like diagram where disease is not the microbe, but the constellation of climate change, biodiversity loss, deforestation, misuse of resources, international travel, displacement migration, pharmaceutical malpractice, and more. The “pathogen” is not a microbe that can be beaten through antimicrobial annihilation—such efforts have only sped up the development of antimicrobial resistant “superbugs” (Ventola 2015). In Dubos’ words, “Eradication of microbial disease is a will-o’-the-wisp . . .”. Whereas germ-centric disease models with their zoonotic cycle diagrams were governed by what Lynteris calls “a topology of hope” (Lynteris 2019, p. 58), the emergence framework is, in his words, “setting entanglement at the center of epidemiological reasoning”, yielding “anticipations of human extinction” (ibid., pp. 59–60).

The inherent pessimism of emergent infectious disease models stands in direct contrast to what the ancient story of a primeval couple, along with Irenaeus in the second century and Barth in the twentieth all identify as a perennial human temptation to cling to grand delusions of human independence and immortality. Meanwhile, germ theory’s theological interruption of Christian theodicy, developed in part to hold such delusions at bay, leaves some Christians all the more inclined to blame-shift and fantasize their way through pandemics.

Amid the COVID-19 pandemic, public health experts lament that nations, with the U.S. leading the way, have resorted to old zoonotic, buffered, colonial instincts. Closing borders, building walls, hoarding vaccines, as if there were no Venn diagram of emergence, as if all things were bufferable in the end. Lynteris recently noted in the wake of the COVID-19 pandemic that the real threat:

is the fantasy that zoonotic transmission can be blocked or halted through technological intervention. This is a late nineteenth-century, essentially colonial fantasy, which is based on a simplistic understanding of disease ecology and has often fostered interventions entailing enormous financial cost, violent interventions in the lives of vulnerable populations and little or no impact on actual animal-to-human infection. (Dey and Lynteris 2021)

Lynteris pinpoints the indispensability of scapegoating animal vectors and the concomitant delusions of colonial mastery as an underexplored factor in the biopolitics of pandemic response. Added to this, I am arguing that scapegoating animal vectors and micro-animals is not only an epidemiological practice, it is also an indispensable religious one. The colonial anthropology of the germ resurrects ancient religious offense at human precarity

and reanimates immortalist fantasy. Zoonotic cycle diagrams reaffirm atomistic, Petri dish ontologies of humans, animals, environments, and disease as well as the religious beliefs about human exceptionalism, security, and hope indexed to those ontologies. Contrarily, emergent infectious disease web diagrams are icons of humanity's seemingly impending extinction, an inevitability that grates against what early Christian theologians identified as a perennial play for immortality and delusional notion of manifest destiny that germ theory supports.

Emergent disease frameworks suggest that disease has less to do with eradicating microbes and animal vectors such as pangolins or bats and more to do with a web of dysfunctional international and interspecies relationships between human holobionts and everything else. All this means that pandemics cannot be stopped. We can only mitigate through rebalancing and restructuring relationships wrapped up with a history of seemingly intractable capitalist and colonial extractive methods. They may be intractable, but they are not inevitable. Prominent figures in epidemiology like Burnet and Dubos sounded early alarms about such methods and perspectives becoming an ecological "threat to all mankind" (ibid., p. 54). Historian Anderson has even said that for those few figures who maintained more ecological approaches to infectious disease, it was precisely their anxious reactions to their settler colonial contexts that led them to reject germ-based epidemiology's reductivism and encouraged their ecological, evolutionary vision of the relatedness of all things (Anderson 2004, pp. 58–59). This essay has laid out some of the technical, theoretical places where the blended story of religious, epidemiological, and colonial interests and impulses explains present resistance to emergent conceptions of human personhood and disease, as well as the historic avoidance of early epidemiological voices calling for another way.

6. Conclusions and Suggestions

If existential angst *a la* inevitable human extinction was once a private anxiety amidst select virologists, that time has ended. In only the past few months, journalists have begun to report on the recent data released from massive computational simulations that help predict the emergence of new diseases based on irreversible climate changes (Yong 2022). Data indicate that in the next decades, forced animal migrations will yield approximately 15,000 incidences of viral spillover, where viruses enter new animal hosts, which vastly increases possibilities for future pandemics (ibid.). As science writer Ed Yong recently put it, "The Anthropocene, an era defined by humanity's power over Earth, is also an era defined by viruses' power over us—a Pandemicene".⁵⁴

Given this state of affairs, I have four modest suggestions. First, whereas theological studies such as this one can foreground the doctrinal significance of shifts in microbiology, it remains to be shown through social scientific data if and how epidemiological imagination impacts actual subjective theodical belief and vice versa. It is hardly the case that theological doctrine is always that which animates popular theological imagination. Qualitative research could help guide if and how much effort theologians might want to invest in helping the church develop nuanced microbial theological anthropologies and shift away from microbially fraught metaphors for sin and evil. Based on this research, churches might do well to provide theological education that tempers a sort of Christian entitlement to or fantasy about natural immortality. Furthermore, just as medical historian Warwick Anderson has observed a longstanding ecological understanding of disease in colonized contexts that have long defied delusions of epidemiological mastery, I would wager a presence of a corresponding sense of mortality and thus anthropological humility. Seeking more nuanced theodicies from theologians who emerge from these contexts would be a helpful step in developing more ecologically honest approaches to questions about pain and suffering.

Second, anthropologists and cultural theorists of pandemics and public health strategies should remain alert to the possibility that where a history of germ theory has influence in a religious tradition, as it does in Christian doctrine, for the adherents of those tradi-

tions, there may be religious or psychological “benefits” to certain disease frameworks and epidemiological diagrams, which increase resistance to more relational, One Health, or symbiotic strategies. When patterns of resistance to some public health strategies emerge alongside attachments to approaches grounded in topologies of hope, such as those Lynteris observes, it may be helpful to remember that such patterns of resistance and optimism have been seen before in varying histories of religion, and have been dealt with. That a foundational claim in Christian teaching about humanity’s natural mortality emerged as a reaction to streams of Platonic and gnostic-esque thought, which presumed the immortality of the human soul, would suggest that the anthropocentric and exceptionalist tendencies bemoaned by scholars like Lynteris are not original to this moment.

Third, practical theologians and religious ethicists should continue developing frameworks for spiritual or moral advancement that do not rely on animal/human binaries that invoke human mastery over and separation from animality and micro-animality.

Fourth, given the psychological and religious comfort germ theories avail as alternatives to classical Christian theodicy, and given the new psycho-spiritual costs of emergent infectious disease paradigms and multispecies narrations of the human, theologians will want to develop theodicies and pastoral care approaches that both seek the spiritual wisdom of communities who have endured deep suffering *and* account for the historical and present interplay of religion and the microbe.⁵⁵

Understanding the way some humans “benefit” from a demonized microbe is necessary groundwork for embracing pro-microbial religious frameworks and emergence-oriented epidemiologies. Thus, this essay intervenes in the fields of theological anthropology and medical anthropology by insisting the reformative possibilities of more emergent and multispecies accounts of ecological porosity and humanity’s microbiality are ample but must take account of the ways that microbiology has never been epidemiological without also being colonial *and* theological. This intervention also opens up new areas of study for scholars at the intersection of religious studies and animal studies. Attending to the biological and cultural history of microbes in order to understand their theological and political stakes reveals both the power of the symbolic deployment of “the germ” and the importance of actually engaging with and understanding microbes themselves.

Funding: This research received no external funding.

Acknowledgments: Thank you to Katharine Mershon, Aaron Gross, and Josh Evans for indispensable feedback (what is beneficial in this essay comes through because of your help; the inadequacies that remain despite your efforts are entirely of my own doing). Thank you to Rob Dunn, for allowing me to join the NCSU Public Science Lab, to Manuel Kleiner for welcoming me into the NCSU microbiome working group, and to Rachel Vaughn and Eben Kirksey for their leadership of the Coronavirus Multispecies Reading Group; in such strange times, the intellectual community offered in these contexts has been expansive and delightful.

Conflicts of Interest: The author declares no conflict of interest.

Notes

- ¹ To date, my favorite thinker considering the influence of this microbial turn is environmental geographer, Jaime Lorimer. Heather Paxson’s work on microbiopolitics and Eben Kirskey and others in the Multispecies Working Group have also been invaluable. See (Lorimer 2018, 2020; Kirksey 2014; Kirksey and Helmreich 2010; Helmreich 2014; Paxson 2008; Dunn 2011).
- ² Where I use the term anthropology, it is almost always in the context of theological anthropology. It is not meant to indicate a Christian version of the fields and methods of cultural anthropology. Rather, “theological anthropology” is the Christian understanding of the meaning of being human, including the huma’s moral status and relationship to the divine.
- ³ When Antonie van Leeuwenhoek first viewed microorganisms through his microscope in 1674, he called them, “very little animalcules”, a name which continues to be used unscientifically by scientists. See Stocken and Ord (1995).
- ⁴ Below, I offer more detail about this transition, which here and below is admittedly over-tidy. On the one hand, medical historian Warwick Anderson admits, “Anyone would think that modern biomedicine is just a matter of culturing germs in the laboratory, identifying their physicochemical properties, and tracking them in the community—that is, little more than microbe hunting”. On the other hand, Anderson has searched back through “the history of infectious diseases research in the twentieth century to

recover various emerging forms of ecological understanding from what has sometimes seemed an arid waste of reductionism". Given the interdisciplinary complexity of the argument, for the sake of clarity, I remain tidy above, but attempt to "untidy" my own reductive account in footnotes. [Anderson \(2004\)](#).

5 This entire essay could be seen as a response to recent social scientific research that determined eight priorities for the direction of social science research on the microbiome, the following two of which relate to this essay's inquiry: First, "To collaborate with scholars in the arts and humanities to understand how particular versions, imaginaries or narratives of the microbiome gain credibility and circulate," and second, "to consider the impact of microbial knowledges on social practices, including senses of self, identity and citizenship". The Oxford Interdisciplinary Microbiome Project (IMP) helped organize and fund this scientific research and was supported by the John Fell Fund and the Economic and Social Research Council. [Greenhough et al. \(2020\)](#).

6 For a philosophical account of the history and science of microbiology, see [O'Malley \(2014\)](#).

7 More accurately, the basic unit of microbiology became homogeneous *colonies* of microbial species or, more rarely, actual individual microbial cells, often classified as "germs".

8 [Douglas \(2002\)](#). Admittedly, the construction of the germ is an anthropocentric one. From the perspective of many microbes, they are exactly where they are supposed to be.

9 Anderson complicates this history by foregrounding a spattering of scientists who approached bacteriology with far more ecological sensibilities. [Anderson \(2004\)](#).

10 Gnotobiotics can also mean the science of studying animals where every microbe is known and controlled. Gnotobiotics had its most visible cultural touchpoint through the infamous bioethical failure of attempts to treat immunocompromised child, David Vetter, through bio-isolation, a story popularized by the John Travolta film *The Boy in the Plastic Bubble* (1976). For more, see [Basic and Bleich \(2019\)](#).

11 Rob Dunn has reminded me that while gnotobiotics has been debunked as an a-microbial way of life, the technology of controlling and manipulating microbial life in organisms remains important for studying microbial interactions.

12 Metagenomics refers to the study of metagenomes, or the full sequence of genetic material that has been extracted from one environment—the genetic sequence of all of the microbial life from a cheek swab, or water sample, for example. Microbiota refers to the living microbes in a multi-species microbial assemblage. The metagenome would be the genetic sequence of all the microbiota and the microbiome is technically the microbes, their genetic material, and also possibly the "theatre of activity" that all together makes up a biome or "a reasonably well-defined habitat that which has distinct bio-physico-chemical properties" ([Berg et al. 2020](#)).

13 Some readers' attention may at this point may rightly be wandering towards more indigenous epistemologies that emphasize relationality and holism over isolated entities and individuation.

14 Aside from my own work, the earliest explicit engagements with human microbiality that I have found are by Wesley Wildman and Denise Kimber Buell. See ([Wildman 2010](#); [Buell 2014](#); [Al-Attas Bradford 2021](#)).

15 Genesis 1:26–27: "Then God said, 'Let us make humankind in our image, according to our likeness; and let them have dominion over the fish of the sea, and over the birds of the air, and over the cattle, and over all the wild animals of the earth, and over every creeping thing that creeps upon the earth'. So God created humankind in his image in the image of God he created them; male and female he created them". New Revised Standard Version.

16 This unfortunate interpretation of the scant biblical reference is not the only one. For an example of a more expansive reading of the *imago dei*, see [Moore and Kearns \(2014\)](#).

17 For microbial influences on psychological health, see [Sarkar et al. \(2018\)](#); on cognitive function, see [Novotny et al. \(2019\)](#) and [Finlay et al. \(2016\)](#). Scientists do not fully understand the pathways for microbial influence on the mind and behavior. For a fairly accessible summary of the possibilities, see [Howes \(2019\)](#).

18 While theologians have only just begun to deploy the microbiome to nurture a more ecological theological anthropology, eco-theologians have been working to highlight human dependence for decades, and even the biblical writers and early theologians reflected on the greatness of the cosmos as a way of invoking anthropological humility. For three modern examples, see ([McFarland 2014](#); [Dean-Drummond and Clough 2009](#); [Kelsey 2009](#)). Notwithstanding the richness of such contributions, with the microbiome, new opportunities and problems emerge because of the disappearing boundary between the human and the other.

19 For a summary of the key scientists whose work foreshadowed more ecologically attuned frameworks for pathogenicity that developed in the wake of events such as the global AIDS pandemic, see [Anderson \(2004\)](#).

20 Still, I appreciate Kyla Wazana Tompkins' warning: "be suspicious of any intellectual movement that calls itself 'new'—because of course we need to always ask: what is the heroic narrative that its putative 'newness' seeks to instantiate? A non-human centered ontology and ethics; a sense of the biological and non-biological world as vital and alive; these . . . can hardly be said to have recently been invented but rather are familiar to, among others, First Nations and Indigenous peoples; to those humans who have never quite been human enough . . ." ([Tompkins 2016](#)).

21 This is not to demote microorganisms to the status of a non-living or passive subject. Beyond the debate about whether viruses are alive, in theology, "the environment" is a rather broad and less technical term to indicate "the world out there", where both plant and animal and micro-animal life are included.

- 22 By referencing the following examples of such resistance, I do not mean to suggest that such incidences, even where patterns are noted, are emblematic of the Christian church at large or even of the denominations and traditions from which the following individuals come. The global church is far too diverse in its manifold incarnations to be defined by any one particular example or story told below.
- 23 As mentioned above, these particular stories and figures do not represent their theological traditions or ecclesial bodies. Even so, the individual incidents merit attention and were hardly idiosyncratic even if they did not reflect the majority opinion of any given tradition.
- 24 Lock (1984, p. 3). Not incidentally, Dubos, one of the key thinkers whose ecological sense of disease anticipates and nurtures the late twentieth-century turn, is credited for coining the phrase, “think globally, act locally”, which is indicative of his conviction that the realm of the environment is entwined with all aspects of human wellness. His views become the foundation for the One Health models explored below Honigsbaum (2017).
- 25 My previous doctoral work began as a theological critique of this antibiotic eucharistic phenomenon.
- 26 Justine Murison similarly clarifies, “The hallmark of Western secularity is not so much a disenchanting subject, but a conflicted relation between a psychology defined by disenchantment and a theory of the body open to a world of invisible and untraceable forces” Murison (2015).
- 27 For the sake of keeping the argument moving, I admit to “cleaning up” what is a far more complicated, fluid history, with Burnet himself being a prime example. Although Cohen points to Burnet’s theory as that which finally enclosed disease and personhood, Burnet is nevertheless a key early twentieth-century thinker who thought in a more environmental and relational way about disease, as Anderson’s research shows. Burnet, writing for a popular audience, argues, “infectious disease can be thought of with profit along ecological lines as a struggle for existence between man and micro-organisms” (Anderson 2004, p. 49). Perhaps even more disruptive to the binary I use as a heuristic above, Burnet maintained that disease was “a manifestation of the interaction of living beings” (ibid., p. 49).
- 28 Whereas the aforementioned bishops could not abide Jesus as a vector of disease, animals as vectors have been readily acknowledged.
- 29 Lynteris explains how these efforts “entangled with racial, national, colonial, vocational, geopolitical, and class narratives and agendas” (ibid., p. 47).
- 30 Or at least so it went in the Euro-Western and settler colonial context.
- 31 This emergent framework was long anticipated by a stream of physicians, microbiologists, and epidemiologists who all along maintained and developed an environmental, relational, and thus ecological sense of disease. See Anderson (2004).
- 32 Anderson, attentive to the colonial aspects of this separate-and-eradicate approach, highlights how this mastery and blame is far more of a colonial phenomenon. “In the developing world, however, there had never been much cause for contentment, for there the impact of economic development on microbial abundance and distribution was still demonstrated daily. Ecological insight was rarely absent from tropical medicine; thus, in a sense, ‘mainstream’ science was simply catching up, recognizing that disease even in Europe America might be the outcome of dynamic processes in a global ecosystem” (Anderson 2004, p. 59).
- 33 This is not exactly true. One Health frameworks have been around for as long as zoonotic understandings have been. However, it is the increased understanding of EIDs that has made One Health models a global public health strategy.
- 34 Antibiotic treatments have saved millions of lives from communicable diseases. Nevertheless, medical and public health experts increasingly acknowledge that the ordering of life against the microbe is counterproductive to One Health efforts. Antimicrobial practices are linked to the prevalence of new modern non-communicable diseases that are auto-immune, allergenic and inflammatory in nature.
- 35 For an in-depth theological account of the indistinguishable theological and colonialist origins of racism, see Jennings (2010).
- 36 The land “settled” in or “colonized” white bodies even as white bodies and diseases settled in and colonized native lands and bodies.
- 37 Nash (2006, pp. 80–81). This racializing of disease happens on a number of planes, including the suggestion that although when white settlers were sick, it was due to infection, native populations succumbed to illness due to vices and uncontrolled passions. See ibid., chp. 2. Furthermore, Nash argues that the eclipse of the narrative of the rampant death of settlers due to disease is itself an attempt to “naturalize” the superiority of white bodies and the “destiny” of white colonization and conquest.
- 38 To attend to the messier fringes of this history, see Janelle Schwartz’s proposal that worms (i.e., visible microbes) “informed the Romantic period’s consideration of man as both a part of and apart from the natural world” (Schwartz 2012, p. 4). Schwartz’s account shows that precursors to the modern self can be found well before the modern transition to a buffered self. Additionally, Latour’s microbes are also agents in a biopolitical world where all were clamoring for power Latour (1988).
- 39 For an in-depth exposition of the development of fall doctrine in this early period, see Williams (1938).
- 40 The best place to see Aquinas’ view are in his treatment of Augustine’s views: Aquinas writes, “The tree of life, like a drug, warded off all bodily corruption.” Here, a tree keeps the mortal couple from death. Augustine continues “ . . . therefore, since the power of the tree of life was finite, man’s life was to be preserved for a definite time by partaking of it once; and when that time had elapsed, man was to be either transferred to a spiritual life, or had need to eat once more of the tree of life. From this the replies to the objections clearly appear. For the first proves that the tree of life did not absolutely cause immortality; while the

others show that it caused incorruption by warding off corruption, according to the explanation given above" (Aquinas 1981, I, q. 97, a. 4. Co).

- 41 For an account of Adam and Eve's fall, see Genesis 3:1–5. To see how Irenaeus boils down the devil's Edenic temptation to a lie about Adam and Eve's immortality, see Irenaeus (2015, p. 3.23.5).
- 42 Athanasius, Augustine, and Maximus developed Irenaeus' affirmation of matter through *ex nihilo* doctrine. If no pre-existing substrate forced God's hand in creation, all flesh must be Good.
- 43 Yet again, this is a "tidied" history whose edges are anything but. Inkling of disease having substantial ontology date back at least to Girolamo Fracastoro (1476/8–1553). Even so, my intent is to show the general trend and shifts. I attend in more detail to the texture of epidemiological history in Bradford, 4.3.2.
- 44 Beard (2020). It should be noted that the denominational website also has a thorough list of resources about how to navigate the pandemic safely, including links to the CDC and WHO websites. Of further note, Beard is known for his life quote: "I want to be so full of Jesus that when a mosquito bites me it will fly away humming 'there is power in the blood'".
- 45 The point is not to equate the two (microbes or Black lives), but to note how expansive the logic is, how demonizing microbes paves the way for oppression of "the other".
- 46 We could call it a glitch, except why should we be surprised that with its extractive mode of knowing and defining life, and deployed to colonial ends, germ theory leads to demonization and scapegoating for some, and delusions of innocence for others?
- 47 Rather than thinking of the inherited sinful nature as an exogenous intrusion liken to microbial pathogens, Christian thinkers might want to liken inherited sin to that 8% of the human genome sequence that comes from ancient human endogenous retroviruses that infected our ancient ancestors. See Lander et al. (2001, accessed 1 August 2022).
- 48 To be fair, sin is characterized both as an internal and external phenomenon in Christian scripture and theology. However, I would wager that the places where pre-Pasteurian descriptions have intended to emphasize a humoral, endogenous aspect to sin (seen especially when describing an inherited sin-state, which is nevertheless viewed in a postlapsarian world as native to human experience), germ theory's exogenous nature confuses these descriptions of contagion.
- 49 "For I do not do the good I want, but the evil I do not want is what I do". Romans 7.19, NRSV.
- 50 Latour (1988, p. 32). That said, both the presence of HERVS and the influence of the microbiome on human behavior complicate the matter, but not in a way that separates a person from their actions (Stilling et al. 2016).
- 51 *ibid.*, p. 143. Note, Donald Trump is a self-proclaimed germaphobe, and this was long prior to the 2020 pandemic.
- 52 *ibid.* Trump's xenophobic border policies exemplified this strategy. Obsessing over "foreigners" breaching U.S. borders to hide the domestic terrors of white supremacy and police brutality, Trump hid internal disorder by exaggerating external "disease". This was also his COVID-19 strategy—downplay social and bioeconomic COVID-19 struggles by obsessing over the "China virus".
- 53 In other words, where Barth speaks of the human in universals, a decolonial perspective demonstrates that such delusions of immortality and distinction are more (though not entirely) particular to certain contexts.
- 54 *ibid.* As many have noted, the language of "anthropocene" can paint with too broad a brush that erases particularity and masks an ecology of capitalist, colonial, and patriarchal structures while also doubling down on anthropocentrism. See (Haraway 2016; Crist 2013; Moore 2015).
- 55 This essay pulls heavily from my dissertation work and at any number of places draws quite closely from that manuscript. I have more than likely poached phrases and sentences without always acknowledging as much.

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