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The Microbial Self

Sensation and Sympoiesis

KYLA SCHULLER

The idea that we people are really walking assemblages, beings who have integrated various other kinds of organisms—that each of us is a sort of loose committee—opens up . . . many challenging speculations. When “the committee” gets sick, is simply a single animal getting sick, or is illness more a rearrangement of the members?
—Lynn Margulis and Dorion Sagan, *Acquiring Genomes*, 19

Consider the spirochete. A long, narrow, tightly coiled bacterium featuring internal flagella bundled together in sheaths, the spirochete propels itself forward through continuous rotation. Spirochetes, in other words, are adept tiny drills, far too small to be detected by standard microscopy. They penetrate tissues of the human body that bacteria typically cannot enter and that pursuant immune leukocytes have difficulty reaching: mammalian and avian brain, bone, cartilage, and gelatinous connective tissue. They also bore through individual cell walls. Thus, once spirochetes have drilled into the body, they often remain.

Emergent microbiology research suggests that spirochete infections are likely relations for the long haul, with ramifications still largely unknown. Some spirochetes have long-term symbiotic relationships with the bodies they dwell within, with effects both beneficial and disastrous. Several, such as *Treponema pallidum* and *Borrelia burgdorferi*, are notorious for their capacity to cross the mammalian blood-brain barrier, a homeostasis-ensuring endothelial layer lining blood and lymphatic vessels that protects the brain and also prevents

the passage of most medication into brain tissue. These bacteria result in syphilis and Lyme disease, respectively, both devastating, multisystemic illnesses. The latter is embroiled in a heated controversy: Do the ongoing, often-disabling sensory, affective, cognitive, and muscular-skeletal symptoms experienced by hundreds of thousands of Lyme patients for months and years—even after the recommended twenty-eight days of antibiotic therapy—reflect chronic infection, as patients, activists, and their Lyme-literate physicians insist? Or are these symptoms signs of a lingering postinfection inflammatory syndrome that fails to respond to further antibiotic treatment, as most infectious disease practitioners and researchers, and authorities including the Centers for Disease Control and Prevention (CDC) and Infectious Disease Society of America (IDSA), advise?¹ Tens of thousands of patients are caught in these Lyme wars, a debate that enables health insurance companies to deny coverage to even the most debilitated patients beyond the recommended short courses of treatment.²

Yet the very terms of this controversy, which hinge on competing explanations of ongoing infection or noninfectious inflammatory response, are themselves stuck within an increasingly obsolete biomedical model that positions spirochetes and other so-called harmful bacteria as pathogenic intruders into the inviolate well body. The debate as typically construed in a clinical setting concerns the temporality of infection rather than the validity of the conventional infection model to which both sides ascribe. It is this biomedical model, in which the body is positioned as a discrete milieu that must be defended against external pathogens, that spirochetes most clearly destabilize.³

The individual human body is entangled in spirals with spirochetes, unfolding and enfolding in dynamic relation with the bacteria in ways that challenge conventional notions of infection, disease, and health. The late microbiologist Lynn Margulis and her lab insisted that existing research demonstrates the “irreversible integration of spirochetes at behavioral, metabolic, gene product and genetic levels into animal tissue,” integration that impacts species change over time.⁴ Margulis’s lab provocatively asks if spirochete illness is “better described as an obligate and ancient symbiosis where the bionts (spirochetes and humans) are integrated at the behavioral, metabolic and genetic level rather than a new viral [or bacterial] infection?”⁵ For Eva Hayward,

infection discourse is itself a key player in the fiction of the human subject, a discourse that paradoxically “exposes the symptom that our body has never been our own.”⁶ The rise of the Human Microbiome Project and related investigations suggests that medical research is slowly inching toward a perspective increasingly insisted on by environmental humanities scholars and embraced by publics at large—that we live our lives fully imbricated with our environments, including microbial life-forms, which not only are interdependent with us but, more fundamentally, do not preexist as separate entities. Given that spirochete infections are notorious for the extensive neurological and psychiatric symptoms they produce, rethinking spirochetes as symbiotic partners of coevolution as Margulis does impacts more than the important treatment debate about the nature of chronic Lyme disease. It also challenges common knowledge about the nervous system and emotional and affective capacity as pertaining to a singular self.

In this essay, I bring together environmental humanities work by scholars including Kath Weston, Donna Haraway, and Eva Hayward that erodes humanist paradigms of the self-possessive individual by emphasizing the multispecies entanglements of which species are constituted with a medical humanities perspective that attends to illness as subjective experience, including how humans experience, conceive of, and narrate bodily suffering. The paradigm shift from spirochete infection to symbiotic relationship (if also detrimental in the life span of individual humans) challenges not only dominant immunological models but also the coherence of the long-standing notion of sensation as a self-constituting mechanism of the individuated subject. I examine spirochete illness—particularly its extensive neurological manifestations as experienced by patients, including myself—to ask, What happens not only to our notion of infectious disease but, more broadly, to the very idea of the subject and the sensations of which it is constituted, when the individual is understood to be produced through the microbial ecologies of which it is a part? What becomes of the self when the body and its sensations are understood to be forged through ongoing, coconstituting relationships with microbial life? I argue that spirochete illness exposes how the human sensory and emotional apparatus doesn't pertain to a singular subject but to a complex microbial choreography of which the human is one part. In Lyme patient groups in particular, we are witnessing the rise of the

microbial self, or a notion of personhood in which the subject and its self-constituting sensations and affective states emerge within a spiral of interspecies entanglement. The microbial self has the potential to challenge the narrative of the self-possessive individual on which the political tradition of liberalism depends.

Diagnosed patients represent only a small fraction of the human cost of Lyme, as up to 90 percent of those infected remain undiagnosed and are often labeled instead with autoimmune and psychiatric conditions such as fibromyalgia, multiple sclerosis, and depression and offered palliative treatments with little hope of redressing the underlying microbial imbalance.⁷ These patients are casualties of biomedicine's traditional infection model, which understands the body's immune system as an army set to defend the organism from invading troops, and antibiotics as typically potent weapons that have vanquished most types of existing infection, except in the case of newly evolved forms of antibiotic resistance among bacteria such as staph.⁸ Yet a growing number of neurologists suspect long-dormant but reawakened microbial colonies of spirochetes and herpes virus located in the brain and encased within a protective layer of biofilm that renders both antibiotics and immune leukocytes ineffective to be the causative agents of the beta-amyloid plaque associated with Alzheimer's disease.⁹ If chronic Lyme patients and new Alzheimer's researchers are to be believed, then we have not yet begun to understand the depth of our body's interdependence with microbial species. Nor have we developed truly effective pharmaceutical compounds that can eradicate pathogenic bacteria in all its forms, including the protective biofilm layers that grow around microbe complexes—much less while failing to do harm to the trillions of beneficial microorganisms dwelling throughout our bodies.

For all *Borrelia's* sophistication in penetrating the body and avoiding annihilation by the human immune system—it even actively suppresses immune activity by eliminating lymphocytes, much like HIV—it may be less exceptional than exemplary of the extraordinary imbrication of human and bacterial life. For Margulis, a spirochete's relationship with its host is best characterized as an inextricable symbiosis that includes the transfer of its genome over evolutionary epochs to the

species it dwells within, rather than the temporary invasion of an infectious pathogen within the course of a single life span. “Infections by spirochetes in humans, when seen in their evolutionary and ecological context,” she and her coauthors write, “are examples of cyclical symbioses that have evolved over geologic time.”¹⁰ Spirochetes are emblematic of the process that she and her coauthor Dorion Sagan name “symbiogenesis,” or the creation of new species through organisms’ acquisition and incorporation of the complete genome of other organisms.¹¹ For Margulis and Sagan, symbiogenesis, not natural selection, is responsible for the origin of species. In the 1970s Margulis first proposed that all cells with nuclei evolved from the merger of the genomes of single-celled archaea organisms with eubacteria, a theory of the bacterial origins of all multicellular life that the mainstream scientific community has finally accepted after a period of more than thirty years. Yet while Margulis’s theory of the bacterial provenance of the nucleated cell and its organelles such as mitochondria and chloroplasts has now generally been adopted, it is still generally rejected as an explanation for the emergence of new plant and animal forms. In some of her last work, Margulis and her various coauthors propose that spirochetes develop symbiotic relationships with their mammalian hosts, over the life span of the individual as well as the evolutionary time of the species.¹² They argue, for example, that all flagella, including the tails of human sperm, have evolved due to genome transfer from spirochetes to other organisms.¹³ Margulis and her coauthors summarize, “The likelihood that these two spirochete infections, syphilis and Lyme disease, correlate with the establishment of permanent human-spirochete symbioses soon after entry of the bacteria into tissue has been insufficiently investigated.”¹⁴ Our own mitochondria originate from bacteria. Is it too much of a stretch to consider that our bodily systems (beyond the gastrointestinal), not only the discrete cells that form them, have also developed and continue to function in concert with microbial life?

Both syphilis and Lyme disease, in their late tertiary stages, are associated with severe sensory, psychiatric, and cognitive disturbances. These include conditions ranging from schizophrenia, psychosis, and autism spectrum-like disorders to more specific neural malfunctions, including auditory, visual, and olfactory hallucinations; depersonalization; neuropathy; synesthesia; and sensory acuity. If we consider spirochetal infections to be lifelong and species-long relations,

as Margulis does, rather than temporary and easily treatable infectious agents in the age of penicillin and tetracyclines, as the CDC and IDSA insist, then these neurological symptoms suggest that our emotional, affective, and sensory capacities are deeply intertwined with the microbial worlds that suffuse us and of which we are a part.

That our nervous system is inseparable from the teeming microbial life within our guts—and that evolved our very cells—should not be too surprising. The gut is the location of our “second brain,” or the enteric nervous system, which contains all the classes of neurotransmitters known to exist in the central nervous system and produces 95 percent of our serotonin.¹⁵ While nineteenth-century neurologists conceived of executive authority to be distributed throughout the body, their twentieth-century counterparts localized it in the central nervous system.¹⁶ Currently, however, the enteric nervous system is emerging as a fundamental, rather than accessory, element of neurological function. As feminist science studies scholar Elizabeth A. Wilson puts it in *Gut Feminism*, “the [neurological] periphery is a site of intense biological, pharmaceutical, and psychological agency on which the center is always vitally dependent,” such that “the stomach is intrinsic to mind.”¹⁷ Wilson’s book, however, largely conceives of the enteric nervous system as a solitary unit comprised solely of human material. Her notion of gut feminism importantly contests the cerebral focus of neuroscience and psychiatry and insists on the embodied mind, yet it generally leaves intact the notion of a singular neurological subject.¹⁸ *Gut Feminism*’s conclusion does importantly turn to the gut as a space brimming with microbial life, briefly reflecting on recent gut-microbiome and anxiety research, to speculate on the idea of “a dispersed nervousness that traffics (biologically) between gut and brain, and also across that crucial evolutionary divide of vertebrate and invertebrate, and among the organic kingdoms (animalia, plantae, bacteria).”¹⁹ It is this emergent picture of a distributed nervous system, one in which the enteric nervous system is itself a member of a vital ecology, that needs further theorization in light of current research, patient experience, and narratives of life lived in the prologue of ecological disaster. The nervous system no longer pertains to a singular, discrete subject, as can be glimpsed even amid work arguing the contrary.

Sensory experience plays a pivotal role in the process of self-constitution according to the conventional humanist teleology. Sensation gathers experience into the flesh while reinforcing the distinction between the subject and its environment, thereby forming a central element of autopoiesis, or the independent self-making of the liberal individual.²⁰ The body properly impressed by its sensory experience moves forward through time and develops the capacity to regulate its pursuit of feeling, achieving the self-possession characteristic of civilization.²¹ In liberal humanism, the subject emerges through the subjection of sensation to the future-oriented process of autopoiesis, thereby ensuring the body's biopolitical viability. Drawing on Margulis and others, Donna Haraway has recently proposed sympoiesis as a schematic of life growth marked by the ongoing dynamics of "making-with," which enfolds with the individuated (but not solitary) process of autopoiesis.²² "To be animal is to become-with bacteria (and, no doubt, viruses and many other sorts of critters)," Haraway contends, such that relationalities, rather than individuated types, ought to lie at the center of the ecological imagination.²³ "Including human people, critters are in each other's presence, or better, inside each other's tubes, folds, and crevices, insides and outsides," rendering paradigms of human, species, or environment comprised of individuated objects in interaction figments of the humanist worldview that has brought us to the edge of planetary chaos.²⁴ For Haraway, sympoiesis marks both a descriptor of the entanglements that underpin life—and not necessarily to the advantage of human survival—and offers a model for new forms of multispecies kinship that will be necessary amid an increasingly precarious existence.

Sensation and emotion arise from microbial entanglements, and these spiraled relations condition the subject. Drawing on the sensory regime that lies at the heart of the notion of autopoiesis, we might also use Haraway to think of how "multi-species becoming-with" affects sensory and affective capacity, not only body ecologies.²⁵ "What we imagine as the subject is in some ways a hallucination of microbial activity," Eva Hayward proposes.²⁶ If autopoiesis produces the subject through the gradual incorporation of sensation, then in sympoiesis it is the process of becoming-with that produces sensation, and the individuated subject as well as its hierarchies of mind and body are a fiction. It is not only that spirochete patients experience hallucination but that spirochetal relations hallucinate the subject.

How do individuals manage autopoiesis in the context of explicit bacterial sympoiesis, a process that is far from romantic and most often narrated as a theft of life? Perhaps it resembles the notorious “herx.” A herx—short for Jarisch-Herxheimer reaction, named after the two dermatologists at the turn of the twentieth century who discovered the effect in syphilis patients—denotes the worsening of symptoms of spirochete infection as the bacteria die en masse following the onset or increase of any antimicrobial treatment. The symbiotic relationship persists and intensifies when one of the species is dying. When spirochetes go, it is as if they wrench slowly from your tissues. A herx can include dozens of seizures per day, riveting pain akin to nails hammered through the flesh, or fatigue so total the only movements one can muster is to lift the head off the pillow. When I herx, often for weeks at a time, my migraine-addled brain works so slowly that moving objects make me cry out of confusion and fear. My vertigo, severe weakness, and constant twitching intensify, leaving me unable to walk unless I keep myself upright by dragging my shoulders along a wall, herking and jerking as I go. Spirochetes’ cellular-level entanglement continues long after their useful life, as their fragmented parts (most antibiotics kill bacteria through preventing cell-wall formation during their replication) continue to stimulate the immune system to unleash havoc, which makes no distinction between whole and part, living or dead. These effects produced by the disintegrating spirochetes—whether they are due to the release of bacterial endotoxins or inflammatory immune response is still poorly understood—can last anywhere from several hours to several weeks. For the patient, this is a particularly cruel form of torture. Treatment means a greater intimacy with unbearable symptoms afflicting a body that paradoxically no longer feels to be one’s own. The neurological effects of Lyme make brutally palpable the notion that my nervous system does not pertain to my “self” alone but functions through complex interactions between my peripheral and central nervous systems and the microbial worlds of which I am a part. Sympoiesis includes spirals of flourishing and wasting away.

The possibility that the process of self-making and therefore sensation and consciousness function via a multispecies interaction courses throughout Lyme patient experience. One patient writes on an online Lyme forum, “What is really hard to explain to someone who has never been through it, is the unique torment of days filled with

sensations and events that you can't know with certainty even exist. Did I hallucinate that smell, those sounds, or is there someone else in the house? And if that isn't real, how can this physical pain be so tortuous?"²⁷ One of Lyme's strangest manifestations is quite likely in the form of the discredited Morgellons disease, an excruciating condition from which Joni Mitchell currently, and somewhat infamously, suffers. The illness is marked by a relentless crawling sensation, as if bugs were trafficking just above and below the surface of the skin, and small open sores out of which grow filaments reminiscent of thread or another fiber, as if the human body itself had begun to sprout flagella. Medical authorities generally view Morgellons as an unexplained syndrome most likely psychiatric in nature, similar to other sensory disorders, such as Multiple Chemical Sensitivity (MCS), that official medical bodies relegate to the status of physiological manifestations of mental illness.²⁸ Studies assert that the filaments growing from the skin are likely clothing, carpet, or other fabric remnants that have made their way into the flesh torn by these delusional patients.²⁹ Yet in 2015 several well-known Lyme researcher-activists tested twenty-five Morgellons patients for the presence of *Borrelia burgdorferi* via DNA recognition and identified Lyme spirochetes in twenty-four of them.³⁰ Similarly, Lyme-literate physicians insist that MCS is a common symptom of Lyme infection, as well as of the fungal infection *Candida albicans*. The microbial relations resulting in Lyme disease are often undetected clinically, leaving patients ripe for diagnoses of somaticization and conversion disorders or similar psychopathological explanations.³¹

Yet a wide range of illnesses currently labeled psychosomatic may actually be a multispecies, physiological phenomena undetectable by routine laboratory analysis. More broadly, the very idea of psychosomatic falls apart when we consider the many species that make up each half of that word, which is so often thrown at women whose individual bodies betray the principles of "evidence-based medicine" derived via studies that measure population-level outcomes. Patients of chronic tick-borne diseases have developed a microbial vocabulary for expressing their heightened and often scary emotional states—"Lyme rage" and "Bartonella rage" are frequently bandied about in online discussions to describe uncharacteristically explosive anger that seems to come from nowhere. Some Lyme patients admit to homicidal urges in the throes of their heaviest symptom periods, urges that bear no relation to what

they understand as their pre-Lyme selves. The phrase “Lyme rage” has guided strategies for courtroom criminal defense.³² The actions of Travis the chimp, who infamously mauled the face of a friend of his Connecticut “owner” in 2009, have been contextualized in light of his ongoing Lyme treatment.³³ Some Lyme activists have even speculated that Sandy Hook Elementary School shooter Adam Lanza suffered from undiagnosed congenital Lyme on the basis of school reports of his neurological abnormalities; his mother’s multiple sclerosis, a diagnosis many Lyme patients receive; and their Newton, Connecticut, location in the heart of the epidemic—an area so affected, and consequently so intimately acquainted with its psychiatric and cognitive presentations, that school teachers had been instructed to report rapid-onset behavioral changes so that students may be evaluated for Lyme.³⁴ These emergent paradigms press on the fiction of the solitary self, however uncomfortably at times. As animal studies theorist Neel Ahuja advises, “the greatest error of anthropomorphism is not that animals or objects are incorrectly attributed human characteristics; it is that those viewed as transparently human are extracted as such from their constitution in a broader domain of biosocial life.”³⁵ Which “somas” does *psychosomatic* refer to and which psyche—the singular and isolated nervous system or the sensory faculty resulting from the gut-brain connection in which the nervous system is imbricated within the intestinal microbiome? The psyche no longer belongs to the singular subject.

We might think of the sensory effects of spirochetal illness as not only the pathogenic results of a bacterial infection but, more generally, as a heightened state of the interspecies relations that are increasingly understood to constitute the human body, including its nervous, gastrointestinal, and immune systems. Lyme is a particular set piece within a larger interactionist choreography between mammal, arachnid, and microbe, one that comes to aggregate each of these classes of animal. To be sure, the neurological effects of spirochetal infections are drastic. Tertiary syphilis is marked by the syndrome PARESIS, an acronym naming “Personality disturbances, Affect abnormalities, Reflex hyperactivity, Eye abnormalities, Sensorium changes, Intellectual impairment and Slurred speech”—as thorough a profile of sensory and

neurological disorder as one might imagine, which can infamously result in descent into madness.³⁶ Yet a range of psychological conditions is increasingly understood to be connected to microbial relations. Studies have identified the absence of particular beneficial gut-bacterial strains with symptoms of anxiety and depression, and the presence of candida fungal infections with the same, as well as anger, irritability, and insomnia.³⁷ These findings are beginning to make their way into supplement production and clinical practice, particularly in functional and integrative medicine. Paleo-diet blogs are rife with stories of the cinematic-quality dream life and restful sleep that ensues when one deliberately feeds the gut microbiome at least twenty milligrams per day of resistant starch, a dietary fiber that humans cannot digest but on which our much-beleaguered beneficial microbiota depend. In other words, even dreams—traditionally the purview of the singular, if multitemporal, psyche—may be less the result of solitary consciousness and its biochemical basis than the result of the complex interactions between our neural makeup and the micoroganisms on which we depend for survival.

Sensation, in this view, becomes a phenomenon of the evolution of species, rather than a property of the individual self. Sensation marks the process of the subject when the self is forced to reckon with its own internal multiplicity. The chronic potential of spirochete illness is just one element of a teeming, newly discovered world of microbial relations that suggest that we might think of cognition, emotion, motor function, and sensory manifestation as a multispecies performance, one with many opportunities to go awry. Anthropologist Kath Weston has recently asserted that peoples across the globe are increasingly engaging in a “visceral” way with a “recursively constituted ‘environment’ that is also, crucially, them.”³⁸ She elaborates on “newfound eco-intimacies” to characterize how in the current era of the Anthropocene people increasingly approach their relations with the porous, inseparable phenomena of natural resources and technology, relations both deliberately cultivated and those proliferating unbidden across the differentially vulnerable bodies they help constitute.³⁹ In the case of microbial relations, those intimacies are understood in a literal way as conditioning sensation and the subject.

We are witnessing the rise of the “microbial self,” or a notion of personhood in which the subject and its self-constituting sensations

and affective states emerge within a network of interspecies interdependence. Together, this research and patient-produced discourse suggest that we are beginning to think of sensation and psychic life in relation to a multispecies subject, to think of the self as a compilation of creatures whose emotional and affective states are the yield of countless symbiotic relations. The microbial self is a new type of multifactorial subject that is not fractured spatiotemporally, as with the layers of the Freudian subconscious, but rather synchronically consolidates a range of genetically and morphologically distinct material through the dynamics of homeostasis. In proposing the “microbial self,” I am not interested in reifying the “self” part of the phrase but rather emphasizing an interactionist subjectivity in which the unitary self dissolves within a network of sympoietic relation. Fermenters, fecal transplanters, gardeners, composters, and probiotics swallows embrace their interdependence with bacterial, fungal, and viral life-forms as important elements of individual and ecological well-being. Reflecting on the consequences of his research into the gut biome for his own subjectivity, Michael Pollan relates that he “began to think of [himself] in the first-person plural—as a superorganism, that is, rather than a plain old individual human being.”⁴⁰ His words reflect a fantasy of posthumanist triumph markedly different in tone, if not in kind, from that of chronic-infection patients. This relation is not necessarily rosy or even sustainable to the human—it can involve the imbricated spirals of the spirochetal and human genome—even as it conjures the possibility of dreams without a dreamer.⁴¹

Shifting from genetic, neural, and hormonally determined notions of singular-subject formation to a multi-life-form idea of the subject and the sensorium, the microbial self figures as a type of personhood consolidating in the aftermath of genetic determinisms. It takes shape among the increasingly fragile practices of self-constitution among the bourgeoisie of the Anthropocene, as carbon-induced climate change draws different kingdoms of life into ever-closer interaction that presses on and queers the fiction of the self-possessive liberal individual. I take up *queer* here in Neel Ahuja’s sense: “To recognize that life is ambiently queer is to divest from spectacular temporalities of crisis and transcendence that infuse queer theory and environmentalism alike,” instead “tracing an affective materiality” of multispecies entanglement “that interrupts anthropocentric body logics and space-

time continuums.”⁴² The CDC estimates that three out of five new illnesses are zoonotic in nature—meaning that they cross species barriers—due to collapsing habitats: Ebola, tick-borne disease, Zika, and HIV all fall within this scope.⁴³ The microbial self forms out of this horizon of symbiosis as members of increasingly imperiled high-carbon-producing nations begin to think of the reified individual in relation to the evolution of species and the planet. While much of this rhetoric conveys panic that global threats have penetrated Connecticut backyards—and that existing health authorities are failing in their long-accustomed duty to securitize the nation from microbial threat—there is another possible outcome: the realization that evolution may not prioritize the human as a privileged life-form, after all.⁴⁴

Rethinking infection as affective sympoiesis—or even symbiogenesis, the development of a new species over time through the merger of two genomes—poses high urgency for the at-least-330,000 people who contract new cases of Lyme disease in the United States each year within a political climate that denies the possibility of chronic Lyme infection.⁴⁵ It also has much broader implications. Liberal individualist philosophical traditions have imbued scientific and aesthetic knowledge with humanist narratives of self-possession in which the subject coheres over time through its accrual of sensory and emotional experience. Since the age of Enlightenment, the capacity to absorb sensation, particularly pain, has been key to qualifying a body—whether fetus, adult, or animal—as a self-coherent individual deserving of political rights. Yet spirochete illness highlights an emergent understanding of the centrifugal nature of subjectivity in which it is through the very impossibility of self-possession that sensation, mediated through microbial symbioses, produces the subject. Entanglement with spirochetes makes particularly salient how new, microbial notions of subjectivity and personhood are unfolding in the contemporary moment in which the nervous system and sensory experience are elements of a multispecies choreography that exceeds the spatiotemporal purview of the singular self.

The microbial self has the potential to challenge a long political tradition. Since the age of Enlightenment, the ability to possess and

absorb sensory experience has been key to qualifying an individual for political rights. Throughout Western philosophy, command of the sensorium has traditionally served as key criteria for subjectivity—whether one refers to John Locke’s theory of sensation as self-constitution over time through sensory impressions, a process of absorption and incorporation of which he deemed only the civilized races capable, or to policy criteria that identifies a species’ ability to feel pain as the basis of its legal rights.⁴⁶ The history of chattel slavery in the United States is similarly a history of the denial of sensation and sentience, and therefore subjectivity and literal self-possession, to those of African descent. Pain has regularly qualified a subject for life, whether plant, animal, human fetus or adult. Yet presently, this solitary-self paradigm, in which the individual is in full possession of sensory faculties, is falling apart. The rhetoric of the liberal individual is a colonial fantasy of anthropomorphic exceptionalism. The microbial self suggests that sensation and perhaps emotion do not pertain to the subject but rather emerge from the friction of symbiotic relations. The capacity for sensation may not be the criteria of the rights-endowed subject but the result of an ongoing entanglement in which self-possession is impossible.

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NOTES

1. “Post-Treatment Lyme Disease Syndrome,” Centers for Disease Control and Prevention, last reviewed March 4, 2015, <http://www.cdc.gov/lyme/postlds/>.
2. Michael Specter, “The Lyme Wars,” *New Yorker*, July 1, 2013, <http://www.newyorker.com/magazine/2013/07/01/the-lyme-wars>.
3. Ed Cohen, *A Body Worth Defending: Immunity, Biopolitics, and the Apotheosis of the Modern Body* (Durham, NC: Duke University Press, 2009).
4. Øystein Brorson et al., “Destruction of Spirochete *Borrelia burgdorferi* Round-Body Propagules (RBs) by the Antibiotic Tigecycline,” *Proceedings of the National Academy of Sciences of the United States of America* 106, no. 44 (2009): 18656.
5. Lynn Margulis et al., “Spirochete Round Bodies Syphilis, Lyme disease and AIDS: Re-surgence of ‘the Great Imitator’?,” *Symbiosis* 47, no. 1 (2009): 57.

6. Eva Hayward, "Cat's Cradle: AIDS, *Toxoplasmosis Gondii*, and Impurrrfect Love," *Antennae* 37 (2016): 107.
7. B. S. Coyle et al., "The Public Health Impact of Lyme Disease in Maryland," *Journal of Infectious Disease* 173, no. 5 (1996): 1260–62.
8. Cohen, *Body Worth Defending*.
9. Ruth F. Itzhaki et al., "Microbes and Alzheimer's Disease," *Journal of Alzheimer's Disease* 51, no. 4 (2016): 979–84. This editorial supporting the microbial-biofilm theory is signed by thirty-one global dementia experts.
10. Margulis et al., "Spirochete Round Bodies," 52.
11. Lynn Margulis and Dorion Sagan, *Acquiring Genomes: A Theory of the Origins of Species* (New York: Basic Books, 2003), 12.
12. Margulis and Sagan, *Acquiring Genomes*, 153–61.
13. Margulis and Sagan, *Acquiring Genomes*, 155–57.
14. Margulis et al., "Spirochete Round Bodies," 54.
15. Elizabeth A. Wilson, *Psychosomatic: Feminism and the Neurological Body* (Durham, NC: Duke University Press, 2004), 36.
16. Laura Salisbury and Andrew Shail, eds., *Neurology and Modernity: A Cultural History of Nervous Systems, 1800–1950* (New York: Palgrave Macmillan, 2010).
17. Elizabeth A. Wilson, *Gut Feminism* (Durham, NC: Duke University Press, 2015), 14.
18. Wilson, *Gut Feminism*, 5.
19. Wilson, *Gut Feminism*, 176.
20. Denise Ferreira da Silva, *Toward a Global Theory of Race* (Minneapolis: University of Minnesota Press, 2007).
21. Kyla Schuller, *The Biopolitics of Feeling: Race, Sex, and Science in the Nineteenth Century* (Durham, NC: Duke University Press, 2018).
22. Donna Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Durham, NC: Duke University Press, 2016), 58.
23. Haraway, *Staying with the Trouble*, 63.
24. Haraway, *Staying with the Trouble*, 98.
25. Haraway, *Staying with the Trouble*, 63.
26. Hayward, "Cat's Cradle," 117.
27. "Mind Your Brain Health!" *Lyme Disease Research Database* (blog), March 2012, http://www.lyme-disease-research-database.com/lyme_disease_blog_files/lyme-disease-brain-fog.html.
28. Michele L. Pearson et al., "Clinical, Epidemiologic, Histopathologic and Molecular Features of an Unexplained Dermopathy," *PLoS One*, January 25, 2012, <http://dx.doi.org/10.1371/journal.pone.0029908>.
29. L. Roncati et al., "The First Investigative Science-Based Evidence of Morgellons Psychogenesis," *Ultrastructural Pathology* 40, no. 5 (2016): 249–53.
30. Marianne J. Midelveen et al., "Exploring the Association between Morgellons Disease and Lyme Disease: Identification of *Borrelia burgdorferi* in Morgellons Disease Patients," *BMC Dermatology* 15, no. 1 (2015), <https://bmcdermatol.biomedcentral.com/track/pdf/10.1186/s12895-015-0023-0>.

31. The assemblage of entities resulting in chronic Lyme disease often also includes heavy metal poisoning, a condition more integral than exceptional to life in late capitalism. Heavy metals are themselves a potent force in shaping affective life, as Mel Y. Chen renders memorably in “Toxic Animacies, Inanimate Affections,” *GLQ* 17, nos. 2–3 (2011): 265–86.
32. Debra Cassens Weiss, “Alleged Church Gunman Suffered from Lyme Disease, Lawyer Says,” *ABA Journal*, March 10, 2009, http://www.abajournal.com/news/article/alleged_church_gunman_suffered_from_lyme_disease_lawyer_says.
33. Pamela Weintraub, “Chimp Attack: Can Lyme Explain It? Forbes Wants to Know,” *Psychology Today* (blog), March 7, 2009, <https://www.psychologytoday.com/blog/emerging-diseases/200903/chimp-attack-can-lyme-explain-it-forbes-wants-know>.
34. Jessica Bernstein, “Did Adam Lanza Have Lyme Disease?” *Counterpunch*, January 11, 2013, <http://www.counterpunch.org/2013/01/11/did-adam-landa-have-lyme-disease/>. The claim that Newtown teachers are asked to report possible Lyme cases via psychiatric presentation has been made by Dr. Bernard Raxlen. See Valerie Andrews, “Can a Tick Bite Drive You Crazy?” January 2004, <https://madisonarealymesupportgroup.com/2015/10/18/psychiatric-lymemsids/> (blog), accessed June 10, 2018.
35. Neel Ahuja, *Bioinsecurities: Disease Interventions, Empire, and the Government of Species* (Durham, NC: Duke University Press, 2016), 8.
36. Margulis et al., “Spirochete Round Bodies,” 55.
37. Javier A. Bravo et al., “Ingestion of *Lactobacillus* Strain Regulates Emotional Behavior and Central GABA Receptor Expression in a Mouse via the Vagus Nerve,” *Proceedings of the National Academy of Sciences of the United States of America* 108, no. 38 (2011): 16050–55.
38. Kath Weston, *Animate Planet: Making Visceral Sense of Living in a High-Tech Ecologically Damaged World* (Durham, NC: Duke University Press, 2017), 8.
39. Weston, *Animate Planet*, 32.
40. Michael Pollan, “Some of My Best Friends are Germs,” *New York Times Magazine*, May 15, 2013, quoted in Weston, *Animate Planet*, 15.
41. I riff here on Mark Epstein, *Thoughts without a Thinker: Psychotherapy from a Buddhist Perspective* (New York: Basic Books, 2013).
42. Neel Ahuja, “Intimate Atmospheres: Queer Theory in a Time of Extinctions,” *GLQ* 21, nos. 2–3 (2015): 372.
43. “Zoonotic Diseases,” Centers for Disease Control and Prevention, last updated April 2, 2018, <http://www.cdc.gov/about/facts/cdcfastfacts/zoonotic.html>.
44. On the integral role of the management of microbes in imperial biopower, see Ahuja, *Bioinsecurities*.
45. Christina A. Nelson et al., “Incidence of Clinician-Diagnosed Lyme Disease, United States, 2005–2010,” *Emerging Infectious Diseases* 21, no. 9 (2015), <http://dx.doi.org/10.3201/eid2109.150417>.
46. The UK Animal Welfare Act of 2006, c. 45, for example, excludes crustaceans and cephalopods from protection, on the grounds that they are incapable of feeling pain; see <http://www.legislation.gov.uk/ukpga/2006/45/contents>.