



Atrophy and the Subterranean Microbiome

By Lee Cicuta

I've had some serious questions about my body's ability to balance itself— my legs' collective ability to carry me through space—for several months now. I cannot tell you just how long. This is partly because some capacities can fall away from you so gradually that you hardly notice them going at first: sand draining out from a tiny hole in your pocket, emptying faster every time you have to run. I've had to run many times. The first time my determination to disrupt finally outpaced my physical ability to get away from retaliation some cops picked me up and slammed me bodily into the pavement. They tore the labrum in my shoulder in the process, which required surgery but would not get it until a year and a half later. I wonder how much sand fell out of my pocket then.

Perhaps it is becoming clear that there may be other reasons still I can't tell you when my legs started to go weak and wobbly on me. When multiple structures within a larger system are declaring crisis, the exact timbre of another one setting off can be hard to catch. When did anything in my body “start” to go wrong, wrong enough to scream over the compensation the rest of my body deployed to maintain a semblance of normality for the whole?

all else of the terrible promise that seems to come with every new symptom of physical decline: that what you lose may never come back, that the immensity of this loss is itself a prelude to bigger and more profound loss that can never be prepared for and may never be fully illuminated. Trembling in the continued proof that I cannot fully predict, understand, or manage the symptoms of my body's atrophy. The damage to the microbiome of a cave and the damage to the microbiome of a human body may be something the organisms within may adapt to and find paths to survival. Or they might not.

Many biomes, exposed overmuch to the violence of contagion and coercive contact, die with a finality.

Fluids dry.

Entire histories are plunged into to a lasting, rendering, silence.

I went into a cave and despite all of these attempts you see here to make meaning of the experience in the aftermath, when I was there I was in equal parts in awe of beauty that develops in harsh conditions and terrified of my ailing, failing body. It seems important for me to end this narrative by pulling back from the philosophy and poetics to emphasize the raw materiality that conditions them. I don't know when my balance started deteriorating, nor how long my legs' ability to carry me through space has been degraded, nor why. I can tell you that at one time in my life—and that time seems to me both an ocean and a kiss's distance away from me now—I wouldn't have noted anything particularly challenging about physically navigating that space. Entering it at this time of my life made me afraid. Afraid of falling and aggravating an old injury or collecting a brand new injury that will require intervention at a time where I am already overtaxed by my near constant contact with the medical industrial complex. Afraid of doing further harm to the environment than the violence of my presence already implied. Afraid of calling the attention of the other tourists, the tour guide, upon my small group of trans people wearing N-95 masks in a dark hole in the rural Midwest. In honestly, afraid above

When can I say disability “began” for me when I see the threads of it, now, running clear and vivid pink through my whole life's history? When did my legs stop holding me up correctly? Well, it's hard to say when by some standards they are holding me up “correctly” still. Can I go for a walk? Yes. No. It depends on the walk really. Can I immerse myself in deep forest? I hope so. I *want* to. I can if it's not too far. Not too high. Not so deep, after all. Can I enter and take in the striking and alien beauty of a cave? If the tour is short? If its floors are sufficiently destroyed and repaved and made more level for better access? If there's only just a few stairs? Maybe?

There's a cave in the Midwestern region of the so-called United States that multiple trans people were heading into and I wanted to be among them. I really thought I could be without too much trouble. I researched what I could about accessibility beforehand. The official website places its accessibility information behind a barrier—“email us for details!”—but disabled people wrote about the cave tour in online park forums. It was less than a mile long, had relatively little elevation change (no long or steep staircases!), a rough

concrete path with good traction, and just a few tight fits and low hanging ceilings. I knew it would exhaust me and exact a steep price for indulging my adventurous impulse, but one I thought I could anticipate the dimensions of and thus felt prepared (as much as one can be) to pay. I didn't account for balance—and my increasing lack of it—at all.

Caves are extreme desert environments. They are sustained by the filtered nutrients from surface life far above and are incredibly sensitive to the impacts of external intervention. When they are properly alive, they stink of shit and decay like any healthy ecosystem should. It is only so obvious in a cave because it is enclosed from the rapid flows of the gaseous ocean we spend so much time breathing in on the surface. In a living cave there are stretches of totalizing silence, but this silence may be ruptured by the chattering of bats, skittering rodents, an ambiguous flap of wings, perhaps a lingering echo before the walls bring all to quiet once again. Beyond the creatures that can register easily to human senses are those who have successfully made a home for themselves in every environmental niche on Earth: microbes. Each individual formation of rock within the cave, each

ze was 65. It seems advocating for total remove, complete alienation, an end to human relations with the subterranean is too easy, too violently reductive in its own way.

I'm feeling desperate need in the presence of damning excess. I'm demanding accessibility while being an occupier of stolen land: an inheritor of *too much* access. I need more resources. I need to be further impoverished. As atrophy prevails (and how long will it prevail? until tomorrow? until next year? until death?) I am able to do less and less. In my further marginalization, I gain more intimacy with the infinite nature of my debt to others and how much *labor* and *action* is demanded of me by the crushing, immense reality it. The more I think about how I can best leverage these dwindling resources of mine into meaningful forms of disruption, the proper aim seems less and less to be in achieving an able-bodied sense of stability and direction—its promise ever-fleeting, temporal, mortal—and more in finding ways to express agency and integrity while always tipping in some manner out of balance. Out of synch. Out of legibility. Out of alignment with the planned tour.

straightforward path that sometimes seems to cohere in tender promise before my eyes and yet slants away beneath the more material demands of my feet. My increasing dependency on the medical industrial complex—an industry whose resources are extracted, like that of every major industry, from the institutional maiming of the marginalized and colonized peoples of underdeveloped countries in order to the maintain (relatively) healthy consumer bases in overdeveloped ones—also induces this sensation. In this realm the cave's microbiome speaks up again: microbes that thrive in extreme environments protected and isolated from animal contact can and do help humans develop new antibiotics. This is something that must continuously be done as harmful microbes develop tolerances to the antibiotics we already have. Last month I found a vivid red circle around a tick bite and ten days of antibiotics is what saved me from developing a dangerous tick-borne infection. Just last year I wrote an essay (Butch Ability) about Leslie Feinberg and how his structural lack of access to proper treatments resulted in ze struggling with the escalating symptoms of multiple tick-borne illnesses until those illnesses, exacerbated by medical neglect, killed Feinberg when

an island from the other, is a unique microbiome that is home and entire world to microbes that may have no others like them in all the larger universe beyond the boundaries of their lone stalagmite. Even a passing touch of human skin on one of these formations can transfer tissues, hairs, and oils that can and do change the course of these microbes evolutionary history irrevocably. Such a touch can even represent the start of an extinction level event. The minerals that drip from above that give cave rock formations their incredible shapes over the process of thousands of years may cease to cohere. Does it matter to them whether the world-ending asteroid was due to chronic inattention, an uncontrollable lack of balance, or the product of malicious intention? I think nothing matters so much to them as the impact of the touch and the following disaster of contagion.

I went into a cave that I don't believe was entirely alive, but nor could or should it be declared dead. The visible living things that could potentially disrupt or disgust tourist sensibilities seemed to be quite removed. Whether this was by plotted intention to dispose of them or the straight-forward impact of paving a path through a cave and filling

it with bright lights and large groups of people is hard to know for sure, and, further, seems a question that must accept several false premises in the asking. What is known is that every external intervention disrupts. Lights, concrete walkways, additional ventilation, human body heat and breath are not elements that a cave's ancient microbiome can incorporate with ease. All of these forms of disruption are present in this cave, but no bats. The stalactites and stalagmites are still growing, reaching for each other, rebelliously alive under fluorescent lights. Or they seem to be. Are there tiny apocalypses already happening on each one? The smoke rising from their microbial buildings might not be recognized by human sensibilities for a thousand years yet, if ever. One must do one's best to treat each rock as if it is a planet that has never heard of death and yet might be let in on the fatal secret by the brush of a shirtsleeve.

The tour guide began by telling us a story of dubious origin and, regardless of its veracity, one that has been very obviously preserved by a fevered settler imaginary. It "is said" that the Indigenous people of this land, the Osage, once performed marriage rituals in the cave and it was from them

When we finally left the cave we discovered that I—who had struggled so hard to complete that half mile—and the most athletic member of our group both had made roughly the same amount of physical contact with the cave walls. I, with the smear of green brown on my sleeve. Her, with a stain on the hip of her jeans. Her proof of contact came from a moment she couldn't recall and was an example of how the disability of neurodivergence is still and always embodied and physical, always part of one's negotiation with space. We both experienced the negotiation itself extremely differently, but the disability of inattention and the disability of physical atrophy left and took away from that place the same marks. They washed from our clothing easily. I wonder about that smear's sister in the cave. I wonder if those microbes had already learned about catastrophe by other contact before me or if I taught it to them first. I don't believe it redeems me to be the second though, nor the tenth, nor the hundred thousandth.

I am rocking around in the complexity that emerges from the reality that losing capacity effects and in some ways undermines my ability to move with intentionality. I find myself unable to traverse the

Difficult to respond to my own desire for accessibility and participation with a call to undermine the accessibility to a space for even more people. For that very reason it seems a poignant example of the importance of making sure that when we call for accessibility we're also asking "to what" and "why?" Accessibility cannot exist as its own isolated imperative. Its demands, like all demands, can only be made sense of in the political context in which they're made. My pain at my lack of access to large parts of social life that determine my existence is shaped by my marginalization as a crippled trans person. My pain at my lack of access to engage in cave tourism without fear or danger is certainly informed by the former pain and location, but also cannot help but invoke and agitate certain entitlements I feel long accustomed to as a consumer within the domain of empire. As a settler descendant expecting to be allowed to enter a relationship with a space as a distant observer and extract something for herself from it, but who instead entered a conversation with an entity that spoke back, that told her of the harsh violence in her every step even as she stumbled and whispered her meager apologies.

the cave allegedly received its name: Bridal Cave. However, our guide continued, their rituals also damaged the cave because they consistently came in physical contact with a large central column near the cave's entrance. When settler colonialists came and took over the cave, they disallowed touching the large column to make sure it remained "protected" and "preserved," but they claim to otherwise carry on this ancient tradition with the nearly 4,000 weddings they have held in the cave since its opening to tourism in 1948. As we moved from this entry chamber and further into the cave, our guide proceeded to tell us about how the settlers who made the cave into a tourist attraction used explosives to open the way for the same concrete path that was leading us further in.

The origin of the story's appearance in settler archives seems to be U.S. Colonel R.G. Scott, who purchased the land in 1894. Bridal Cave is also the title of a chapter in Colonel Scott's 1933 book titled *Indian Romances*. This chapter beings with a narrative of the Osage's tribal origins that directly contradicts the history the Osage tell of their ancestors' migration west from the Ohio River valley. Scott follows this fabricated history with a

poem another white settler wrote about the beauty of the land now called Missouri, and then finally a story of “Bridal Cave” far different from the one described by our tour guide nearly a century later. In Scott’s story, an Osage man kidnaps two women to the cave in hopes of marrying one. One of the woman throws herself from a cliff to her death, the other agrees to marry him, and their wedding ceremony is later held in that same cave. Scott claims to have been told this story by a group of wealthy Osage people who came to do some sight-seeing in the land that had been stolen from them and from which the vast majority of their people had been displaced since 1872. Where Scott himself can be found in the historical record, it seems that he was a man of many grandiose claims. In each article I found about him, he was introduced as a neighbor and childhood playmate to Buffalo Bill (a man who got his moniker for killing 4,000 buffalo in 2 years, a settler strategy used to impoverish and displace Indigenous people) and claimed direct ties to every U.S. President from Lincoln to Hoover. His book is filled with fetishization, romanization, racist caricatures, and slurs typical of a time period in which Indigenous people were being transformed in the settler imaginary from an existential threat to

more accessible with all bodies in mind seems to allow, in its own way, me to more easily naturalize an extractivist relationship with the environment. Reckoning with the risk my stumbling disabled body posed here took me first through grief and frustration at finding yet another thing that my body cannot do. Another way my body sets me apart and away from participation. I will admit that those feelings still linger powerfully, along with a growing fear about the broader implications that new evidence of further bodily decline suggests. I cried quite bitterly about them just before writing this. But I also think that such a cave would be much improved if, instead of finding a way to make it more accessible for people like me to consume, we destroyed every structure that makes having this kind of relationship to an environment possible. As much as they would have helped me, I can’t make myself wish there were more handrails embedded into that ancient stone floor. There seems to be as much for potential for violence in access as there is in its absence.

It is a strange and painful position to drag myself to when my heart is still aching for all of the caves I’ve just now learned I cannot safely visit.

This site was not an example of ‘ruins’ being ‘preserved’ but a process of active ruining: of a place being held artificially and intentionally in a stasis of ruin. Half of the ecosystem kept away by artificial light and human noise. Earth’s circulatory system choked off just beneath the skin. Life’s decay artificially forced to continue to produce beautiful rock formations but burnt out of every other organism ill-suited to human consumption. The politics of accessibility expansion are complicated by this place. Much of the infrastructure that is carved into the Earth with the stated aim to make its natural beauty more accessible to people in general tends to be, in reality, constructed with One kind of body in mind: an able-bodied white man’s body. Tourism is not a mass appeal campaign. It serves as another mechanism for keeping divergent bodies out of the public sphere and for constructing a singular image of the “public body.” That I am among the marginalized targeted to be filtered and pushed out of public spaces due to the various divergences (visible and invisible) of my embodiment is without doubt and seems to be signaled more violently with every passing year. However, following this with the conclusion that such infrastructure *must* be made

the expanding colonial project to a supposedly “extinct” or “defeated” people from whom other forms of value could be extracted and with which new settler identities could be formed. The book’s dedication reads: “*Dedicated to a Better Understanding of Human Problems.*”

I detail this context not in order to totally dispose of the very notion that this cave could have had importance to the Osage people: ritual, narrative, or otherwise. Much of what can be known about the colonized and oppressed of the past so often has to be squeezed from toxic and tainted archives. The history of archive and thus our narrations of history itself is shaped by the reality that written history—that is, history that has been recognized, recorded, and preserved for the archive—is dominated by the powerful. The destruction of the subversive archives of the colonized and other underclasses has always been the project paramount for the ruling classes. That is to say, the archive is often a funhouse mirror: one from which we *must* expect a sinister distortion but from which we still may, at times, steal subversive meaning. Perhaps the cave narrative really happened, or kind of happened, or happened in some other kind

of way, or was made up entirely by a settler who wanted to encourage tourism to an area he had large investments in. It could also be the remnants of a practical joke, or an act of intentional epistemic poisoning to resist legibility to settler knowledge formation and the extraction that always follows such formation. However, regardless of whether or not Colonel R.G. Scott ever had a real conversation with a member of the Osage Nation about the cave or whether the narrative he wrote shares any points in common with a story shared to him, the Bridal Cave story in *Indian Romances* is not an Osage story, but a settler one, and reveals the anxieties, tensions, and fetishes of settlers in the 1930s.

The transformation of the settler's story about Bridal Cave from Scott's book to the tour guide's lecture says yet more about the historical changes in settler identity formation of the last century. Scott wrote about the Osage as people who had a deep and ethereal connection to land that was "dying out" and whose alleged stories served as means for white people to connect to a fantasy of pre-history that both entertained and served as a means of constructing and maintaining themselves as "civilized." This dynamic has maintained, but

process of destruction—an ongoing history of violation—that made it possible for me to have out this struggle in the cave at all. Like in all forms of settler colonialism, apocalypse is not a singular event but a structure that requires constant maintenance. When one human comes into contact with a cave wall they not only risk destroying the tiny organisms they touch; they also leave nonnative microbes that compete against the indigenous ones. If this happens very sparingly, the indigenous population remains the most advantaged to succeed and can often recover from the initial violence of contact. The invasive microbes starve in the dark desert and die away. However, when large groups of people enter the same space over and over again we bring all the resources the colonizer microbes need to thrive and overwhelm the indigenous population, even when our bodies never touch the walls. Caves with daily tours collect upwards of 40 pounds of lint cast off from visitors' clothes every year. The organic tissues we expel everywhere we go, the lights we wire in, the warmth from our bodies and more keep invader microbes well fed in a space that would otherwise deny them their hold there.

again stop my body before it made of itself a world-ending disaster for some nearby microbes. Our guide admonished our little group for moving so slowly. We were holding everyone else on the tour back.

I clambered, tripped, stumbled, nearly fell, and caught myself again through the tour in what recalls like blurry, rapid, panicked chaos. I felt as tossed around as I have been in any mosh pit, but without the security and solidarity of others to hold me up or help me recover from a fall. The pleasurable and mutual violence of the pit rejoices in impact; a sensitive cave microbiome, however, experiences it as a violation. I thrashed around this site of both beauty and violent extraction, avoiding touch with every physical capacity I had. At times the utter lack of contact—when I could maintain it—made me feel like spacewalker untethered. At other times there seemed nothing but the immediacy and heavy matter of rock walls with not even air between them. But as hard as I worked to be individually accountable with my body in that space (and knowing that there were in fact countless tourists who have, are, and will be much less careful or attentive to the violence of their touch) there was still no avoiding the reality that it was, in fact, the

demonstrates new contours in the tour guide's story told in 2025. This popular tourist and wedding destination has jettisoned Scott's grizzly story of kidnapping and suicide (much more obvious with its racism and not very romantic or family friendly) *along with* his coinciding claims that the Osage knew this land more intimately than settlers ever can on their own. Now is spoken this new story with no record I can find outside of my hearing it from the guide. In this narrative, intimate ownership of the land and true stewardship over its wellbeing is awarded to settlers who "preserve" it from the "damage" the Indigenous people were allegedly doing to it. In this story, the Osage are valuable simply for setting a ritual precedent that settlers can (pretend to) imitate for their own spiritual wellbeing and to acquire social status. The message today: Indigenous people were naively damaging this cave until settlers put a stop to all of that with bright lights, dynamite, and tourism. Don't we all feel glad to be a part of that? Aren't we glad that we are here today to benefit from such impeccable settler preservation practices?

Moving into the cave this way and bringing with me, as always, relentlessly distracting pain, I found

myself quickly filled with a heavy and somber awe. The formations of the cave were incredible, reason defying, utterly beautiful and strange. I rarely connect the rocks of the surface world with living things and all their accompanying metaphors, but below the earth their connection to the fluidic processes of life and death is made more visible. The nitrogen of life's decay is filtered down through layers upon layers of dirt and stone to drip slowly from stalactite to stalagmite, growing barely ten centimeters of new rock with the passage of every thousand years. Building monuments of stone to mark the passage of Earth's long forgotten dead, down in the dark. Inhabiting a disabled body that is its own kind of living monument to atrophy while moving amongst decay's most ancient records was quite striking to me from the start. I found myself at first getting a little romantic about this and then cynically wondering how much it could really redeem one to be filtered into a stalactite eventually. I have experienced steady bodily decline over the last six years of my life and still lack solid answers for what is happening to me. Romantic notions of death taste different when you aren't quite sure that you don't feel it breathing—large, stinking, and absolute—down the back of your neck.

The big problem soon became apparent and then of course it became worse. I had been noticing a growing and seemingly unavoidable swerve to my step but had not found an occasion, until the cave, to test and observe it. I had thought about the weakness in my legs—I have already had to dial back walks and take flights of stairs quite slowly—but I thought the length of the trek, the lack of big sets of stairs, and textured floor would make the trip doable for me. I didn't consider that the swerves I've been noticing on my walks on wide pathways would become unmanageable and extreme in the confines of the narrow and uneven cave path. I didn't think about how my increasing tendency to tip into doors and walls I attempt to pass would, in the fragile microbiome of a cave, be a dangerous threat to the small beings still living there. As my legs quickly tired, the problem became more dramatic. I would tell my body to move straight through a passage and yet quickly found myself careening towards the right wall. In catching myself from touching it, I'd end up flailing again towards the left. Handrails in this cave were scarce: they expected visitors there to be able to hold themselves up and back. I was always running, catching, stumbling over myself, desperate to yet