IN THE COMPANY OF CATERPILLARS:
LESSONS ON LANGUAGE AND LIFE FROM INSECTS

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BY

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LAY ABSTRACT

This sandwich thesis takes another species—fall webworm caterpillars—as a guide and teacher. It follows critical questions that emerged from (1) my relationship with these creatures and (2) my analysis of local texts that reference fall webworms and their lifeways; it thus describes how these creatures' lives are described and narrated and how such narrations shape the possibilities for cross-species relationships. More specifically, its three sections focus on naming non-human communities, feelings of disgust associated with insects, and possibilities for reading non-human traces. As this research is firmly rooted in the Great Lakes region, it frequently engages with and critiques the settler colonial knowledge systems that have been imposed on local creatures, including fall webworms. Nevertheless, this research is not defined by human categories; it crosses between genres and academic disciplines while tracking the influence of another creature and dwelling in the possibilities for more respectful relationships.

ABSTRACT

This sandwich thesis takes another species—fall webworm caterpillars—as a guide and teacher, and it follows the critical questions that emerged from my relationship with these creatures and my analysis of local texts that reference them and their lifeways. Thus, the research questions explored here are defined by another creature's influence and entanglements. Webworm caterpillars' relationship to diction and storytelling are particularly prominent in this work, though it also engages with the caterpillars' relationship to western science and popular culture.

This research is arranged into three parts or research papers. The first considers how non-human communities are named; it investigates the word "colony" in relation to social insects. After critically examining some of this word's connections to colonial geographies and evolutionary biology, it suggests that readers refrain from casually referring to insect collectives as "colonies." The second paper focuses on the feeling of disgust and the supposed disposability of insect lives. It also analyses how some conservation groups have approached disgust in the past, and it encourages readers to lean into their uncomfortable feelings as they build relationships with other creatures. The third paper looks at the practices of reading and writing, and it acknowledges that our definitions of these terms have often been entangled with humancentric and Eurocentric worldviews. In an effort to reimagine cross-species relationships in a way that encourages peace and respect, this paper invites readers to broaden their understanding of literary practices to include non-human traces.

Collectively, these papers represent an effort to learn from another species, an imperative echoed across the Environmental Humanities and Animal Studies, and one which requires me to grapple with my position as a settler scholar. It thus opens critical questions about how oft-reviled creatures are narrated across communities, and it encourages readers to engage in more respectful storytelling practices.

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For me, this PhD does not simply mark an academic achievement or five years of study. Instead, it has been the groundwork that enabled five years of growth, most of which appeared in a whirlwind, leaving me breathless time and time again. In truth, I am still trying to catch up. And yet, these past five years have also been the best of my life; I leave them behind with grief. I also leave them behind as a much happier, healthier, and kinder human.

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DECLARATION OF ACADEMIC ACHEIVEMENT

All parts of this thesis were written by Janice Elaine Vis. Where relevant, they have been reproduced with permission from their copyright holders:

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Introductions, Stories, Worlds, and Webworms

First, introductions.

Can we begin with fall webworm caterpillars? We'll be thinking with these critters quite a bit, so we'd best go over a few basics: fall webworm caterpillars are moth larvae who live in the Great Lakes region. Around here, one generation hatches every year, usually in mid to late summer. Webworm eggs are laid in trees, so when the caterpillars come into the world, they're surrounded by nutritious and delicious foliage. They hatch in packs, dozens of larvae entering the world at once, munching down on tree leaves together. As they eat, they grow: webworms can grow to about three and a half centimeters, their bodies covered with black and ivory bristles.

But it's a dangerous thing to be a little caterpillar in a forest. There are birds, wasps, and other insect predators who are hungry. The caterpillars' spiny exterior may ward off some potential predators, but others won't hesitate to swallow down these small critters—bristles and all. But the caterpillars don't wait around to be eaten. They've come up with a clever survival strategy. Together, the newly-hatched caterpillar community weaves a dense silk web around their food source. The web is a protective barrier, and as long as they stay under the web, the webworms can eat the leaves in relative safety. Once all the greenery underneath the web has been eaten, the caterpillars expand their silk creation: at first, only a few leaves are covered, but by summer's end, whole branches can be encased in a thick, rather messy-looking weave.

But the larger the web, the more likely the caterpillars will capture the attention of humans, not all of whom are thrilled to see the gauzy webs—a point we'll return to later.

Janice Vis, *Fall Webworm Caterpillars on Mulberry Leaf*, 2024.

Fall webworms captured my attention when I moved to this region in 2020, and I've spent a lot of time with these critters over the past few years. I was interested in biological facts about the caterpillars—their life cycle and habits, for example—but I wanted to know more. I wanted to know how they circulated through culture, how they shaped the lives of humans, how their aliveness vibrated across networks of trees and ecologies of language. In short, I wanted to understand something of webworm worlds, and I wanted to know how they fit into my world. This meant I had to look for webworms' stories: as Cherokee scholar Daniel Heath Justice explains, stories have a profound effect on our understanding of the world, and they can "give shape, substance, and purpose to our existence."[1] Stories show us how our worlds work—or how they might work—for good or for ill, and they help us understand how our lives matter. Some stories show us how to "uphold our responsibilities to one another,"[2] helping us to be good siblings, parents, friends, and webworm-neighbours, but others obscure those responsibilities. Either way, stories hold power. But stories don't come from nowhere: the conditions of our lives shape the stories we tell. Cultures, communities, and ecologies all have their own stories about how things work, about who we ought to be. They also offer context to help us understand those stories. I live in a nation dominated by settler colonialism in a time of ecological collapse; I live by a beautiful lake and have access to many revolutionary writers. There are a lot of stories

1. Daniel Heath Justice, *Why Indigenous Literatures Matter* (Waterloo: Wilfrid Laurier University Press, 2018), 2.

2. Justice, 2.

around that are invested in different worlds. I often return to the words of Donna Haraway: "it matters what stories make worlds, what worlds make stories."[3]

And so, I went looking for webworm stories and story-worlds. I perused local newspapers, guidebooks, bits of poetry, and research reports from various academic fields. I tracked the development of webworm webs near my home, spending hours sitting under their webs. All the while, I kept a few questions in mind: What stories are told about these creatures and where do these stories come from? How have webworms woven themselves into stories about this place? What might any of these stories have to teach me about the world I inhabit? What worlds might be possible if these stories were told differently?

The questions are intentionally open-ended. I wanted my research to grow from my relationship with webworms, rather than having a rigid set of prompts predetermine what I learnt from these creatures. And while my relationship with them is far from finished, my efforts have led to the development of three research papers, enclosed in the following document, presented in the order that they were written. These papers can be read individually, and I hope they offer insights into their respective areas of study. But they can also be read together; they share a context, a world. And I agree with Haraway—"it matters what worlds make stories."[4] And so before introducing the specifics of my research papers, I think it's worth pausing to say a bit more about stories, about worlds, and about some of the worlds that enabled these papers to take shape. In other words, there's more introducing to do, more stories to tell.

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3. Donna Haraway, *Staying with the Trouble* (Durham: Duke University Press, 2016), 12.

4. Haraway, 12.

Janice Vis, *Fall Webworm Nest Covering Branch*, 2023.

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When I was a young girl, perhaps ten years old, my mother told me a story. It goes something like this:

> *Imagine you're walking down a street, lost in thought, not going anywhere in particular. And then, maybe half a block away, you see there's a door, slightly ajar, and you decide that you'd like to go through this door. And so, you pick up your feet, hasten your pace. You arrive; you open the door; you enter. But as soon as you walk through the door, you realize something important. While you were still walking down the street, someone had*

called your name—someone from inside of the door! You must have heard it, but your conscious mind hadn't fully processed the information, not until after you'd left the street and crossed through the door. So: was it really you who decided to enter the door? were you—maybe—simply instinctively following someone else's prodding? (The answer to both questions is yes.)

My mother was the daughter of post-war Dutch immigrants and a staunchly religious woman, and she told me this story to illustrate the Calvinist doctrine of predestination—that is, the belief that select souls are chosen by God to find salvation (and others are not.) She was no theologian, but, according to my mother, understanding predestination required holding two truths at once: a person makes the decision to follow God (or does not), and that person has been led to that decision by God himself. The choice is simultaneously individual and divine; it would be wrong to deny personal responsibility, just as it would be wrong to ignore the influence of the all-powerful deity.

To be clear: predestination is an extremely exclusionary doctrine. It invites hierarchal thinking between the chosen and the unchosen, and it assumes that many people will suffer forever in hell for being on the wrong side of that choice. I do not embrace my parents' religion, and I have no interest in their heavenly ambitions. But I've always remembered the story about the door because it gives me a framework to grapple with the complexities around agency and, more specifically, the necessity of holding space for both personal accountability and systematic forces. We all make decisions, and we must take responsibility for them—this matters. But we are also set up to make certain decisions—this also matters. We are prodded down different pathways by cultural norms and family expectations, steered one way or another by the resources

that we can (or can't) access. We are given some stories; we aren't given others. I was given a story about a door. I didn't choose that story, but I have chosen how to hold that story, what lesson to take from it, and how to pass it along.

Still, sometimes I wonder if it's ok to pass this story along because "it matters what worlds make stories,"[5] and I don't have much good to say about the world this story came from. And yet, when Haraway says that stories' roots matter, she's not saying that stories are doomed to recreate the worlds that created them. Stories come from worlds, but they also respond to those worlds—sometimes to critique them, to destroy them, or to try and grow something else out of them. Haraway advises me to pay attention to these world-makings. And so, when I think about the door story, I think about the world it came from, about how it functioned in my mother's world, and I also use it to understand the world differently. For me, the story offers an opportunity to think critically about positionality, about access, about how I make choices. It also invites me to consider the voices who may have guided me. And so the story becomes my own, even if it is not entirely my own. Again, I make decisions, claim agency and ownership over my life, but never in a void.

All the stories I have—including the ones recounted in the following pages—are subject to the same entangled bits of agency: inherited worlds meet ongoing world-makings. I've been given stories that tell me how to think, what language to use, and which creatures to value. Some of these stories are popular, some are not, and sometimes these stories clash with each other. Still, I read and write about these stories to understand and to reimagine webworm-worlds in all their contradictions.

5. Haraway, 12.

In this way, my research papers are formed through my own decisions and through conditions that exist far beyond me. These papers were written because webworms decided to act a certain way, because other people chose to notice them though particular stories, and because I had access to these stories. I can decide how I want to pass along these stories—but I still make storytelling decisions within the conventions of a language that pre-existed me, using the technology and education made accessible to me, following scholarly standards that I may or may not agree with, all while keeping my musings within a strict word count. They're my stories, but they're not only my stories. And I can—and should—be held accountable for them.

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My research papers—or research stories, perhaps—emerged from my relationship to webworm caterpillars, but they also remain rooted in the world of academia. More specifically, these papers were written during my time as a doctoral student in the department of English and Cultural Studies at McMaster University, and I could not have completed them without research grants or the support from professors and mentors. Nevertheless, because of this context, I have written them to adhere to the conventions of humanities research articles. These conventions have their merits, but they also become gatekeepers for who gets to do research, how that research is presented, and what counts as "real" research. Citations represent one of the clearest examples of academic literature's limitations. It is easy for me to quote Haraway, but how do I cite my mother's story? Or the influence of a webworm nest? I think here of Justice's assertion that "Indigenous traditions teach us that… [non-human] peoples have their own story traditions too,"[6] but there is no structure in Chicago, MLA or APA to credit their knowledge. When academia is the world that creates stories, only certain storytellers can be named.

6. Justice, 38.

But even as my research remains tied to the academy, it also responds: at times, my research challenges the format of a traditional literary study. This is, in part, because my work is inspired by Habitat Studies, an unconventional methodology taught and practised by Canadian scholar Laurie Ricou. Rather than focussing on a particular time period (like "19th century lit") or nationality (like "Canadian" lit)—both conventional fields of study—Habitat Studies centers a non-human species. The parameters of study are the boundaries of the species' habitat and influence; practitioners are encouraged to seek out references to their species in many different genres, including the hard and soft sciences, popular literature, and other kinds of media representations. The cross-disciplinary and multi-genre nature of Ricou's methodology makes it ideal for considering the intersections between stories and world-makings. "How is [a] species written?" asks Ricou.[7] "How is it read? How does language—which after all might be understood as an ecology, an intricate system of interdependencies—signal connections within and among species?"[8] These are questions I regularly ask myself about webworms. Across my research papers, I wonder how different genres and communities present these creatures; the differing language used in entomological research, newspaper articles, popular science, and environmental movements reveals different world-making projects. Unpacking these projects is a central focus of my work.

Still, like most academic methodologies and structures, Habitat Studies is not without its flaws. Ricou, for example, suggests this methodology might reveal a "regional culture" rooted in

7. Laurie Ricou, "Out of the Field Guide: Teaching Habitat Studies" in *The Bioregional Imagination* (Athens: University of Georgia Press, 2012), 352.

8. Ricou, 352.

the lives of non-humans,[9] but does so without acknowledging Indigenous cosmologies, who have long made similar statements about the organizing and creative traditions of non-humans. Habitat Studies may also be too reliant on the Linnaean taxonomy, which names and categorizes species. While useful for swiftly organizing information, this taxonomy is not neutral or objective. Much has been written about the Eurocentric lens of Natural History, which worked to categorize plants and animals in a supposedly universal system that allowed them to be turned into commodities; I critique this system more directly in Part One of this work.

To me, Habitat Studies does not represent a perfect theory but a useful practice to begin to pay attention to another creature and their stories. I name this methodology because it was a significant influence in my research, especially in the initial stages. Still, the final forms of my research papers don't look much like a Habitat Study. I found myself drifting from the methodology because, at some point, I became less interested in presenting webworm caterpillars as the subject of my research and more interested in listening to them as teachers. Sometimes, they were teaching me directly about themselves, but other times they were teaching me about forces, affects, or relationships that were part of their world. So, unlike a Habitat Study, my research papers are not really about webworms themselves; instead, they follow critical questions that emerged once I started to take notice of webworms. Like the voice in my mother's story, these caterpillars called me into certain lines of inquiry when their presence intersected

9. Laurie Ricou, *Salal: Listening For The Northwest Understory* (Edmonton: NeWest Press, 2007), 2.

with my senses. We entered each others' world—not as blank slates, but carrying habits and histories that predated the other. We became part of each other's stories.

Janice Vis, *Fall Webworm Nest with Tangled Thread*, 2024.

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Within western society, the myth of objectivity still exists; in academia, this myth suggests that research ought to remain distinctly impersonal. I disagree; each of these papers includes conventional literary analysis, but they also share an investment in personal narrative that recount how certain questions, scenes, forces, came to the fore for me. I write about flipping through books, sitting under trees, and visiting webworms at night. These stories may feel

repetitive to a reader reading the papers one after another; still, I hope they offer readers with an accessible and engaging entryway into the research. These stories also fulfill a more theoretical commitment; to me, weaving together personal stories and research narratives is not just a creative exercise—it is central to my research. I am embedded in cultural stories, personal histories, and place-based relationships that shape how I encounter and interpret knowledge: if I want to write about my relationship to another creature, I must consider my interactions with a broader network of forces and agencies who inform and influence my understanding, even when they don't fit into a standard citation.

As the Salish writer Lee Maracle wrote, "No thought is understood outside of humans' interaction with one another, their condition, and their environment."[10] Book research does not exist in an alternative dimension from other kinds of knowledge-gathering practices. Walking through the woods was just as important to my learning as reading Haraway's *Staying with the Trouble*. To separate these two encounters is to fail to account for how research really happened—and why it might matter.

Despite the persistent myth of objectivity, some academic conventions are shifting toward acknowledging situatedness of knowledge. Working within the humanities, I regularly see the myth of objectivity named and disavowed. Researchers are increasingly including statements about their positionality and identity that affect how they interact with knowledge. These statements aren't exactly stories about the researcher's journey to knowledge, and in some cases, they may be empty gestures. Still, they name some of the relationships that a researcher has to systems or power. My own positionality statements emerge in each of the enclosed research

10. Lee Maracle, "Oratory: Coming to Theory," *Essays on Canadian Writing* 54 (1994): 9.

papers as well; I see these statements as connected to the personal anecdotes. They are another way that I acknowledge the relationships that created the conditions for my work and continue to influence my writing. In the end, my ability to see and think with webworms—and the reasons that they came to my attention in the first place—are all very much entangled with who I am.

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More introductions, then. I think it's my turn.

I am a cis white woman, a settler, a writer, and a grad student. I am currently housed and well-fed in the city of Hamilton, Ontario, which is located on the traditional territory of the Haudenosaunee and Anishinaabe. I was not raised here; I am not from here. My childhood was chaotic and mobile, and I am not sure that I can claim to be from any place in particular. I can speak to other matters with more certainty: I was raised in a high-control, fire-and-brimstone version of Christianity. My father was an unstable preacher who had a habit of falling into terrifying rages. He also taught me to be suspicious of wealth and critical of powerful institutions. My mother was an evangelist for Jesus and the Patriarchy. She taught me to love plants and gave me a story about a door. I am not on speaking terms with either of them—a longer, sadder story.

Grad school was not my expected path: I didn't know anybody who'd gone to grad school, didn't know how the system worked or what it might do for me. But at twenty-three, my life had reached a crossroads. I was chronically ill with no diagnosis, living with pain and no hope for relief. Panic attacks were a normal occurrence. More troubling, I had started sleep walking: I would get up in the middle of the night and, in a half-conscious trace, write insults all over my body: *Slut. Whore. Dirty.* I'd always been interested in words, in their power and possibility, but couldn't talk about those ones yet, couldn't admit that I was being sexually

abused, couldn't leave the man who was doing it. Where would I go? But I needed to go somewhere, to do something; I felt a tremendous urgency in my body. I suppose I'd always felt safer at school than at home, and so grad school felt like a place I could go, a door I could open.

I don't tell this story to elicit shock or pity, but rather because the events transpired in the following years—coming to terms with sexual assault, escaping a dangerous man, navigating a PTSD diagnosis, recovering from chronic illness—these are the ever-present but unspoken backdrop to my research and writing. It was crisis that led me to pursue graduate studies; I was working through crisis while I was working through a PhD program, sitting under a tree, wondering what caterpillars could teach me about being human.

I often wonder about the intersections between my life's events and my research: perhaps I was drawn to the environmental humanities because of its emphasis on respectful relationships. Perhaps Ricou's focus on the local, material entanglements felt grounding at a time when I felt profoundly dissociated from my body. Perhaps I was looking for connection, and animals felt like safer companions than humans. Perhaps I was drawn to the hated creatures—creatures who were ugly and misunderstood, much like webworms—because I hated myself, hated my life. Or perhaps the creatures of the forest could tell I needed help, and so they reached out, and some part of me responded. Although I came to this region hoping to write about non-humans, I did not come looking for webworms specifically; they build their homes near mine, grabbed my attention after I arrived, and kept building their homes in the same places, allowing me to return to their communities and learn from them. Agency is not always straight forward; we do not always know exactly why we cross through certain doors.

Still, because my personal life was so tumultuous, and because I was picking through the remnants of broken relationalities and trying to find my way back to my body, I was constantly

aware of the ways that my webworm-research provided an opportunity to think through topics that were important for my life beyond academia, how the events in my life were spilling back into my research. I was undoubtedly drawn to certain research questions because they seemed pertinent to my life. As I was critiquing settler colonialism's hierarchical visions of community, I was listening to family members deny that I had a right to consent over my own body. As webworms taught me to look directly at dimensions of the non-human world that made me feel uncomfortable, my therapist was teaching me to feel the difficult emotions associated with my trauma. And the task of finding better stories to live by, of dreaming of a better world—these reverberated across every dimension of my life.

Sometimes, I wish I'd integrated some of these more sensitive details into my research papers, though I'm not sure academic conventions could stretch that far. I'm also not sure I could have written about trauma while I was walking through it. And it's worth noting that there isn't a single, linear relationship between the events of my life and the three research papers enclosed, even as the two remain deeply entangled. In my mother's story, there was one voice and one door; in our living realities, we are being invited, called, and sometimes compelled to move one way or another by many different voices and forces. Some of these voices exist within the world of academia; others do not. Some of these voices are human; others are not. Some register outside of our immediate conscious mind; others appear clearly. Some are easily adopted into academic conventions; others are frequently discounted, marginalized, or ignored. The voices of non-humans—especially those who, like webworms, are considered ugly or otherwise undesirable—usually fit the latter category.

This complexity means that it's not possible to share everything, to acknowledge all influences, even as I want to do a better job of naming other creatures' voices, situating their

knowledge, and hearing their stories. Instead, I decide what voice to share, what stories to repeat; I'm still learning to hold onto my own agency alongside my inherited reality. But I *am* learning. In my research, writing, and storytelling, I've tried to attend to the stories of small, overlooked critters of this reality; I've tried to understand the worlds they come from, and why they might matter. I am proud of this work. It's proven to be academically and personally transformative to me, and I hope I will be helpful to others as well.

Janice Vis, *Fall Webworm Nest in Black Walnut Tree*, 2024.

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And so we arrive at a final set of introductions: brief outlines of the webworm-inspired research papers found in the pages that follow.

The first paper considers how non-human communities (like webworm nests) are named. More specifically, it investigates the word "colony" in relation to such social insects. By looking at this word's stories and histories, this paper considers how language can shape our understanding of the world; words lead us to notice some things—and to *not* notice others. This paper crosses disciplinary boarders, and it includes references to western science and entomological research, taking a critical look at some of the stories that circle around of insects' social relations, and asking how changing our language might change our perception.

While the first paper focuses on words, the second paper focuses on feeling—disgust—and it considers the stories that narrate and enact disgust in relation to webworm caterpillars. Sarah Ahmed's work on emotions is particularly important for the theoretical underpinnings of this research, and local newspaper articles illustrate webworm-disgust more specifically. Importantly, this paper isn't interested in shaming humans' distressing feelings; instead, it is interested in the dissonance between knowledge and action, arguing that what we *know* matters little if we do not attend to what we *feel*. Facts alone will not help us build respectful relations; we need to attend to a wider array of sensations that emerge within multispecies relationships.

The first two papers mostly attend to current human-webworm relations; the third begins to tell a different story about these caterpillars and their nests. Largely inspired by Edward Chamberlain's essay "Hunting, Tracking, and Reading," this paper thinks about what it might mean to read non-human tracks as literary texts, even as it acknowledges that reading and writing have become entangled with humancentric and Eurocentric worldviews. Is there space in literary

practices for non-humans? Instead of seeing webworms as colony-builders or disgusting pests, could I see them as creative writers and artists? What would that mean for our relationship? This paper is a thought experiment, and it demonstrates an effort to reimagine human-webworm relationships in a way that encourages peace and respect between species. This paper is rooted in the hope that we *can* reimagine our relationships, that we *can* tell stories that connect us with each other. And so, although this paper is the final chapter of this project, it does not represent an end. Instead, it is an invitation to keep going—to keep learning, to keep dreaming, to keep asking questions, and to keep telling stories.

Indeed, all of the research presented here is an invitation to keep learning from other creatures and their stories, especially those who tend to be overlooked or devalued.

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Introductory Note: Whose Colony?: Re-thinking Terminology for Insect Relations

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According to Agriculture Canada, fall webworm caterpillars "feed as a colony."[1] At first, this doesn't seem to be a controversial statement; many scientific reports and insect guidebooks have similar statements about webworm caterpillars' communal feeding practices. But, as anyone who studies language and literature knows, *how* information is presented is just as important as the information itself. In this case, if we take a closer look at the individual words, the word "colony" might seem a bit unusual. Although Agriculture Canada isn't the only source that uses the word "colony" in relation to webworms' silken structures, terms like "nest" and "web" are far more common. On the other hand, eastern tent caterpillars—a local species often confused with webworms—also spin webs, and their creations are frequently called "colonies"—the term even appears in their Wikipedia page entry.[2] And then there are species like bees, ants, and termites, whose communities are called "colonies" by default. I began to wonder: is there something fundamentally similar (or different) about the collectives of webworm and bees, some factor that made the label "colony" more or less appropriate? Was the word "colony" really the best term for any of these communities?

1. "Fall Webworm." Government of Canada, 24 Jan. 2020, agriculture.canada.ca/en/agricultural-production/crop-protection/diseases-and-pests-agroforestry/fall-webworm.

2. "Eastern Tent Caterpillar. Wikipedia, 25 May 2024, en.wikipedia.org/wiki/Eastern_tent_caterpillar.

I'll admit I was suspicious: for me, the word conjures up images of settler colonialism, of displacement, of land theft against Indigenous people, of violence. It didn't seem to belong to webworm caterpillars, who have been peacefully weaving their nests in this region for millennia, and I imagined it didn't belong to other species either. But I decided to find out, and so I pulled out some reference books and started to write.

I initially imagined I'd pursue these inquiries in a short blog post. However, the more I researched the word "colony" and its relationship to social insects, the more my blog post expanded, crossing more and more disciplinary borders. Soon, I was diving into etymology, entomology, evolutionary science, and urban bee keeping—all had their own relationship to this troublesome word. Balancing these different kinds of knowledge often felt tricky, especially since I'm not a scientist, a historian, or a bee keeper. I wanted to acknowledge the limitations of my knowledge, but I also wanted to follow where this word led me. It was clear that I was going to need to do a lot more research, and so my blog post morphed into a full-length academic paper.

The initial draft of this paper referenced webworms often, questioning whether or not the word "colony" applied to them. But because webworm nests are only occasionally called colonies, they hold an uncertain relationship to the label. It's easier to examine the origins and implications of the word "colony" in relation to ants, bees, and termites, because their relationship to the word is much more consistent. Scientists also research these insects' social relations much more than they do webworms', allowing me to begin to parse out the connection between the word "colony" and insects' intra-species relationships. And so, the more I researched this topic and the more I edited the draft of a blog post into a paper, the more references to webworms began to vanish, and other insects became much more prominent. Still, I wanted to

hold onto fall webworms; they were still relevant to my argument, and reading their stories had led me to this line of inquiry. And thus, I made a point to keep fall webworms in my discussion—that is, until the very last draft.

When this paper was accepted by the journal *Environmental Humanities,* the editorial staff asked me to cut some 800 words from the final manuscript, and I was told the paragraph on moth caterpillars was unnecessary and didn't fit with the rest of my discussion. I faced a dilemma: what to do? Did I accept the publication, remove webworms from the story? Did I argue with the editorial staff and hope that they would sympathize with my perspective? At the same time, I had to admit that I agreed with them—my references to webworms felt forced. They were relevant, but they certainly weren't necessary. And so, the last reference to webworms was removed. The paper had initially centered these creatures, and now it no longer mentions them by name. Webworms had pointed me towards an inquiry of research, but they don't get credit for their role as teachers.

To be honest, webworms' absence in this paper feels like a bit of a betrayal. Still, this paper's major arguments, including its call to avoid the uncritical use of the word "colony" and re-examine how we name non-human collectives, implicate human-webworm relations. Since writing this paper, I've been careful to avoid the phrase "webworm colony" in my research and in conversations outside of the university. In this way, this paper reflects my personal commitments to fall webworm caterpillars, as it has shaped my relationship to these creatures and it has changed how I share my knowledge about them. Moreover, this paper also reflects my desire to tell stories about non-humans that matter for everyone, and not just academics. Admittedly, the paper is written for an academic audience and has been accepted for publication in an academic venue, but many of its insights are more broadly relevant. As I previously

mentioned, "colony" is a frequently used term, and broadly speaking, this paper examines some of the assumptions attached to this word.

Regardless of which insects are discussed, this paper begins from the assumption that our words matter, that they shape how we see and interact with insect communities. Language can be seen as "a prism through which to see the world" (Kimmerer 258):[3] thus, by changing our language, we may begin to see (and react to) those surroundings differently. But researchers aren't the only ones surrounded by insects, and they aren't the only ones who use phrases like "bee colony" or "webworm colony." These phrases are used everyday by many people who hold varying relationships to insects, and they impact anyone and everyone who uses that language (though, notably, the impact is not uniform, as we all have our own history and investments in words.) And while simply avoiding the word "colony" in relation to insects may not seem like a revolutionary act, it is a clear, concrete step that anyone can take to begin to reexamine their relationship to these critters.

That said, I don't mean to imply that this paper has no particular academic relevance. On the contrary, when I started to pursue publication for this piece, I received a great variety of suggestions from reviewers, and it seemed everyone was interested, but everyone wanted me to expand it in a different direction. I received questions like: how does "colony" relate to "specimen"? Is this work a critique of western society's obsession with individualism? Could I talk about superorganisms? Why didn't I research ancient farms? Undoubtedly, many authors have to contend with a multiplicity of suggestions when working through the peer review

3. Robin Wall Kimmerer, *Braiding Sweetgrass* (Minneapolis, MN: Milkweed Editions, 2013), 208.

process. Still, I think the diversity of comments I received demonstrates how interdisciplinary work fosters unexpected connections; exploring vocabulary that crosses between communities can open pathways for further research in many different fields. While this paper makes its own argument, it also opens questions about naming, language, and hierarchal categorization that could be taken up by other scholars sometime in the future.

These topics—naming, language, and categorization—also emerge in the other papers presented here. For example, "Disgust, Discomfort, and Dwelling with Fall Webworm Caterpillars," considers how fall webworm caterpillars have been named "aesthetic pests," and it discusses some of the of hierarchies that are used to value non-human life; quite simply, some animal lives are considered more important than others. Then, "Web reading" ponders linear narratives of progress employed by western societies to prove the supposed superiority of humans, and more particularly, white, European humans. Although these discussions have different focal points, they nonetheless reflect each other. Thus, this paper not only stands by itself, but it also provided me with foundational research for my future writings.

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Whose Colony?: Re-thinking Terminology and Insect Relations

There's that word again.

I scribble an arrow, make a quick margin note, and peel off an orange post-it. As I mark the page, I can't help but glance over at a stack of nearby books—orange tags pop from the pages of poetry and pop science alike, glowing like tiny caution flags outlining a meandering path across genres. *What is this word doing?* As a literary scholar in the environmental humanities, my reading lists tend to be varied, and I frequently adjust my reading practices to account for shifting jargon. But sometimes cross-disciplinary research invites further scrutiny of familiar vocabulary: words' assumed meanings are upended, and conflicting knowledge systems are brought into sharper relief, because regardless of genre or academic field, the stories of non-humans are told through terminology and nomenclature as much as through carefully crafted narratives. Words imply, suggest, and create associations that shape how we understand more-than-human communities. Of course, any formula that reduces knowledge formation to a singular cause-and-effect narrative surely misrepresents the real-life experiences of linguistic beings; scholars have understood language as a practice to "build relationship, not only with each other but with the living world"[1] and a "substance" that is constantly "react[ing] back upon [itself]" as peoples share ideas.[2] Regardless of the finer details of such metaphors, language *is* entangled in how (different) people know and live (differently). Sometimes these entanglements are hard to track; sometimes they are so commonplace they're invisible unless you're

1. Robin Wall Kimmerer, *Braiding Sweetgrass* (Minneapolis, MN: Milkweed Editions, 2013), 208.

2. Cristopher Hollingsworth, *Poetics of the Hive: Insect Metaphor in Literature* (Iowa City, IA: University of Iowa Press, 2005), 9.

intentionally looking. And recently, I've begun looking at one confounding term—*colony*—and more specifically, the *insect colony.* What is an *insect colony*? Why use the word *colony* to describe insects? What meanings does this terminology carry? What implications might arise?

I'm certainly not the first to wonder about the words that describe insects' social arrangements, especially since terminology naming humans' societal systems is often grafted into descriptions of non-humans. When used thoughtfully, such linguistic decisions can encourage understanding and empathy between creatures. For example, Anishinaabe scholar Vanessa Watts explains that "ecosystems are better understood as societies from an Indigenous point of view… Non-human beings are active members of society."[3] Here, the word *society* frames non-humans' social structures as purposeful and orderly, emphasizing non-human sovereignty while leaving room for diversity. Many different species are part of ecosystem-societies; humans and non-humans alike contribute. I find this term helpful, and in the discussion that follows, I use the compound *ecosystem-societies* to challenge Euro- and human-centric knowledge. Other scholars, artists, and activists have also carefully selected their words to emphasize reciprocity and mutual care. For example, honeybee keeper Ang Roell uses "sister bees" instead of "worker bees," framing the hive as a family, not a business.[4] When I hear *worker*, I imagine bees as tired labourers driven to expand, but when I hear *sister*, I imagine buzzing critters taking care of each other. The term thus changes how I understand the bees' relationships, their intentions, and their potential. Roell's word choice will be familiar to many

3. Vanessa Watts, "Indigenous place-thought & agency amongst humans and non-humans (First Woman and Sky Woman go on a European world tour!)," *Decolonization: Indigeneity, Education & Society* 2, no. 1 (2013): 23.

4. Ang Roell, interview with Ayana Young, "ANG ROELL on the Relations of the Beehive," *For the Wild Podcast*, episode 301, Aug 24 2022.

who work closely with animals or are familiar with traditional knowledge; many Indigenous Nations have long understood their relationships to non-humans through the language of family.[5]

But often, the labels applied to non-humans and non-human communities aren't rooted in Indigenous thought or leftist critiques. Instead, they find their origins in Natural History—a forefather to modern biology—and colonial understandings of politics and power. Many scholars have aptly expressed concern that such descriptive practices are built upon Eurocentric ideals, upholding structures of oppression that naturalize hierarchies and compromise research. For example, Natasha Bharj and Peter Hegarty tackle the word *harem* in evolutionary science, arguing that it "reflects and potentially reproduces racist stereotypes."[6] According to these scholars, research that describes non-human families as *harems* draws from inaccurate ideas of Muslim and Middle Eastern cultures that tend to present women as "hypersexualized" and men as "barbaric"; non-human families are thus seen through the lens of polarized passivity and dominance, and so the term misrepresents both human cultures and non-human life while catering to a white, Euro-American perspective.[7] Meanwhile, Joan M. Herbers advises researchers to stay away from the label "slave-making ants" used to describe parasitic behaviour in some ant species, as it creates a "connection with human brutality that is hard to shake," and so potentially misconstrues researchers' understandings of the ants' actions and intentions. [8]

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5. John Borrows, "Indigenous Law Examples," in *Canada's Indigenous Constitution,* (Toronto, ON: University of Toronto Press, 2010), 59-104. Indigenous understandings of family extend beyond blood relations. In many Indigenous languages, family markers ("brother," "sister") are verbs; they describe active relations not pinned down by bloodline.

6. Natasha Bharj and Peter Hegarty, "A postcolonial feminist critique of harem analogies in psychological science," *Journal of Social and Political Psychology* 3, no.1 (2015): 259.

7. Bharj and Peter Hegarty, 259.

8. Joan M. Herbers, "Watch Your Language! Racially Loaded Metaphors in Scientific Research," *BioScience* 57, no. 2 (2007): 104.

Further, the thoughtless application of the term "slave" glosses over the violence of human slavery and could make insect studies less inviting to Black and other non-white researchers.[9]

These might initially look like exceptional cases, but they are part of a longer history circling terminology in entomological research. The mistakenly named "king bee" is now-defunct but a more broadly known example of how language has reproduced misguided assumptions. As science writer Lisa Margonelli explains, when sixteenth-century European naturalists noticed that one bee held a distinct role in the hive, they drew from their society's understandings of power; following the prevailing patriarchal belief that men were natural leaders, most Western researchers of that day assumed that "only a male king could be head of such a magnificentine state,"[10] and so described the bee as masculine. Thus, these researchers' expectations, rooted in their own social relations, changed how they linguistically addressed the bees, and by writing down the word *king*, subsequent researchers inherited an inaccurate understanding of the hive. Cultural associations connecting masculinity and leadership were simultaneously legitimized, reflected in scientific language and education. However, when research eventually demonstrated the king bee was female, researchers changed the label from *king* to *queen*. Although the term still presents the hive as a monarchy, the linguistic shift was necessary to correct false assumptions and allow researchers and readers to glean a more accurate understanding of the insect community.

9. Herbers, 105.

10. Lisa Margonelli, *Underbug: An Obsessive Tale of Termites and Technology* (New York, NY: Farrar, Straus and Giroux, 2018), 44. This understanding of beehives was not without debate. According to Hollingsworth, researchers as early as 1586 identified the queen as female, although they were in the minority (274).

But bees—and other insects like ants, termites, and wasps—aren't just described as having a *king* or *queen*. They're also described as having a *colony*. And, just as labels like *harem* or *slave* can affect our understanding of social arrangements, *colony* is oriented[11] towards certain understandings, shaping expectations about how a community should look, its inter- and intraspecies connections, and its participation in broader ecosystem-societies. These linguistic orientations might not be immediately apparent, especially since the word *colony* is currently used in many contexts—recall my orange tags scattered across genres—that hold different relationships to colonial histories.

WORD HISTORIES

A word's histories cannot be comprehensively mapped, and its past does not represent a pure meaning. Nevertheless, a brief glance into *colony*'s history provides some insight into how it has become meaningful within certain discourses. The earliest recorded uses of *colony* (from the Latin *colonia*) emerge in the 14th century, describing Roman settlements "in newly conquered or hostile territory."[12] *Colonia* sprouts from *colonus*—a "tenant farmer, settler in a new land"—which can be traced to *kwel*, meaning "revolve, move round; sojourn, dwell."[13] Without unpacking the nuances of all these connections, themes of movement and settlement (especially involving agricultural pursuits) come to the fore. Since its beginning, the word *colony* marked a

11. I use the word "orient" to emphasize how language directs our attention towards different elements of meaning. I do not mean to imply a static centre from which we navigate the world.

12. *Oxford English Dictionary,* s.v. "colony, n.", September 2023.

13. Douglas Harper, "Etymology of *kwel-." in *Online Etymology Dictionary,* accessed Aug. 7, 2023.

place of contested and shifting ownership where conquerors built and migrants cultivated their own social arrangements, re-tilling and re-making land and borders.

Colony soon expanded beyond ancient empires, being applied to any "body of people who settle in a new locality."[14] This meaning is familiar to many of today's readers, especially in the context of settler colonialism and the colony-building of Euro-American powers worldwide. To be sure, not all colonialism is settler colonialism, wherein "colonizer and settler displace the [I]ndigenous population," intending to "remain on the land" permanently; colonial powers also built temporary military outposts and exerted economic pressures to control people and resources.[15] According to Glen Coulthard, colonialism is "the sum effect… of interlocking oppressive social relations," which unfolded differently in different places.[16] But the complexities around naming human colonialisms only adds more confusion to the naming of animal communities, because around the same time that European empires embraced their projects of expansion, *colony* migrated to the natural sciences, where it meant a "group of animals of the same kind that establishes itself… esp. in a new locality."[17] The movement of non-humans was thus labelled with the same word as the movement of European settlers, although the newcomers aren't necessarily hostile in this description, and the nuances of the relations between non-human populations are less defined. This migration-focussed definition is

14. *Oxford English Dictionary*, s.v. "colony, n.", September 2023.

15. Tiffany King, "Settler Colonialism and African Americans," in *Oxford Bibliographies*, last modified May 29, 2019. doi: 10.1093/obo/9780190280024-0071. King also suggests that narrowly focusing on settler colonialism can obfuscate other forms of colonial power.

16. Glen Coulthard, *Red Skin, White Masks: Rejecting the Colonial Politics of Recognition* (Minneapolis, MN: University of Minnesota Press, 2014), 15.

17. *Oxford English Dictionary*, s.v. "colony, n.", September 2023.

still used today, but in many instances, the word's usage has become even more vague, with connotations of re-location falling away. A recent edition of *The Dictionary of Environment and Ecology* defines *colony* as "a group of animals, plants or microorganisms living together in a place."[18] While extremely broad, this definition reflects how *insect colony* is used in popular culture and academic research. Most of the sticky notes in my small library aren't marking discussions of non-human migration, but collective living. Whether it's Tiffany Higgins' invocation to "dance… while the colony disassembles" in her lyrical meditation on Colony Collapse Disorder[19] or the clinical reporting in statements like "hygienic behaviour in adult workers is expected to reinforce the social immunity of a honey bee colony,"[20] the term appears to neutrally mark a group of critters.

Yet, the idea that *colony* benignly describes creatures living together doesn't quite hold up to scrutiny. Many creature-groupings aren't called *colonies*, while for others, *colony* is the go-to term. Furthermore, I'm doubtful that a word carrying so many political complexities in one context should simply be accepted as a neutral catch-all term in another—at least not without further investigation. But further investigation is tricky: *colony* is a common term in insect literature but is rarely defined in research. Definitions in reference texts are imprecise and inconsistent. However, the absence of a clear definition doesn't mean the term has lost all

18. P.H. Collin, "colony," in *Dictionary of Environment and Ecology*, 5th ed. (London UK: Bloomsbury, 2011), 40.

19. Tiffany Higgins, "Dance, Dance, While the Hive Collapses," *Poetry Foundation*, accessed April 12, 2023, www.poetryfoundation.org/poetrymagazine/poems/58655/dance-dance-while-the-hive-collapses.

20. P. Page et al., "Social apoptosis in honey bee superorganisms, *Scientific Reports* 6, no. 27210 (2016): 2.

meaning: cultural associations and linguistic relations emerge through repeated use, carrying knowledge. Again, words orient us differently towards other beings and places, shaping possible trajectories for our more-than-human relationships—which brings me back to my earlier question: what is the word *colony* doing?

Rather than searching for a single answer, I've been tracing some of this words' different doings as they appear to me, tugging at threads, watching what falls out. From one perspective, this essay is a story about paying attention to a word, and it demonstrates how word-tracking can be a methodology that reveals connections and tensions in knowledge systems. From another, it is a tentative argument against the word *colony* as it currently appears in relation to insects, and more specifically, eusocial insects like bees, ants, and wasps.[21] I believe the term orients researchers and their readers away from multi-species entanglements, muddies conversations about non-humans relationship to colonialism, and re-frames knowledge so that it can circulate through knowledge systems that see social relations through hierarchies. More broadly, though, I think about this work as a provocation to ponder the words that we use to describe non-human communities and to adopt new language practices that better attend to more-than-human-histories and colonial entanglements.

MARKING DIFFERENCE AND SEPARATION

When *colony* first caught my attention, I began to wonder how the same term could be used to describe communities in vastly different situations. The term hints toward a history, but

21. Timothy Linksvayer and Brian R. Johnson, "Re-thinking the social ladder approach for elucidating the evolution and molecular basis of insect societies," *Current Opinion in Insect Science* 34 (2019). Eusocial insect communities display "reproductive division of labor, cooperative brood care, and overlapping generations."

obliquely, suggesting a story that might or might not be true. That is, an ant, bee, or termite colony might be a recent addition to a place; it might index a foreign presence, the exploitation or re-working of land—or it might not. Imagine a family of ants building their home in the same meadow for centuries, evolving alongside other critters and contributing to the ecosystem's wellbeing. The community would still be called a *colony* in English vernacular, although it hasn't moved into a new locale. Might this label undermine the deep histories the ants share with the ecosystem-society? Now, suppose another species of ant is introduced into the meadow, disrupting the ecosystem's established rhythms. This species' homes would also be called *colonies.* I find this worrisome: using the same word to describe these two hypothetical communities draws attention toward their similarities, away from their different relationships to their environments, and away from the responsibilities accompanying those relationships. Further, by directing attention away from environmental relations, the term might inadvertently suggest that researchers don't need to know how a community is situated to understand the community itself.

While following this thought, I found myself returning to the Roman and Latin *colonia*. These early settlements varied in character—some were militant and other agricultural—but they shared a crucial feature: inhabitants held Roman citizenship. Similarly, Europeans travelling the globe generally maintained allegiance to European powers. From the perspective of colonizers, the core identity of colonial settlements was decided before a hammer was raised: a *British* colony in America and a *British* colony in Australia would both be identified by their relationship to the British government and the associated laws and norms (even if that relationship was conflictual). This isn't to say that colonies were identical. Colonies served different purposes, and newcomers survived particular material conditions by building various alliances and

navigating complex political relations with Indigenous Nations and other colonial powers. But even when allegiances shifted, the overarching power structures that tied colonies to European customs often did not. Looking at the colonization of her People's lands, Māori scholar Linda Tuhiwai Smith identifies a "specific spatial vocabulary" within the colony—in both its architectural and linguistic arrangements—which includes a "centre" and an "outside," wherein "orientation to the centre was an orientation to the system of power."[22] Examples of a colony's centre include flagpoles, government buildings, and religious symbols.[23] The centre illustrates the colony's loyalty to the European mother country, reminding the colonists of that nation's legal and moral codes. Theoretically, the social arrangements deemed desirable within the colony would have been previously established in the mother country's custom and law—that is, they would have been imagined outside of the places where they would unfold. Meanwhile, the representation of the "outside" space "positioned territory and people in oppositional relation to the colonial centre";[24] the colony and the outside existed as a binary. The outside did not represent a different equal society, but rather the (apparent) lack of proper social relations. Such geographic descriptions set the colonies apart; they were bastions of civilization in uncivilized lands. And because colonies' loyalties to their empires were not context-dependent, differences between colonies could be described according to their differing services to their empires, while their place-specific obligations to Indigenous Peoples and lands went unspoken.

22. Linda Tuhiwai Smith, *Decolonizing Methodologies: Research and Indigenous Peoples,* third ed. London, UK: Bloomsbury Publishing), 61.

23. Smith, 61.

24. Smith, 61.

The *insect colony* is not described in precisely the same terms as human colonies. Nevertheless, as I followed *colony* across texts and contexts, between humans and insects, it always carried its own geographies, invoking a sense of separation from its surroundings, as if a colony is an island unto itself, something planted in an already-existing environment. The colony stands apart—or perhaps, calling a community a *colony* suggests that it stands apart. To some degree, all place-labels are separators; words like *city* or *house* also draw a boundary around one place, setting it off from its context. But I think the connotations following *colony* are more significant; the history of moveability and place-independent identity is baked into the word. Hollingsworth's analysis of bee hive metaphors similarly suggests that insect societies are generally seen as discrete wholes. Examining sources from antiquity to the twentieth century, Hollingsworth identifies a "spatial positioning," wherein an observer "is placed above an observed" society—a beehive—"so as to apprehend it as a whole." [25] But as the society is seen as a singular whole, it becomes differentiated from its expansive field: the bee society becomes a travelling model "positioned vis-à-vis" the human observer, an abstraction separated from its context. [26]

Of course, demarcating different communities *is* important: in situations relating to human settler colonialism, acknowledging different peoples, cultures, and sovereignties is essential for understanding colonizer-Indigenous relations. I am reminded of the original wampum agreement made between the Haudenosaunee and Dutch traders on the lands I now call home, wherein two lines of purple on a white wampum belt mark two peoples "separate but equal in status, never

25. Hollingsworth, 3.

26. Hollingsworth, 3.

interfering in each other's social or political affairs. To the Haudenosaunee… this was a declaration of sovereignty as well as recognition of the rights of outsiders within their territory"; this relationship was intended to be reciprocal, where difference occurs alongside respect[27]—a very different image than the "centre" and "outside" that Smith finds in descriptions of the European colonies. But more to the point: how we mark difference informs our understanding. Mis-marking difference leads to misunderstandings, which is where my concern with the *insect colony* emerges. The relationships between European colonists and Indigenous Nations aren't the same as all social insects' relationships with ecosystem-societies. Different insects will have context-specific relationships to human colonies. There is no need to universally impose humans' social categories onto insect life, or to suggest (even obliquely) that ant, bee, termite, and wasp communities are not full members of their ecosystem-societies. While the term *colony* might not make this claim explicitly, it nevertheless de-emphasizes the community's continuance with the surrounding environment. Instead, it orients researchers and readers toward the non-human community as its own, decontextualized entity. Troubling consequences emerge from this conceptualization: on the one hand, destroying a colony might seem reasonable if the community isn't recognized as an integral part of an ecosystem. On the other, if the environment is not seen as integral to the insects' development, researchers might underestimate essential local relations, leading to further misunderstandings.

27. Rick Monture, *We Share Our Matters: Two Centuries of Writing and Resistance at Six Nations of the Grand River* (Winnipeg, MB: University of Manitoba Press, 2014), 14.

WHOSE COLONY AND WHOSE SOCIETY?

But how, then, is the insect colony described, if not according to its history or environmental relations? One clue emerges within the common descriptions of social insects. As I mentioned earlier, human colonies carried an already-established set of social arrangements; the social structures within insect colonies have often been named similarly to the structures found in human colonies, inviting researchers and bug-enthusiasts to impose their knowledge of human colonial relations onto insect life. For example, many human colonies were first imagined as resource centres, and all were valued for the economic gains they provided the empires. So too, capitalist-sounding descriptions of profit, production, and expansion circulate around colony-building insects. Community organization is dubbed "division of labour" and insects are labeled according to their supposed jobs—"soldiers" or "foragers"—inviting a mechanistic view of insect life. Insects have been praised as representations of economic systems: they are "the epitome of industrial efficiency" for the Victorians and, more recently, "exemplars of flexible problem-solving" amid colony growth.[28] Productivity-focussed research seeps into cultural imagination: we hear cliches like "busy bees" and imagine a string of ants like a homogenized assembly line. But capitalist frameworks fail to encompass the flexibility of insects' behaviour or the multifaceted motivations entangled in their actions. Play, rest, and creativity are left unnoticed, even though they are key components of insect life (and, more recently, growing areas of research).[29]

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28. Joanna Page, "Sensory worlds and the pluriverse," in *Decolonizing Science in Latin American Art* (London, UK: UCL Press, 2021), 215.

29. Roell sees hives thrive through "patterns of expansion and contraction," and not unlimited growth. See also Carol Gigliotti's *The Creative Lives of Animals* (NYU Press, 2022).

In raising these examples, I do not want to suggest there is a single, static image of social insects. Symbolic significances are ever-shifting; entire books tackle the nuances of particular insect representations, and concerns about economic theories' impacts on biological research have been discussed since at least the early 20th century.[30] Nevertheless, a reader doesn't need an extended background in non-human representation to notice the proliferation of the language of profit motive in descriptions of non-human life.

In addition to a focus on productivity, the word *colony* invites expectations of hierarchical power relations within the community. Although *king bee* may have been kicked out, the designation *queen bee* still invites speculations about political power. That is, calling a bee a *queen* suggests she exercises authority over the hive. Those who work with bees knows this is not the case; as beekeeper Roell explains, the queen "makes no decisions," and the hive often makes choices by communicating through vibration and dance. Bee-governance and communication are fascinating—and best explained by professional entomologists and beekeepers rather than myself—but their complexity is too easily overshadowed by the assumptions of hierarchy that follow the naming of a *colony* and *queen*. Similarly, in his well-known book *Biophilia*, Wilson explains the ant queen "is not in any sense the leader."[31] Consider: both Roell and Wilson—working nearly forty years apart—feel the need to explicitly

30. George F. Oster and Edward O. Wilson, "A Critique of Optimization Theory in Evolutionary Biology," in *Caste and Ecology in the Social Insects, Volume 12* (New Haven: Princeton University Press, 1979), 293.

31. Edward O. Wilson, "Bernhardsdorp," in *Biophilia* (Cambridge, MA: Harvard University Press, 1984), 36.

name the queen's lack of authority to avoid misunderstandings; this suggests that the default assumption invites an inaccurate interpretation of hierarchal relations.

Margonelli faces this term-confusion directly when working alongside termite researchers in Namibia. Upon seeing a termite queen for the first time, she suggests that the critter is more of a captive than a monarch: "and yet," she muses "we *do* refer to her as a queen. I wondered why."[32] When Margonelli asked the nearby researchers about the royal title, she was referred back to early natural historians who "saw Europe and its political structures in miniature" inside insect communities and labelled insects' social relations accordingly.[33] That termite societies growing in Africa would somehow take on European social structures seems bizarre, but points to a more insidious problem—that of "imperial eyes," a phrase that Smith borrows from Mary Louise Pratt.[34] As Smith explains, colonizers carry ways of seeing and representing colonized lands built upon the assumptions of a "universal model" of society—that is, the belief there was (and is) only one true society, the society exemplified by post-Enlightenment European nations.[35] Any civilization, then, could supposedly be understood (and judged) using European knowledge frameworks, and so "imperial eyes" justify hierarchal thinking. Further, Bharj and Hegarty argue that the presumed universality of European knowledge systems "risks the confusion of those particular human arrangements with nature. One consequence of this confusion is that systems of

32. Margonelli, 44.

33. Margonelli, 44. Hollingsworth traces this label back to Greko-Roman empires; a detailed examination of how natural science and European colonialism emerged from the ancient world is beyond the scope of this essay.

34. Mary Louise Pratt, *Imperial Eyes: Travel Writing and Transculturation*, second ed. (London, UK: Routledge, 2007).

35. Smith, 99.

dominance… can appear to have a basis in nature to be apolitical, inevitable, or legitimate."[36] Now, the belief that nature (whatever the term might mean) is apolitical, inevitable, or inherently legitimate is itself a misstep. Nonetheless, by describing non-human communities as European political structures, these structures were presented as a universal norm, a law of nature perhaps, and not the invention of a particular culture at a particular moment in history. [37]

Researchers might say that advancements in scientific research have overcome these misunderstandings and false assumptions, at least in relation to insect communities. I will speak more to scientific research later, but it's important to acknowledge that lexicon doesn't dictate research procedures in such a straightforward manner. As researchers learn from and alongside insects, their foci shift to reflect their growing knowledge. Today's entomologists don't design their experiments as if the queen bee or termite bosses everyone around, and animal creativity is a growing field of study. Moreover, if a researcher uses the term *colony,* that doesn't mean they personally support capitalist or assimilatory policies. There is an overwhelming amount of entomological research that foreground cooperation and interdependence; living amid climate crises, many academics are deeply concerned about capitalisms' failures. But not everyone is an academic, and common terminology is one of the primary ways that many people learn about non-human life, shaping how insects are perceived. If the misleading lexicon continues to be the

36. Bharj and Hegarty, 261.

37. The research situation that Margonelli witnesses embodies some of the tendencies of colonial science outlined in this paper, as researchers do not engage with local ways of knowing or communicate with local peoples (although there is a Namibian grad student). Margonelli doesn't critique colonial scientific practices but acknowledges how following the researchers' work initially allowed her to overlook current political events unfolding in Namibia and the nation's history as a German colony.

default, then misleading assumptions about insect relationships will circulate. I can't help but wonder: if these labels have been acknowledged to be erroneous, why not change them?

Perhaps I am overstating the impacts of single words. As I journeyed with *colony*, I often found myself struggling to determine the extent to which human colonial histories have affected the use of the word in relation to insects. I wondered if I was inventing associations because I had been exposed to discourses about settler colonialism within the university. But my uncertainty marks an important part of word interpretations: we carry our own experience with words and their meanings. Assuming *all* people can and will accept historically loaded terms as misleading-but-innocuous terms seems ill-advised. Discourses swirling around insect and human relations ought to be more attentive to words' potential power, to the connections they do or do not enable, and how these connections could be meaningful to people who exist in varying relations to non-humans and more-than-human colonies. And so, as I followed my own relationship with this word, I found another problem arising: just as the vague use of the word *colony* colours over a wide variety of relationships between non-human species and environments, it also colours over the different relationships that non-humans have with colonialism.

OVERLAPPING COLONIES

The many ways that non-human communities might (or might not) form are bound up in the colony-building projects of human peoples. Although *colony* did not originally name insect communities, insects were always implicated in colonial projects: the expansion of ancient empires "provided new pathways" for insects to be introduced to new ecosystems, especially

through food transport and storage.[38] These migrations are often narrated through the language of agricultural "pests" and "infestations," but they nonetheless reveal the multi-species effects of what was intended to be primarily single-species travel.

More recently, the colonization perpetuated by European empires forced many non-human species to drastically alter the composition of their societies. This is not to say these societies lived in predetermined loops prior to European arrival; non-human beings travel independently of human action, and many would have travelled the extensive trade routes maintained by Indigenous peoples. Still, when colonists traversed the globe, they brought along new insects, insect food sources, insect predators, and ways of interacting with the land. Discussions of introduced species often contrast "good" native species with "bad" introduced ones, but the actions of individual creatures should be contextualized within land-keeping practices.[39] For example, Indigenous Peoples had various culture-specific technologies for plant cultivation, including natural insect repellents, forms of hand-pollination, and the strategic use of fire to encourage plant growth.[40] However, European colonists began cultivating European-style farms, and these large, grid-based monocrop fields drastically shifted many creatures' life potentials. Some insect communities swelled, swarming amid fields full of their favourite foods. Others dwindled, lacking access to a variety of plants. Such ecological changes had cascading effects: as insect populations shifted, colonists had to re-adjust their living practices. Insects lived in

38. Eva Panagiotakopulu and Paul C. Buckland, "A thousand bites – Insect introductions and late Holocene environments," *Quaternary Science Reviews* 156, (2016): 32.

39. Nicholas J. Reo and Laura A. Ogden, "Anishinaabe Aki: An Indigenous Perspective on the Global Threat of Invasive Species," *Sustainability Science* 13, no. 5 (2018): 1444.

40. Gregory Younging, "Appendix D: Gnaritas Nullius (No One's Knowledge)," in *Elements of Indigenous Style: A Guide for Writing by and about Indigenous Peoples* (Edmonton, AB: Brush Education, 2018), 110.

relation to colonists, sometimes in colonies, but not as straightforward allies or enemies to colonial projects. To keep farming profitable, colonists invented various kinds of pest-control; in the West Indies, prospectors cut down entire forests, attempting to diminish insect life on plantations.[41] Meanwhile, pollinators were (and are) valued. Eventually, the strategic transportation of bees over long distances became key to the colonial agriculture industry. These examples—and countless others—had cascading effects. The particularities of colonial-insectile entanglements are as diverse as the ecosystem-societies they impact.

Confronting colonization's legacies requires considering how introduced species and living arrangements caused, in the words of Alan Bewell, "struggle[s] between competing natures" that rapidly altered ecosystem-societies.[42] The history of these struggles is also the history of colony-building and subsequent colonial states; grappling with these histories requires thinking about the material implications of colony-building across creatures and timescapes while remaining sensitive to more-than-human entanglements. To be clear: I am not suggesting that all species introduced through settlement or trade are *colonists*, but rather that most researchers—myself included—currently lack a lexicon to grapple with colonialism's more-than-human dimensions.

For example, when reading about the rising popularity of urban bee-keeping, I kept wondering how to understand *bee colonies* in, on, and alongside cities that carry and perpetuate histories of *settler colonialism*. First, not all bees are native: many popular honeybees have been introduced for their honey-making capacities and their ability to pollinate monocrop fields.

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41. Monique Allewaert, "Insect Knowledges, Power, and the Literary," *American Literary History* 33, no. 3 (2021): 462.

42. Alan Bewell, *Natures in Translation: Romanticism and Colonial Natural History* (Baltimore, MD: Johns Hopkins University Press, 2017), 15.

Introduced species are not necessarily exploitative, and many have integrated into ecosystems; still, there is increasing concern about the effect that introduced honeybee species have on native bee and plant populations.[43]

A further complication: all bees (and other insects) who build communities in Turtle Island also exist in relation to settler colonialism, and these relations affect how insect communities enter discourse. For example, while describing the growing acceptance of urban bee-keeping in New York, Lisa Jean Moore and Mary Kosut question *which people* are given credit for working alongside their buzzing neighbours: "Educated, relatively financially stable, racially white, and often female, this cohort lends credibility and interest to a phenomenon that isn't necessarily new."[44] Bees' legibility within environmental movements occurs within systems of race and class inseparable from European settlement; the white women's multispecies relationships are "credible" because of their position within these hierarchies. Understanding such multispecies and multi-colony complexities matters, and it is perhaps too easy to overlook the colonial origins of urban centres in colonized lands when discussing the *insect colony.* That is, if a *colony* is a community built upon a pre-existing environment, then an urban *insect colony* imagines the urban centre as the original land now being colonized: the center's origins as a colony itself are neutralized. The responsibilities that non-Indigenous bee-keepers hold in relation to the Lenape and other Indigenous Peoples fall out of focus when not carefully attending to how different so-called colonies overlap. Not all non-Indigenous people have the same relationship to land either;

43. James H. Cane and Vincent J. Tepedino, "Gauging the Effect of Honey Bee Pollen Collection On Native Bee Communities," *Conservation letters* 10, no.2 (2017): 205.

44. Lisa Jean Moore and Mary Kosut, "Among the colony: Ethnographic fieldwork, urban bees and intra-species mindfulness," *Ethnography* 15, no. 4 (2014): 7.

some are descendants of colonizers, others of enslaved peoples, others of refuge-seekers. Researchers must attend to nuance, acknowledging positionality. Meanwhile, it would be an error to equate the relationship between Indigenous Nations and settlers to the relationship between all New Yorkers (some of whom are Indigenous) and colony-building bees. Different creatures live in varying relations to histories of settlement and dispossession. I worry that uncritically applying the word *colony* to insect communities hinders our ability to have conversations about these multi-species colonialisms.

EUSOCIALITY AND EVOLUTION

The more time I spend with this word, the more intrigued I grow with its associated scientific knowledge frameworks. Despite vague definitions and uncertain relations, there are patterns in *colony*'s usage. More specifically, the word seems to be closely attached to species who fit the criteria for *insect eusociality*—that is, communities who display "reproductive division of labor, cooperative brood care, and overlapping generations."[45] Essentially all insects who are classified as eusocial—ants, bees, wasps and termites—are habitually said to live in colonies.[46] *Colony* frequently appears in definitions of eusociality: according to a 2020 article, "eusocial species are those that live in colonies."[47] Another echoes, "Insect societies, i.e., the colonies of eusocial

45. Linksvayer and Johnson, 123.

46. Sometimes *colony* is applied to non-eusocial insects, but not consistently.

47. Heikki Helanterä, "An Organismal Perspective on the Evolution of Insect Societies," *Frontiers in Ecology and Evolution* 4, no. 6 (2016): 1.

[insects].”[48] *The Cambridge Dictionary* defines eusocial as “living in colonies,”[49] and the *Encyclopedia Britannica*’s entry on eusocial species begins with the words “any colonial animal species.”[50] These sources do not share a common approach, nor do they employ their terminology toward the same ends. Still, *colony* appears to be a generally accepted label for eusocial insect communities.

If *colony* carries connotations of uprootedness, then its connection to eusociality shouldn’t be surprising. As a framework for understanding other creatures, eusociality largely overlooks multispecies relations. Its criteria points researchers inward toward how members of the same species interact with each other, but not how they are situated within an ecosystem-society. Multi-species relations are irrelevant for determining if a collective is called eusocial. This does not mean it is impossible to think about insect colonies’ environmental entanglements—many researchers certainly have—but the word doesn’t orient us that way. The concept of eusociality aligns with *colony*, and permits studying the community a whole unto itself, apart from its ecosystem-society.

MORE NOTES ON NATURAL HISTORY

The intellectual severing of so-called colonies from their ecosystem societies is not an innocent mistake or the incidental fallout from misguided word choices. It is better understood as a legacy of early colonial science, which valued categorization and trait-identification over

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48. D.A. Friedman, B. R. Johnson, and T.A. Linksvayer, “Distributed physiology and the molecular basis of social life in eusocial insects,” *Hormones and behavior* 122 (2020): 1.

49. *Encyclopedia Britannica*, 2019, s.v., “Eusocial Species.”

50. *The Cambridge Dictionary,* s.v., “eusocial.”

relational awareness. I mentioned earlier that non-human communities in colonized lands have often been treated as resource pools for European expansionism; these imagined resource pools were both material and intellectual, intended to support the physical architecture of colonial expansion and the accompanying knowledge systems.

But the processes of using non-European non-human beings for the empire's gain required justification—for "imperial eyes" to see non-human life as European resources, they had to see this life as distinctly not interrelated with other societies. As Pratt explains, "Natural history as a way of thinking interrupted existing networks of historical and material relations among people, plants, and animals."[51] Its classification systems aimed to subsume "every species on the planet, extracting it from its… surroundings" and re-articulating it through non-localized labels and abstract categories—species, genus, phylum—that could represent them on a global stage. Under these labels, non-humans did not appear to belong to any people, place, or society, and were not composed of multispecies relations. In this way, non-humans were "drawn out of the tangled threads of their life surroundings and rewoven into European-based patterns of global unity and order."[52]

The dahlia flower exemplifies Natural History's extractive tendencies. As explained by Jamaica Kincaid, this South American blossom was originally called "cocoxochitl," a name referencing its ability to treat urinary tract disorders, reflecting its relationship to the cultural and medical histories of local peoples.[53] But the flower's name and community connections were

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51. Pratt, 32.

52. Pratt, 31.

53. Jamaica Kincaid, *My Garden (Book).* New York, NY: Farrar, Straus and Giroux, 1999, 118.

erased once the European explorers took the flower overseas. The cocoxochitl was classified into European plant taxonomies and "hybridized by the Swedish botanist Andreas Dahl, after whom it was renamed."[54] Now part of European knowledge systems, the plant could be bought and sold under the name of a white man to benefit the colonial economies. It could also be studied by European botanists without acknowledging the original cultivators or the plant's position within their society.

Kincaid calls the dahlia "a small detail" of "something large and grim: conquest."[55] This flower is but one manifestation of how Natural History erased local histories in favour of imperial world-making. Andreas Dahl alone is not the problem; regardless of the intentions of individual researchers, colonial powers could more easily claim and control natural resources by employing linguistic structures that erased their roots within local communities. But erasing these roots also meant undermining many realities of non-human life: "the radical character of colonial natural history lay less in the accuracy" of its representations than its ability to make the plants, animals, and communities "portable" both literally and intellectually.[56]

Although the history of the phrase *insect colony* is less straightforward than the re-naming of the Dahlia flower, it too undermines local relations in favour of universalized knowledge. Indeed, considering that a *colony* is a portable community—a community that can supposedly be imagined, built, and controlled from afar—natural history's disembedding aims seem especially applicable. When disembbeded from ecosystem-societies, insects' communities become

54. Kincaid, 119.

55. Kincaid, 118.

56. Bewell, 41.

autonomous units of thought; researchers can learn facts about insects and their social arrangements without being on the ground, studying their localized multispecies entanglements, or considering their relationship to humans. This kind of study does enable learning, but a certain kind of learning, provoking certain research questions. Rather than asking how a community fits within an ecosystem-society, research orients itself towards the community's position within a classification system; this requires comparing it to other communities which share its classification. Instead of asking "what alliances have developed between this beehive and the local raspberry community?" research might ask: "how do different beehives stack up against each other?"

This stacking-up is exactly what has happened: insect eusociality, "commonly defined by reproductive division of labor, cooperative brood care, and overlapping generations,"[57] lives on a spectrum—some colonies exhibit eusocial traits more strongly than others. But rather than understanding communities' unique social arrangements as responses to particular histories or environmental conditions, research has often placed them in hierarchical rankings; difference starts to look like better or worse. Communities that more obviously embody eusocial traits—having, for example, a clearer division of labour—are considered more advanced and complex, while those lacking these traits are simple and primitive; these designations change how insects are approached from an evolutionary standpoint. As Linksvayer and Johnson explain, "Researchers have long asserted that studying extant species with relatively simple forms of eusociality can provide general insight into the initial steps of eusocial evolution that likely occurred in the long-extinct ancestors of lineages with more complex forms of eusociality."[58] In

57. Linksvayer and Johnson, 123.

58. Linksvayer and Johnson, 123.

other words, researchers assume that so-named complex communities have evolved from more primitive forms of insect life that can be studied as "a living representative of the long-extinct ancestor" of the complex colonies.[59] Different eusocial insect societies are thus assumed to have the same evolutionary story; they are simply at different points on the timeline. Where a community falls within the singular evolution story—the degree to which it has progressed or advanced—is judged through the criteria for eusociality, a framework that largely overlooks the community's interactions with the wider ecology. Meanwhile, positioning an extant species as an ancestor for a more advanced species frames current life as ahistorical, something of the past, something that will pass—ignoring the ways it is present, active, and perhaps essential for its local ecosystem-society. "We refer to this line of reasoning and general approach as 'social ladder thinking'" write Linksvayer and Johnson. They continue: "social ladder thinking remains very widespread throughout the social insect literature" and "appears to have strongly impacted conceptualizations of social insect evolution, which in turn have shaped research questions, research approaches, and the interpretation of research results."[60]

I'm not a scientist, and I do not have the expertise to understand all the implications of social ladder thinking for entomological research, but Linksvayer and Johnson's descriptions of social ladder thinking are disturbingly familiar, reminiscent of colonizers' attempt to shoe-horn other peoples into narratives of social or cultural evolution. European anthropologists and sociologists thought they could "enhance the understanding of Western society" by studying "how simple societies developed the building blocks" of the systems that defined European

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59. Linksvayer and Johnson, 124.

60. Linksvayer and Johnson, 123.

life.[61] Other societies were thus framed as reflections of Europe's primitive past; researchers studied these peoples to learn where they fit into the story of Enlightenment, ranking them according to their progress by colonizers' standards—that is, how closely they reflected European ideals. Such scholarship denied the possibility that other peoples carried legitimate, alternative histories that would lead them to alternative futures. Instead, other cultures were expected to pass away, to "progress" towards something familiar to Europeans, or to amalgamate into colonial societies (57).[62]

It's difficult not to see parallels between European colonists' and early researchers' conceptualizations of human and insect colonies. Just as the imperial eyes Pratt and Smith describe saw only one mode of civilization, so too social ladder thinking implies that there is only one kind of advanced insect society. This assumption downplays the uniqueness of insect histories, overlooks their present relations with other species, and prescribes a homogenized future onto diverse communities. But, as Linksvayer and Johnson note, "there are many alternate ways [for insects] to make a living" (124).[63] There is no reason to expect so-called complex societies followed a set evolutionary path, and there is no reason to expect that simple eusocial species will eventually look like their complex neighbours. In fact, "species classified as having relatively simple forms of eusociality often seem to have maintained similar degrees of social complexity for tens of millions of years"; their "simple" social arrangements are clearly working for them (125). Alongside Linksvayer and Johnson, I see these species "as having successful…

61. Smith, 57.

62. Smith, 57. This assumption came alongside active efforts to assimilate Indigenous peoples (residential schools, the sixties scoop, banning traditional languages and spiritual practices, land pollution, forcible displacement etc.)

63. Linksvayer and Johnson,124.

life history strategies" that don't exist within the single-story of progression suggested by social ladder thinking (125). Celebrating these alternate lifeways requires unlearning the hierarchies that have shaped past research. But insects need to be appreciated for how they live today with a broad set of intra- and inter-species relationships. It's time to seek out alternative descriptors to help us to appreciate these small critters for who they are, for what they do, and not for their relation to human colonies or some measure of progress. Perhaps expanding our vocabularies to acknowledge how communities are historically and presently embedded in physical and conceptual landscapes could interrupt the expectations of imperial eyes.

CONCLUSION

Abandoning *colony* won't solve all the problems that strain our relationships to non-human critters, but I don't use the word *colony* anymore in my work with insects. If current terminology makes it difficult to understand more-than-human living arrangements and easier to adopt hierarchical knowledge systems, then surely it's time to find a different lexicon. Replacing *colony* with *community* (as I have often done in this piece) or thinking about ecosystem-societies (as Watts does) may be an important first step. I think we can do better, too. Again, words carry and create associations, and insect communities have distinct histories within ecosystem-societies which include overlapping colonial forces. Facing these histories—and acknowledging our unique positions within them—requires us to go beyond species taxonomies or other forms of universal classification. Instead of defaulting to a label like *colony* every time an ant hill or beehive appears, perhaps research should ask "how are these particular ants and bees embedded in their environment, and how does language invite researchers into those relationships?" Perhaps sometimes species do act as colonizers, but this term should describe a relationship born

out of specific material circumstances, and not a trait that simply belongs to one species or another.

To name communities according to their relations rather than species identification would require knowing particular histories of ecosystem-societies. Such local, intimate practices of naming would need to be as flexible as the communities they describe, and they would need to shift as relationships change. Refusing to simply swap one term for another or immediately jump to an answer congruent with familiar hierarchal logics would also require researchers to "learn how to step into not knowing as an ethic and a practice… Not knowing is not about cultivating ignorance or indifference. Rather it is a capacious and humbling space that offers some refuge from the hubris of knowledge systems… bound so tightly to colonial conquests."[64] The process of re-thinking and re-naming more-than-human relations requires listening to other knowledge systems, and re-learning to cultivate attention to other creatures.

Such a project of re-description may sound bizarre or impossible to some researchers, but it's worth remembering that the labels commonly used in Western scholarship have never been the only option. Consider the work done by Nicholas J. Reo and Laura A. Ogden, who interviewed Anishinaabe tradition bearers in what is now called Michigan, USA to learn more about Anishinaabe perspectives on so-called invasive species. Individual interviewees expressed varying understandings about their responsibilities towards these plants and animals, but the authors noticed that, in general, "Anishinaabe tradition bearers are more concerned about an 'invasive land ethic'" (like the imposition of colonial systems of property ownership) as opposed

64. Natasha Myers, "Becoming Sensor in Sentient Worlds: A More-than-natural History of a Black Oak Savannah," in *Between Matter and Method* (London, UK: Routledge, 2020), 75.

to "invasive species."[65] For these interviewees, the label of "invasive" did not sufficiently attend to the relationships between creatures, places, and histories; they wanted to think about broader cultural stories. The nuances of invasive species relationships are beyond the scope of this dissuasion, but Reo and Ogden's interviews point to a relevant imperative: we need to re-consider specific names, but also the universalizing and individualizing structures that limit our understanding of other creatures. We need, I think, new language practices that reflect different land ethics. Such practices are unlikely to replace the language we have—many scientific naming practices are here to stay, and they can be useful—but enriching our language can nonetheless help enrich our engagement with others. Surely we can re-think how we name communities and hold multiple practices of description. After all, our language is essential in our research with our non-human neighbours—and equally essential for times of environmental change, struggles against colonial power, and emerging alliances between different kinds of peoples.

65. Reo and Ogden, 1449.

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Introductory Note: Disgust, Discomfort, and Dwelling with Fall Webworm Caterpillars

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In her award-winning book *Birds Art Life,* Kyo Maclear (2017) follows an experienced bird watcher through Toronto's High Park. She's is a well-known local author but relatively new to birdwatching, and she meets with the man for a few months to learn more about birds. On a September afternoon, the two encounter a baby goldfinch, fallen to the ground; both the chick and the chick's parents show unambiguous signs of distress. Maclear's heart reaches out; she wants to offer aid to the small bird. Her companion disagrees. He knows the bird will die, but makes a remark about the survival of the fittest. And so Maclear holds back, admitting that she doesn't want to be judged as "sentimental" or "too predicably touchy-feely, or God forbid, *female"* (p. 193, emphasis in original).

At first glance, Maclear's encounter with a baby bird in *Birds Art Life* and my encounters with webworms in "Disgust, Discomfort, and Dwelling with Fall Webworm Caterpillars" may seem quite different: we write about different creatures, and I've never been in a position to save (or not save) a tiny caterpillar. Yet, both Maclear and I wonder about the role that our feelings might play in multispecies relationships. I'll admit that while drafting this paper, I often found myself making rather self-degrading comments to my peers. "It's a very squishy paper," I'd say with a laugh. Or: "I'm just writing about my feelings," and "sometimes I worry it's all fluff." I find my own insecurity intriguing because I thoroughly enjoyed writing this paper. It felt

important to me, even if I struggled to explain why. I felt like I was learning more about my own humanity. But I wasn't sure it would be meaningful to anyone else; I was worried that I was "too predicably touchy-feely," that my work was sentiment without substance.

My anxiety is not entirely unwarranted: writing about feelings, emotions, or affects can become too uncertain, losing any clear material grounding or political stakes. But the outright dismissal of feelings is also political, and Maclear's evocation of gender is not incidental. As the feminists teach us, "white Western patriarchal societies"—including Canada—are structured by "social hierarchies and dualities" that invent and uphold binaries that separate and rank peoples, cultures, and ecologies, claiming some (white, western, straight, males) are more worthy of life than others (Black, brown, eastern, queer, women) (Öztürk, 2020, p. 707). Such social hierarchies are not inevitable or universal, and they exert considerable force on how social relations can be enacted in western societies, manifesting themselves in violent policies and cultural norms, both past and present. Police violence, red lining, residential schools, medical racism, the erasure of queer identities, indifference towards sexual assault, and the devaluing of non-humans' lives can all be traced back to such hierarchies, and our feelings have also not escaped western society's propensity for ranking. Often placed in a binary with logic and reason—the "superior features" associated with men—feelings and emotions "are perceived as inferior properties, and they are ascribed to women" (Öztürk 707). According to this train of thought, logic and emotion are entirely separable, and to be emotional is to be feminine; to be feminine is to be inferior and less deserving of respect. Perhaps it is not surprising that both Maclear and I—both women-identifying writers—worry about being perceived as "too predictably touchy-feely."

Yet, when I acknowledge the political stakes of feeling, I must also acknowledge that labelling my feelings as "feminine" and dismissible makes me complicit in a much broader system of power. I am interpreting my body through a system of beliefs that does not support my wellbeing or the wellbeing of others. I am accepting a worldview that does not honour my full humanity, a worldview that tells me to repress part of myself in order to conform to a system which continually perpetuates harm to humans and non-humans alike (though, importantly, not equally.) Like Maclear, "sometimes I worry about our collective hearts" (p. 197). She openly regrets ignoring her heart and repressing her feelings; in this paper, I am trying to learn from her mistake and to attend to feelings.

This paper was first inspired, at least in part, by my own conflicting feelings about fall webworm caterpillars, particularly as they unfolded over the summer of 2022 and 2023, when I developed a regular habit of visiting and tracking the nests. Part of me desperately wanted to see the caterpillars as beautiful, but I struggled. They were certainly interesting, and watching their webs shift and expand over the course of a season was rather fun. But I also found them creepy, even gross. I knew webworms didn't deserve my aversion; they hadn't harmed me. They were just living their lives according to their own ways; they didn't need to meet any human standards in order to be worthy of respect. And so, I was suspicious of my own discomfort, and my first reaction was to tell myself my feelings didn't matter, that they weren't important. And yet, pretending not to be uncomfortable didn't seem like the right thing to do. I opted for another approach: if followed my discomfort, what could it teach me? What could I learn about being human and forming relationships if I was honest about how I felt?

On the one hand, this paper is quite specific: it investigates what it means to *feel disgusted by* fall webworm caterpillars. It analyzes periodicals that mention these creatures by

name and highlights their reputation as "unsightly creatures." On the other hand, this paper also delves into insect-disgust and the treatment of so-called "disgusting creatures" on a broader scale. It examines a few examples where environmentalist scholars and activists erase creatures that elicit discomfort and shame humans who feel discomfort. In these examples, so-called disgusting creatures must disappear, and if they do not disappear, then any negative emotions that they inspire must be quelled. In my view, both of these perspectives prevent us from growing as individuals and forming respectful multi-species communities, and this paper calls readers to do a better job of leaning into their less-that-comfortable feelings. This isn't easy work—if feelings and emotions in general have a tendency to be dismissed, then uncomfortable feelings may be even less likely to garner consideration. Who wants to dwell in discomfort?

Yet, dwelling in discomfort might be exactly what is needed for many of us to become better neighbours to the non-humans in our communities. As Stacy Alamio (2010) explains, when we recognize "that humans are the very stuff of the material, emergent world," we also must accept that "the pursuit of self-knowledge, which has been a personal, philosophical, psychological, or discursive matter, now extends into a rather 'scientific' investigation into the constitution of our coextensive environments" (p. 20). If we accept that we are entangled with everything else, then we must accept that *all* of our humanity is entirely entangled in our ecologies. Our feelings and sensations are very much part of the *substance* of the world; to understand our responsibilities to our ecologies, we must also grapple with the entirety of our humanity, even the parts that we're quick to label as unwanted or unimportant. Feelings and emotions are no less part of our world than logic and reason.

I'm not suggesting logic or reason are unimportant or unvaluable, but they are not the only valuable part of our humanity, and, as this paper will show, our feelings play a significant

role in our relationships with other creatures, even if we've been told that our feelings don't much matter. Accepting and learning more about our emotional experiences with other creatures can broaden our opportunities to connect with them and with our own humanity. I feel that I am a more considerate neighbour to the caterpillars in my community because, in the course of doing this research, I made peace with my feelings and expanded my tolerance for uncomfortable feelings; fall webworm caterpillars still creep me out sometimes, and that's okay.

Disgust, Discomfort, and Dwelling with Fall Webworm Caterpillars

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Abstract: This article follows Fall Webworm caterpillars, and it examines the disgust and discomfort that are often associated with bugs and insects. Fall webworms have been dubbed "aesthetic pests," are often called "unsightly," and they are frequently removed from gardens and green spaces. To unravel these repulsive gestures, this article turns to Sarah Ahmed's discussion of disgust, and it examines two common disgust-reactions that relate to insects. First, it considers how removing "disgusting" creatures from conservationists' publicity campaigns idealizes natural beauty. Second, it questions activists' disgust toward bug-fearing humans, which idealize feel-good relations. Finally, to avoid (re)creating these hierarchies, this article advocates for remaining open and attentive to the many bodily sensations that emerge across bodies when differences meet.

Keywords: Insects, bugs, disgust, critical animal studies, sensing

Disgust, Discomfort, and Dwelling with Fall Webworm Caterpillars

It's late July, and the arrival of nightfall barely abates the summer heat. The air feels bloated, overfull, and so thick that even the light from my cellphone seems sluggish as it fades into the fever dream of the midnight forest. A half-hearted choir of bugs drips through the air as I creep closer to the black walnut tree: I know the path by heart, know these shadows in my bones, and feel the tree's approach. And yet, I jolt when the tree emerges from the forest, the light from my cell phone tumbling across one of the walnut's drooping branches. The limb is entirely encased in white webs; fuzzy worm-like creatures slide in and out of the silken-shroud, crawling over each other in a squishy, squirmy throng. Beneath the webs, the walnut's leaves have turned to skeletons. Every day, the web grows ever-larger, and every day, more leaves wither while the caterpillars bulge. I shiver despite the heat. Anxiety rises from my ribcage, moves through my shoulders. I breathe slowly, intentionally; I look slowly, intentionally. My anxiety pours through my skin, disperses into the air. But despite my urge to step back, to move away, I am surprised to find another part of me speaking to these nighttime crawlers: *Look! You're doing so good! You're growing so much!*

To put it mildly, my nighttime visits to fall webworm caterpillar nests are far from straightforward. I first spotted their webs not long after moving to the Great Lakes region, land protected by the Dish With One Spoon Wampum agreement between the Haudenosaunee and the Anishinaabe Nations, and I've been trying to get to know these caterpillars ever since. I find them everyday for nearly two months, visiting them on their own time—as nocturnal creatures, they're spinning when I'd like to be sleeping— and I spend hours watching them loop and crawl. All the while, my skin crawls too. But I persist in going: as Donna Haraway notes, "visiting is not an easy practice"; it requires a commitment to get to know someone else, "to sense and respond" to another creature on their own terms (2016, pg. 127). But even after weeks of

visiting, I'm filled with a sense of disquiet. I begin to wonder what I might have to learn from these creatures not *in spite* of unease, but by sitting with unease itself.

And so the following article dwells in moments of discomfort, grappling with the nuances of multispecies relations that do not always feel good. Attending to feeling is necessary: by analyzing representations of webworm caterpillars in local periodicals, this article begins by demonstrating that disseminating factual information has failed to engender ecological care for the often-reviled nighttime crawlers. This article turns to disgust theorists to make sense of this failure, and then untangles two common ways of relating to so-called disgusting creatures. The first, often found in traditional conservationist movements, intentionally removes representations of disgusting creatures in media and literature to promote environmental causes; however, it simultaneously recreates a hierarchy that prioritizes beautiful creatures at the expense of others. The second approach, found in more recent environmentalist circles, also (re)enacts disgust—but rather than repelling creatures, it repels human discomfort. This approach, unlike the first, recognizes that all creatures have a right to be seen, but it also risks implying that humans should always feel happy to see them, and so it valorises feel-good relations at the expense of more open, embodied practices of listening.

Examining these two ways of relating reveals how easily hierarchal thinking hides inside good intentions, hindering our ability to form respectful relationships even as we strive to unlearn humancentric thought. To move away from such hierarchies, this article suggests remaining attentive to the many bodily sensations that emerge when differences meet. In other

words, making peace with a multiplicity of feelings may enable us to make peace[1] with a multiplicity of creatures.

To this end, I consider webworms as guides and teachers: they've been here for far longer than I have, living in their own web of multifaceted multispecies relations with birds, bugs, and trees. Although they are leaf-chomping defoliators, the webworm populations here don't hatch until late summer.[2] Just as the trees are preparing to release their leaves for the season, webworms begin to feast, and so, despite the haggard appearance of a web-shrouded oak-limb, these webs barely bother the trees. Instead, they act as shields, protecting the caterpillars from hungry birds and wasps. But my stomach still sinks at the sight of the oak's tattered twigs. I feel offended by these caterpillars, even as I call them teachers. And although the particularities of my nighttime encounter are my own, I'm not alone in my unease; on the contrary, my feelings have been recorded and documented many times over.

1. I use the phrase "making peace" broadly. The verbiage is important: we may not reach a perfect peace with all creatures, but we can take steps to actively (re)make cross-species relationships that do not enact humancentric violence.

2. My discussion of Fall Webworms is place-specific. In much of Europe and Asia, Fall Webworms' defoliating tendencies require more complex engagement.

Figure One

Fall Webworm Caterpillar Nest at Night

Collecting Stories

Sitting with human-webworm discomfort requires embracing "nature-as-lived-experience" (Bowerbank, 1997). Non-humans are not static, untethered creatures; they live in particular places alongside humans who notice and respond to them. Without denying the importance of conventional scientific and academic work, Sylvia Bowerbank advocates turning toward non-academic, local writing, which contains "feeling and knowledge" that can help explain "how and why certain cultural patterns regarding the environment have developed"

(1997). Rather than focusing on abstract fact, Bowerbank encourages researchers to seek out stories of emplaced entanglements, revealing how multispecies relationships unfold in daily life, how they are *felt* and *known* by humans. Her attention to place- and context-specific writings are echoed by the bioregionalist scholars Tom Lynch, Cheryl Glotfelty, and Karla Armbruster; they argue that place-specific literature and art "not only reflect but also influence the ways a culture imagines itself and its place in the natural world" (2012, p. 11); such texts tell stories of specific relationships, and they reveal how humans see themselves in relation to other creatures.

In hopes of better understanding how webworms are experienced, I began searching for texts about these nighttime creatures. Such stories are hard to find; webworm relations aren't a popular topic. Most of the non-academic writing about webworms appears in newspaper articles and gardening periodicals. Even then, references are few and far between. Still, I began to collect these articles: I generally limited my search to the Great Lakes region, as webworms here share a similar lifecycle, and I focussed on articles from the last twenty years, hoping to learn about webworms' position in relation to current cultural and scientific understandings. (Texts from the early and mid-twentieth century, for example, are less certain about webworms' harmfulness to trees.) After gathering a few dozen articles, trends began to emerge: most prominently, a shared sense of discomfort that conflicted with scientific knowledge.

Unsightly Creatures

In 2019, a columnist for my city's newspaper, *The Hamilton Spectator,* hailed webworm caterpillars as "nightmarish" (Nadler, 2019). Not far away in Huntsville, Ontario, the *Bracebridge Examiner* described the webs as "badly strewn Halloween decorations" (Hartill, 2015) and *The Detroit News* reported "webs are very big and unsightly" (Dluzen, 2020). The

final description—"unsightly"—is especially popular in the local newspaper articles and gardening columns: the *Toronto Star* called the webs an "unsightly mess" (Lockhart, 2021), and *Orillia Matters* writes that the caterpillars are "interesting, albeit unsightly, insects" (Hawke, 2020). The term also makes a few appearances in an article published by Canada's national news corporation, the CBC (Urquhart, 2023).

I find the word *unsightly* suitable because it centers relation. Stemming from *sight*, *unsightly* draws attention toward the act of seeing and the seer. Dictionary definitions include phrases like "unpleasing" or "displeasing to the eye," suggesting that the *unsightly* is not undesirable in and of itself, but becomes undesirable through its relation to the seer (Oxford English Dictionary, 2023; Online Etymology Dictionary, 2017). *Unsightly* thus seems an apt descriptor for the webworm-relations found in newspapers and public forums, where webworms' offences do not arise from their environmental impacts or capacities, but from their appearance to humans. Note, for example, a concerned citizen writing into *The Master Gardener* column in a Pennsylvania newspaper: "What are those webs I'm seeing on the ends of tree branches? Are they harmful? How do you treat them?" ("Ask the Master Gardener," 2021). These three questions fold into each other seamlessly; the answer to the first doesn't change the trajectory of the discussion. The writer wants to know how to "treat" the webs before learning anything about them; regardless of their ecological import, the webworms are intolerable simply because they are visible. This example illustrates a larger trend: these texts assume that humans don't know anything about webworms, but will want to be rid of them regardless. To highlight a few examples: a *Huntsville Forester* article begins by listing the caterpillars' placement in scientific taxonomies, and then mentions "appropriate" insecticides for homeowners (2014). Similarly, the

Waterdown Daily Times claims that the webs needn't cause concern right before advising readers to prune and burn them (Mihalyi, 1988).

Even *Entomology Today*, a periodical that centres the lives of insects, explains that, "despite their voracious appetite for leaves, these caterpillars do not seem to cause significant harm to otherwise healthy trees. So, fear not for your landscaping. But fall webworm nests are unsightly and many property owners are anxious to eliminate them. Thankfully, this insect has been a target of pest control professionals since the late 1920s" (Walker, 2017). The swift shift from *harmless* to *elimination* leaves no space for readers to ponder why these webs are dubbed "unsightly," how unsightliness leaves them "anxious," or if removal is an appropriate response to these uneasy feelings. On the contrary: by referencing the "many property owners" who feel similarly, and the "professionals" who mediate these human-insect relations with poison, this article normalizes uneasiness and removal. Further, the article tells readers that these removals have been ongoing for "centuries"—removal is the way that things have always been done; perhaps it's just what one does. There is nothing strange about removing these aesthetic pests; in fact, a reader might be forgiven for believing it would be strange *not* to remove the caterpillars.

Figure Two

Sprawling Fall Webworm Caterpillar Nest

Yet, deciding who or what is "strange" is no simple matter. From one perspective, Fall Webworms aren't "strange" at all: they've lived in the Dish with One Spoon for far longer than humans. However, they are often (mis)recognized and (mis)treated as strangers. Most obviously, many human peoples are oblivious to their caterpillar neighbours, but I find it helpful to turn to Sara Ahmed's (2004) understanding of *the stranger*, which is more nuanced than unfamiliarity. She explains that "strangers are not simply those who are not known" in any given place, "but those who are… already recognised as not belonging, as being out of place" (p. 21). That is, a group of humans develop assumptions about how a place should look, and strangers'

appearances break the visual norm. Strangers are thus identified by their non-adherence to expectations. Consider: homeowners and park visitors may encounter many plants and animals that they cannot name, and yet they usually assume these beings belong in their ecosystems. Webworms, however, are not seen as yet-unnamed members of the ecological community. Instead, they are labeled as threats, presumed to be disturbers, intruders.[3] The (mis)recognition of webworm's unbelonging gestures towards underlying, unspoken rules about who can seamlessly move through parks, gardens, and nature preserves, and—perhaps more pertinently—it tells us that visual cues play a significant role in such distinctions.

Yet, deciding who is strange isn't only about *seeing*; it is also about *removing from sight*. Ahmed's (2004) discussion of strangeness is nuanced by her work on disgust, which untangles the slide from stranger-recognition to stranger-removal—or, perhaps, from "what is it?" to "how do I kill it?" For Ahmed, disgust involves a "double movement" (p. 85), both intellectualization and action. That is, when I am disgusted, a strange being or object feels "perilously close" and appears as an invader; my understanding of how things *should be* (or, in this case, how the non-human environment *should look*) feels compromised (Ahmed, p. 85). I then respond to this "too-closeness" by pulling away, "creat[ing] a distance" between myself and the other (Ahmed, p. 85). In doing so, I (re)assert my own identity as separate from the object or being—*I am not them*—while also (re)establishing the world as I think it should be—*they do not belong here*. In Sianne Ngai's (2005) words, "disgust strengthens and polices [the] boundary between the self and other" (p. 335). Far from being a passive emotion, disgust is an active process that

3. Many humans—myself included—are still learning to name and engage with the many different non-humans who populate our ecologies. We make honest errors with good intentions. Yet, we also need to be open enough to acknowledge our errors and challenge our assumptions; in the case of fall webworms, education has not led to changed attitudes or actions.

(re)establishes and (re)enforces lines of belonging. Meanwhile, as I enact disgust, I also signal my alignment with others who share my assumptions about the world; disgust "enable[es] a strange kind of sociability" as people share their "exclusion" of the disgust-object (Ngai, p. 336). By identifying and dispelling the outsider, I define myself as an insider who can be trusted to continuously (re)establish the status quo through an adherence to visual norms— my disgust reactions thus affirm who I am, who I am like, and who I am *not* like. Disgust-reactions are "both the demarcation and enforcement of the boundaries" of communities (Ahmed, p. 21).

But whether individual or communal, such disgust-reactions generally centre conceptual worlds, and not physical assaults. In a recent study on emotional taxonomies, researchers Pamela Marie Taylor and Yukiko Uchida (2022) describe disgust as "a sense of revulsion" towards someone who "violates social rules" or norms, whereas fear often emerges in relation to physical harm and a desire to keep the self safe (p. 347). A disgusted person can remain unconcerned for their physical safety or the safety of others, but they still feel threatened because their sense of how things *should be* has been shaken. Further, while many forms of fear or anxiety can be amorphous, disgust has a clear object: there is a (mis)recognizable stranger who serves as a locus for the disgust reaction, a transgressor who can be removed in hopes of "restor[ing] order" (Taylor & Uchida, pp. 347-348). Perhaps unsurprisingly, disgust is far more likely than fear to provoke violence, as individuals or communities seek to protect the integrity of imagined worlds (Lee, 2013, p. 278).

Understanding webworms as (mis)recognized strangers who elicit disgust reactions helps to explain the flurry of tree-chopping, web-burning, and chemical-spraying that follows caterpillar-spotting. If locals were fear-driven and concerned for the safety of the trees, they could be reassured by the information that webworms have been munching down on late-

summer leaves for centuries without wiping out the tree population. They might even feel obligated to leave the caterpillars alone, as common removal tactics can damage other forms of non-human life. But gardeners and park visitors aren't afraid of the caterpillars: they're disgusted. Facts about webworms' ecological impact doesn't alter their impression of how a forest or garden should look, and so is unlikely to alter their perception of webworms' unsightliness. Indeed, I've worked with webworms for a few years now, and I still find myself cringing beneath the tree.

So what does a person do with the feeling of being offended by webworms? How does a person handle the urge to repel certain creatures if knowing more facts about them doesn't seem to matter much? If I want to live in more respectful relations with other creatures—and I do—how might I live alongside these caterpillars and the disgust they elicit? More broadly still, how might a person live with the unsightly? I have been writing about webworms specifically, but many creatures—especially bugs and insects[4]—find themselves in similar situations, recognized as not-belonging, and removed to restore an idealized image of natural or cultivated spaces. There are exceptions—butterflies and ladybugs are generally adored—but the overwhelming majority of insects receive no such praise. Instead, Jussi Parikka (2020) writes, most insects "remain radically nonhuman" (p. xxxiv). Cristopher Hollingsworth (2918) similarly argues that the "insect society has always suggested Otherness" (p. 152). In his much-cited work "The Biological Basis for Human Values of Nature" Stephen R. Kellert (1993) names a number of reasons for insects' possible outsider status, including their "vastly different" ways of moving

4. Bugs and insects are not identical categories, although they are often used interchangeably in popular culture, and both bugs and insects are often deemed disgusting.

through the world, which may appear "alienat[ing]" (p. 58), causing many humans to place insects outside of the realm of empathy.

I'm wary of the universalism of these accounts, but there's little doubt that insect-disgust permeates Western popular cultures, wherein "bugging" someone means annoying them, ads for "pest control" abound, and television and movies often use bugs as a sign of decay, death, or horror. Environmental activism and writing aren't immune; many of us trying to develop more respectful relationships will need to decide how we will deal with discomfort and disgust in our own work.

Hide The Bugs!: The Failure Of Trickle-Down Care

However, instead of confronting disgust, many conservationists have tried to ignore it, and instead they capitalize on nature's visual appeal to promote environmental causes. Studies determine which species are considered attractive to a broad public, and these creatures—the cute, the beautiful, the human-like—become "poster animals" for conservation programs, while less visually appealing creatures are absent, left unseen and unspoken in publicity efforts (Small, 2012, p. 41; Albert et al, 2018, p. 9). Conservationists themselves may not believe that "poster animals" are more deserving of life, but this strategy offers a focal point for public attention amid a breadth of environmental issues. Unsurprisingly, people "more willingly fund conservation programmes" if they are "attracted" to the publicised species (Albert et al, 2018, pg. 2); few would eagerly donate directly toward the preservation of the creepers and the crawlers. But, as Ernest Small (2012) explains, if environmental activists are able to "preserve the habitat of the [publicly] targeted animals... numerous other species within the same habitats will also benefit" (p. 41). In other words, the unsightly creatures left out of publicity efforts

would, in theory, be saved thanks to their proximity to the "poster animals" that attract attention and money, just as the "poster animals" benefit from ecosystems filled with a diversity of creatures.

This strategy is well-meaning, and in a media landscape where environmental issues tend to go unnamed, any coverage might seem like a net positive. Still, the theoretical benefit-through-proximity is not guaranteed. Foregrounding the care of some non-humans can become a detriment to others. To return to webworms: many of the newspaper articles I previously referenced promoted methods for webworm removal that are "safe" for visually appealing members of an ecosystem—using, for example, bird-safe pesticides. However, many birds also rely on webworms as a food source, and so the removal of webworms is nevertheless detrimental to their wellbeing. Such partial and skewed ecological care becomes only possible when ecosystems are not seen in their entirety. Focussing so narrowly on the attractiveness of select individuals, these strategies fail to represent how creatures need each other.

For Lucy Lippard (1997), attending primarily to a place's "pictorial" dimensions leads to a "landscape" view of nature, wherein the non-human world is "seen" as a "scene," an image to be observed and valued from a distance (p. 8). When non-human societies are considered scenery, they are rendered passive, treated as objects for human happiness. Those who fulfill this aim are permitted to stay in the frame, but those who do not provoke such happy emotions are easily erased. Further, fixating on an aesthetic of a lush, leafy wilderness feeds a false nostalgia, a longing for a past, imagined time "without pollution, without impurity... when the world at large is *truly beautiful*" (Shotwell, 2016, p. 3). But this world is illusory; its true beauty imagined: the repetition, circulation, and exaltation of certain images affirms them as beautiful. Conservationists' publicity campaigns are part of this reaffirmation; as they spotlight certain

creatures as attractive, they confirm standards of (un)attractiveness. Or, to return to my collection of webworm articles: when periodicals assume that readers will think that webworms ruin their trees' aesthetic appeal, they send a message about which aesthetic forms readers should recognize as appealing—and which should be recognized as strange, disgusting, and not-belonging.

Further, Alexis Shotwell (2016) reminds us that idealizing a "truly beautiful" world comprised only of "truly beautiful" creatures can stop us from caring for those creatures who actually live all around us (p. 4). In the words of Kanien'kehá:ka scholar Sandra Styres (2018), "whether someone chooses to acknowledge it or not, we all exist in relationship to each other" (p. 28); removing the unsightly from the line of sight does not mean we stop relating to them, only that our relations become more obscure, more difficult to confront. Perhaps this is why Anishinaabe scholar Nicholas J. Reo (2019) advocates for Indigenous knowledge practices that foreground actively "participating in and tending to relationships" rather than settler tendencies that get stuck in abstraction, wondering what relationships "might look like" (p. 68). Aesthetic-focused "landscape" views of nature stay locked in abstraction, but living out relationships with intention requires acknowledging that no one is *apart* from our environments; each one of us is *a part* of an unfinished scene alongside a multiplicity of shifting characters, none inherently more valuable, more strange, or more worthy of attention.

Love The Bugs!: Confusing Care With Correct Feeling

Instead of sweeping creepy-crawlers from sight, other scholars, environmentalists, and activists have been putting them centre stage. Bestselling books like *Silent Earth: Averting the Insect Apocalypse* (2021) may not be about webworms specifically, but they remind us that many bugs and insects—even unsightly ones—cultivate the conditions that make human flourishing

possible: they pollinate, decompose matter, aerate soil, and provide food. Such texts can be informative, but gathering more information about other creatures does not necessarily translate into better treatment, especially when they centre these creatures' usefulness to humans, reinforcing the assumption that insects are here to serve us, please us, and to be seen (or not seen) according to human need.

Hoping to move beyond humancentric hubris, other writers call for greater equity across species, claiming that all critters have a right to take up space—and be seen doing it—regardless of beauty or usefulness. For example, in his work in the American Southwest, Tom Lynch (2008) strives to develop an "ethical commitment" to the desert ecosystem that goes beyond "an aesthetic appreciation" (p. 13); he suggests that this commitment "must include some sympathetic understanding of, if not outright affection" for overlooked and reviled insects (p. 142). But the difference between "sympathetic understanding" and "affection" is unclear, although both feeling and knowing repeatedly emerge in his book.

A more direct, prescriptive approach is taken up by Hannah Gunderman and Richard White in their paper "Critical Posthumanism for All: A Call to Reject Insect Speciesism" (2020). Like Lynch, these authors long for insect-affection, and they argue that insect-disgust is largely a constructed phenomenon. "Our imaginaries," they write, "inform our values and attitudes that are used… to justify our actions regarding how we engage with others" (p. 490), and so shifting cultural narratives will be an essential step toward shifting our relations with other creatures. Indeed, insect imaginaries are often far from ideal; as I mentioned earlier, insect-disgust saturates popular media in the west. For Gunderman and White, nurturing a sustainable future for human and non-human creatures will require re-shaping these imaginaries and working toward "an honest and empathic restructuring of our normalized relationships to insects" (p. 493). And while

restructuring norms may seem like a lofty goal, Gunderman and White offer several personal anecdotes to illustrate their arguments. Their paper opens with a short story about Gunderman finding a bug in her office. Excited, she snaps a photo to share on social media, writing: "As a leftist ethical vegan with several like-minded folks on my friends list, I expected to receive many positive comments and 'likes' on the post" (p. 489). Gunderman's eagerness to share her insect-encounter demonstrates her belief that bugs deserve to take up space, and while this might seem counter-cultural, she expects her views to be mirrored by the "like-minded folks" in her friends' circle (p. 489). That is, she enters her online encounter with expectations—she holds assumptions about *the way things are done* in her community—and awaits insect-joy. Unfortunately, Gunderman's friends fall short of her ideals: "to my surprise, within seconds I had dozens of condescending comments calling the creature 'disgusting'" (p. 489); Gunderman experiences a moment of alienation from her community as their actions deviate from her expectations of shared values.

Gunderman then repels their views: she declares herself "appalled" by their reaction and distances herself from their insect-repelling habits, identifying herself as being *not like them* (p. 489). Thus, Gunderman also enacts disgust—not toward the bug, but toward the commenters. Ahmed's work once again proves helpful, as she explains that "some disgust reactions name their disgust at the way in which disgust has stuck to the bodies of some others" (2004, p. 99); this disgust can be "an element in a politics that seeks to challenge 'what is'" because it calls normalized responses into question (p. 99). As Gunderman treats the commenters' views as repulsive—as views that do not belong within her community—they no longer seem given or inevitable. Put differently, when *what seems normal to me* and *what seems normal to you* are

misaligned, the concept of normal begins to collapse, and we have the opportunity to adjust our expectations for collective living.

Yet, I find myself searching for nuance. Gunderman distances herself from her friends, but doesn't mark where the crucial difference between them arises. Is she disgusted by their desire to kill the bug, by their feelings of being repelled, by their lack of joy at the bug's presence? What is her motivation as she calls them out? There is always a risk that disgust aimed at peers becomes an act of performing moral superiority; although I believe that Gunderman is acting sincerely, the disgust she models for her readers may not be helpful. Research tells us that many people exaggerate their disgust in hopes that it will "serve as evidence of [their] righteousness"; they repel disgusting objects, feelings, or views with more force than they actually feel in hopes of associating themselves with a "correct" set of beliefs or feelings (Lee, 2013, p. 277). Such self-vindication easily becomes a form of "ideological purity" that retreats into binary thinking and hierarchical categories (good and bad emotion, good and bad environmentalists) that have more to do with reasserting our identities—*I am not like them*—than reassessing our material relations (Shotwell, 2016, p. 3).

Ahmed similarly suggests that disgust has its limitations, even when directed towards harmful norms: "disgust as an affective response might… not allow one the time to digest that which one designates as a 'bad thing'… Critique requires more time for digestion" (2004, p.99). The snap judgements and repulsions that characterize disgust reactions are effective for asserting a specific worldview, but they aren't terribly helpful for facilitating dialogue or contemplating the complexities that emerge when differences meet. On the contrary: disgust reduces complexities to belonging and unbelonging, to me and not-me. But no matter how attentively we assess ourselves and our relations, we will find ourselves spilling out of our structures, our

borders and binaries. In Alexis Shotwell's (2016) words, "the world always exceeds our conception of it" (p. 4), and labels "good" and "bad" often fail to capture the experience of living in dynamic relations. After all, how does one classify *correct feelings* when meeting another creature? Or a webworm nest? What if I believe that bugs ought to be appreciated, but my skin still crawls during nighttime visits to a walnut tree? Are my feelings *wrong*? Surely insect-disgust is not wholly inevitable, but it seems oversimple to suggest that all uneasy feelings should be blamed on ingrained norms and then cast away. As Kellert (1993) notes, uneasy feelings like "aversion… and antipathy" are just as much a part of ecologies as awe and wonder (p. 57).

The second anecdote shared by Gunderman and White (2020) illustrates my concern: Gunderman finds herself in an elevator with a mosquito and writes: "my mind immediately categoriz[ed] the creature as a 'pest,' my first thought was one of disgust and dread, as I loathe the swelling and itchiness…that accompanies a mosquito bite" (p. 500). Notably, Gunderman doesn't harm this mosquito, but she finds her "disgust and dread" concerning. "My reaction to this mosquito was speciesist in nature," she explains, "as I had only a few hours earlier hugged my dogs, whom I deemed to be acceptable inhabitants of my personal space" (p. 500). On the one hand, she recognizes how her urge to pull away might (re)affirm entrenched beliefs about spatial belonging: she recognizes the mosquito as someone who does not belong, and she feels the urge to repel the creature. She then recognizes her pattern of recognition and is disgusted by her own disgust. She doesn't rid herself of disgust, but rather shifts its locus, locating it *within herself*. Her emotional reaction becomes the disgust-object, which allows her to challenge her own culpability in commonplace narratives that prioritize human life over other forms of existence.

Yet, I'm not sure that mosquito-avoidance is best described as *disgust* or *speciesism*. Disgust emerges from transgressed norms and tends to create righteous aggression towards the norm-transgressor, whereas physical harm is more likely to elicit fear and protective impulses (Taylor & Uchida, 2022, p. 357). Gunderman's response centres the material preservation of her body, and she hopes to avoid "swelling and itchiness" of a bite—a tangible threat in this situation (p. 500). To their credit, the authors acknowledge that Gunderman might understand her discomfort differently if she faced the threat of malaria or another illness (2020, p. 500), but this allowance only creates more questions: how much harm needs to be risked before it morally justifies feeling anxiety or causes a person to pull away? Policing harm seems a perilous task, and sometimes distinguishing between disgust and fear is simple, other times these feelings emerge together. Such cases require pause.

Gunderman and White don't advocate for embracing poisonous spiders, and they agree that an individual might well be afraid of such creatures; nevertheless, they also lament that people "often imprint these fears onto non-venomous species who visually resemble the [unsafe] species, either *avoiding* these creatures or, worse, *killing* them" (p. 494, emphasis mine). Here, both *avoiding* and *killing* creatures who mimic dangerous species are negative actions—one is simply worse than the other. Impulsive violence needs to be challenged, but I don't think that avoiding creatures who present themselves as potentially harmful is humancentric. On the contrary, taking seriously the information that another species is communicating—even if that information is *I am not safe*—is a practice of recognizing non-human agency. "A truly respectful understanding of rationality," writes Cherokee scholar Daniel Heath Justice (2018), "also means respect for other people's capacity to cause each other harm" (p. 97). So while Gunderman regrets responding differently to her dogs and the mosquito, I think she should respond

differently to them. They are different beings who have different relationships to her. Her dogs want love; the mosquito wants blood—they tell her this through movements and sounds, just as many creatures use unique forms of expression to communicate their intentions and capacities.

Further, I worry that fixating on feel-good relations may become yet another way to retreat into an illusory *truly beautiful* world (where everyone always gets along)—rather than relating to creatures as they actually present themselves (Shotwell, 2016, p. 3). Even in his search for insect-affection, Lynch (2008) is wary of the tendency for environmental writers to care "not for what [non-humans] are, but what they can be made to symbolize" within settler societies (p. 152). This is especially dangerous territory for settler scholars, who are all too accustomed to idealizing some lifeforms over others. Non-Indigenous scholars must always be "reckoning with… being a guest, a trespasser, and a colonizer" (Kanngieser & Todd, 2020, p. 390). Settlers like myself must remember that we are latecomers; we don't get to decide what it means to belong here or how belonging should feel. If we insist that all beings should be unambiguously embraced in all spaces, we take for granted that belonging was ever ours to determine.

Being With Bugs: Dwelling In Discomfort

Rather than aiming for *correct feeling* or even *correct relationality*, I am better served by attending to the feelings and relationships that are already here, remembering that these creatures "have the capacity to consent to or refuse collaboration" with human neighbours (Kanngieser & Todd, 2020, p. 392; Reo, 2019, p. 70). Consent and collaboration are ongoing processes that shift with time and growth, and if I want to grow a relationship with another creature, I must pay attention to specific material entanglements in every moment rather than relying on initial

expectations. To return to the forest: I don't expect that webworms share my understanding of multispecies relations, so I need to pay attention to how they express themselves and their relational needs. If nothing else, I need to ensure that my presence doesn't interfere with their ability to care for themselves. Past visits have taught me about webworm boundaries: when I give the critters an armlength of space, they are content to continue their weaving under my attention, but if I get too close, they will begin a collective defense move, twitching in sync, shaking the nest. In such moments, I need to take the hint and step back so they can feel safe again. After all, webworm nests aren't just feats of string work—they're shelters for feeding, and respecting their boundaries doesn't require aesthetic appreciation. My feelings about webworms are nonetheless embedded in this place and my body; they can orient me, help me pay attention, but they are not abstract judgements of correctness.

Potawatomi botanist Robin Wall Kimmerer (2013) models this kind of dynamic, sensory relationality when she goes to harvest wild leeks, hoping to be fed by their generosity while also maintaining a respectful relationship to the plants. To do so, she follows the practices given to her by her Indigenous elders: she introduces herself to the leeks, states her intentions, and then asks permission to harvest some bulbs (p. 175). Sitting close to the leeks, trowel in hand, she attends to their response:

> I must use both sides of my brain to listen to the answer. The analytic left reads the empirical signs to judge whether the population is large and healthy enough to sustain a harvest, whether it has enough to share. The intuitive right hemisphere is reading something else, a sense of generosity… or sometimes a tight-lipped recalcitrance that makes me put my trowel away (p. 178)

Kimmerer does not presume to know the outcome of her meeting from the outset. She's honest about her desires, but she prioritizes attending to the plants' response. But although she doesn't know what the leeks will say, she does know how to listen, and when she senses the leeks' initial "recalcitrance," she knows it is not a sign of her poor relationality, just as sensing their later "generosity" is not a measure of her moral merit. Rather than assessing the correctness of certain feelings, she considers how her feelings present themselves in her conversation with the plants, while also remembering her scientific training, traditional knowledge, and her commitment to treat the leeks as "persons vested with awareness, intelligence, spirit" (p. 183). She leans into these interconnected knowledge forms, and on her first visit, she leaves the leeks alone, but when she returns weeks later and finds the bulbs welcoming, healthy, and giving, she walks away with a basket full of food and a heart full of gratitude.

Kimmerer's honourable harvest is a reminder that the richness and complexity of multispecies relationships requires an equally rich "practice of sensing" (Kanngieser & Todd 2020, p. 390). For Zoe Todd and Anya Kanngieser (2020), sensing is a whole-body process that is "self-reflexive," and "hyperlocal" (p. 390)—rooted firmly in the *here* and *now*. As I engage with others through my senses, I must look to the particularities of my body and its enmeshment with my immediate surroundings, including many histories—my own and others. This "practice of sensing" takes the word "sense" in all of its various meanings, turning me toward the ecologies that are beneath my feet—or drooping above my head—and those under my skin. That is, sensing requires attending to physical senses (what forces, expressions, or lives am I able to sense?) and habits of sense-making (how do I interpret other creatures' expressions?) while also unearthing taken-for-granted norms (what seems sensible?). These senses must be understood in

relation to one another: coming to "know in more sensitive ways" means experiencing my body's inseparability from my assumptions about how nature *should* look or how I *should* be and my entanglement within a myriad of non-human expressions that are actively shaping my sense of the world.

If disgust asks me to either reject other creatures or to reject part of myself, I will not understand how my practices of sense-making influence my relationships. Some habits will need to be unlearned, but I cannot do this until I am willing to be with discomfort, acknowledging that such feelings are not simply a matter of my individual choices or worthiness. On the contrary: the emergence of sensations between creatures troubles the boundaries between *me* and *not-me* that disgust so often polices. Our physical and feeling worlds come into being through each other. That doesn't mean we become the same: I will never know how it feels to be a webworm or to belong to a squishy swarm of night-weavers, but I can direct my senses toward them and trust my body's ability to sense their presence in my world.

As I stand beneath the walnut tree, staring at a drooping, web-shrouded branch, webworms still provoke disquiet. But as I feel the anxiety blossoming in my chest, I notice other sensations too: I am curious about these creatures, and I celebrate the continued growth that I've witnessed as I make regular trips to the nest. All of these things can be true at the same time, the midnight air—already overfull of humidity, summer heat, and bug songs—holds all of my feelings too, even the parts which feel incongruent. My sense of the world expands as I embrace a wider sense of sensations; I learn how to live amid a multiplicity of creatures as I learn how to live with the multiplicities inside myself. By leaning into sense, I learn more deeply about my capacity to care, about my body's ability to hold space for difference. The unexpected consequence of learning to live alongside webworms has been learning to live alongside myself;

I begin to understand Styres' (2018) assertion: moving "beyond the boundaries of… colonial ideologies" requires not only different understandings of land, but also different "understandings of self-in-relation" to other beings (p. 35). How can a person relearn how to *be with* creatures without learning to *be with* themselves? Perhaps the slide between "what is it?" and "how do I kill it?" can be interrupted by extending our initial curiosity to our own persons—not only do I ask "what is this creature?" but also "what is this sensation emerging in my body?" and "who am I in relation to this being and these sensations?" Learning to care about creatures doesn't only require external actions, but also internal stretching. Or, perhaps, the mirage that separates the internal from the external fades. The more I sit with webworms, the more I'm learning to live alongside discomfort in both my physical and psychic landscapes; after all, they have always been the same place.

Figure Three

Fall Webworm Caterpillar Nest in Sunlight

Conclusion

The relationship between feeling and ecological responsibility is wrought with complexities that exceed the realm of a single paper or case study. Nevertheless, attending to the feelings that emerge within these relationships is necessary. As in the case of webworm caterpillars and other unsightly creatures, scientific fact alone cannot explain our responses or responsibilities to other kinds of beings.

Yet, as this article has shown, some environmental movements and scholars have attempted to push aside feelings of discomfort by removing representations of disgusting creatures from media and literature. For others, discomfort is marginalized through the moralization of emotion. In contrast, this article has remained attentive to feelings of discomfort and analyzed disgust reactions, offering the opportunity to better understand the relationship between cultural narratives, other species' lifeways, and our own bodies. Listening and learning from different sensations within ourselves might allow us to understand our own positions within multi-feeling, multi-sensing ecologies, to move away from hierarchal thinking, and to create communities rooted in respect for all creatures.

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Introductory Note: Reading and Writing with Fall Webworm Caterpillars

The possibility of non-human reading and writing sparked my interest in the early years of graduate studies. I didn't just want to write *about* other creatures; I wanted to write *with* them. I wanted to think about their expressions in the way I thought about other books and stories I loved. Further, the theoretical possibilities for non-human or more-than-human writing seemed exciting: if we could conceptualize non-human literary practices, what would that mean for our relationships with each other. For our literature? Would we need to re-imagine our citation practices? Could we imagine co-authorship?

I tried to elucidate this possibility through several different venues: I wrote about non-human storytelling in a paper for my comprehensive examinations, and then again for a conference presentation for Animal History Group's summer conference, and then once again for a guest lecture in an undergraduate class in the fall of 2024. Each time I revisited these ideas, I followed slightly different threads; for my comprehensive examinations, I analyzed Edward Chamberlain's essay "Hunting, Tracking, Reading" and imagined non-human tracks as a kind of writing that could be read.[1] At the Animal History Group conference, I considered how non-human tracks communicate histories, inviting us to learn about a species' evolution and an individual creature's past. And when I returned to these ideas for the final time, I spent time considering non-human tracks as patterns and learnt practices.

The research paper I present here is an amalgamation and expansion of my previous projects; it contains all of the above threads in one way or another. Yet, I must admit that this

1. Edward Chamberlain, "Hunting, Tracking, Reading" in *Literacy, Narrative and Culture*, ed. Jess Brockmeier, David R Olson, and Min Wang (Oxfordshire: Routledge, 2013).

paper is perhaps less ambitious than I originally intended. Quite frankly, the more I tried to write about reading and writing, the more the terms fell apart. What does it actually mean to read or to write? How do we understand these terms, especially when literary practices intersect with systematic forces and histories of oppression? Just as the word "colony" has never been neutral and the word "unsightly" intersects with assumptions about natural beauty, so too "reading" and "writing" are historically and culturally positioned. To contend with reading and writing required more than contending with a single dictionary definition; I needed to think about how these terms have been used, about the assumptions and implications they carry.

A significant portion of the following paper is dedicated to acknowledging some of these histories and thinking about the political stakes of the terms "reading" and "writing." Some of the topics raised in this section of the paper resonate with previous discussions. The concept of civilization is relevant to both the "colony" and literacy, and hierarchal thinking is also critiqued in this paper. That said, I have not exhausted these topics, and I am not going to pretend that I have provided anything resembling a complete history of reading and writing. On the contrary, I remain humbly aware that much of my analysis here only skims these literary practices. Would this research have benefited from mentions of Ancient Egyptian hieroglyphs or Sumerian cuneiform? Should I have gone back to Plato or traced the history of the novel? Perhaps. Or perhaps not. Sometimes, there is too much history, too much theory all woven together. I picked up the threads closest to me and tried to stay focussed; that is, I wanted to acknowledge the stakes of terms like "reading" and "writing" without losing sight of the non-human creations that surrounded me. I often found myself in something of a balancing act, trying to consider how these words have bolstered humancentric and Eurocentric thought while still attending to caterpillars, who do not rely on humans' cultural narratives, (even as human decisions impact

their lives). As anthropologist Anna Tsing explains, "it is hard to find a place where humans are not relevant," but that doesn't mean that humans are the "key players" in every story;[2] could I tell a story of reading or writing without making humanity the main character, while still acknowledging the consequences of humans' actions? The task seemed rather daunting.

Still, I wanted to think about reading, writing, and webworm caterpillars, and I wanted to think about them together. Drawing primarily on Linda Hogan's *Dwellings*,[3] I have troubled these definitions and questioned the intentions behind them, observing how some academics' desire to find formal definitions for words like "reading," "writing," and "language" have worked against the formation of respectful relationships. To be clear: definitions in and of themselves are not bad; on the contrary, they allow us to communicate. But they can also be used to exclude, and by forever creating new boundaries for "real writing" or "real literacy," past scholars, thinkers, and writers have risked "obscuring the real issue, that of how we treat other living beings."[4] That is, while I hope this paper invites us to re-think literary practices, I also hope that some of the thoughts that I have shared here draw attention to reading and writing as relational activities. Rather than asking: "what does it mean to 'read?'" perhaps we should begin to ask "how does our definition of reading connect (or separate) us to our human and non-human neighbours?" Once we can learn to answer that question, perhaps we can approach another: "what kind of definition would help us strengthen and support our human and more-than-human connections?"

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2. Anna Tsing, "More-than-Human Sociality: A Call for Critical Description," in *Anthropology and Nature*, ed. Kirsten Hastrup (New York: Routledge, 2014), 33.

3. Linda Hogan, *Dwellings* (New York: Norton & Company, 2007).

4. Hogan, 53.

This paper, however, does not arrive at that question. It does not redefine reading, writing, or any such terms. Instead, it wanders around them. It asks questions about them. And, hopefully, it begins to destabilize the definitions that have excluded non-humans for so long, making room for a different understanding to take root. Because, while this paper is critical of some understandings of reading and writing—particularly those understandings that prevail in the western humanities—I still believe there is great value in reading and writing practices. They have shaped my training and helped me to stretch my thinking. I also believe that there is potential for reading and writing themselves to be stretched and, in the process, to become even more valuable to those of us who want to listen to, learn from, and engage with the non-humans who are expressing themselves all around us. This paper points towards that potential, even if it does not offer a final answer. I am hopeful that some day we will have new definitions of "reading" and "writing"—definitions that help steer us towards celebrating other creatures' creations and honouring the knowledge that they inscribe into the world.

The lack of a final answer may be frustrating to some readers, but I do not consider it a weakness of this research paper, because although I am writing about reading and writing specifically, this research is also an example of trying to learn how to *unlearn*—and that is rarely an easy or a quick process. That is, while my research provides insights into certain literary terms and practices, it also documents my attempts to grapple with what I do in the world: I am a reader and writer. I am entangled and complicit in these practices and their histories; I have inherited them, but I also pass them along. How do I understand the stakes of my own work? Are there ways that I can begin to challenge some of the ideas I have learned? These are questions for literary scholars and academics, but they are also questions for people in many different walks of life. In other words, regardless of the stakes of terms like "reading" or "writing," this paper also

invites its readers into a broader imperative: to re-examine the practices that we take for granted, the practices that may structure our lives and feed us, the practices that we may love. Can we be open and honest about their less-than-savoury dimensions or histories? Can we ask questions about them or destabilize them—not with the aim of destroying them, but with the aim of re-imagining their potential? Such work will undoubtedly upset the status quo, but as I have already discussed, the status quo in western societies is generally not oriented towards the development of equitable relationships or respectful communities. By challenging the status quo assumptions that emerge in our own lives, we might begin to shift this orientation and perhaps understand our own potential to contribute to the development of a better world.

Reading and Writing with Fall Webworm Caterpillars

Under the shadow of a midsummer's night, intricate silken threads stretch between the branches of an oak tree, pulling this way and that, crossing over each other to form a densely-woven web, a fall webworm caterpillar nest. Huddled safely beneath this silken weave, a community of fuzzy caterpillars feeds on the oak's leaves, leaving only bare stems behind. A few brave webworm caterpillars slide outside of the shroud and move toward the oak's greener branches, leaving lines of silk in their wake, like a quiet invitation to their nest-mates. *Come this way,* they seem to say. *Come. There is more food over here. See? I have outlined a path for you.*

I, too, feel beckoned. I flip open a spiral-bound notebook, trying to describe what I see, but my notes feel as wandering as the web—parallel threads, caterpillar intentions, land histories. I take a step closer, ducking under branches to get a better view of the caterpillars' creation—and freeze, eyes snapping wide open, staring directly at the bulbous body of a spider dangling no more than a handspan from my face. The spider twirls elegantly, and then her spindly legs pull her body upwards, towards the webworm nest. I follow her path until another web becomes visible—this one a distinct orb formed from razor-thin silk strands arranged with geometric precision. There are two webs here tonight: two web-patterns, two kinds of web-weavers. I make another note in my notebook.

I continue to watch as the spider approaches the webworm caterpillars and begins to pick her way along the webworm silk; the caterpillars move away. It's also possible that the spider is crawling along her own spider-silk hidden amid the caterpillars' threads. Caterpillar silk is thicker and more visible, the strands tightly woven together to form a shield that protects the small critters from predators, but spider silk is more delicate and spread out, meant to trap unsuspecting prey. Both creatures work in silk, weaving alongside—even within—each others'

lines, but they arrange their lines differently, with different purposes and parallels, and their traces say a lot about how they live, their lively entanglements. I, too, feel entangled: as I trace the silk with my eyes, I string together my own alphabetic lines, my written phrases responding to and grappling with the unfolding scene, searching for understanding. And so, all of our creations, our structured lines, resonate with their own kind of meaning, materiality, and authorial intent. Perhaps the caterpillars, the spider, and I are all writing stories in and about this place.

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What does it mean to call non-humans *writers*? What might it mean to *read* their work? As a literary scholar, I've been trained to read Shakespeare, not spider webs. But lately I've been wondering how I—as a reader and a writer—might engage with the mark-making and trace-laying practices of other beings. Might their expressive practices teach me something about my own writing too?

The spider and caterpillar webs in an oak tree near my home offer a material grounding for these provocations. In the pages that follow, I assume these creature's creations are literary expressions, but my intention is not to try to 'fit' these webs into established literary definitions that centre human (and often western human) texts and authors. On the contrary, by tracing threads across incomplete histories, literary theories, and western philosophical traditions, I destabilize definitions of writing—and then refuse to restabilize them. By cultivating uncertainty around literary practices, I hope to create space for alternative understandings of reading and writing to take root so that we might rethink the role that these practices play in our more-than-human relationships. The structure of these unstable reflections are inspired by the webs

themselves. Thoughts emerge and fall away, intersect and cross over each other, creating a weave of ideas—provocations to *think with*—rather than a final destination or answer.

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Reading, writing, and literature have often been theorized in terms of humanness, as practices that separate humans from other creatures. According to Edward Chamberlin, in canonical western scholarship, "it is usually assumed that reading and writing are relatively recent developments" in human history; sometimes they are said to "define" the emergence of human civilization (67).[1] According to this narrative, literacy is indicative of some higher order of "civilized" living, wherein humans enact species-specific expressions by giving life to the species-specific thought patterns.

Rene Descartes, a 17th century French philosopher, is infamous for theorizing this kind of human exceptionalism.[2] Descartes claims that non-humans "could never use… signs as we [humans] do"; here, a particular kind of sign-usage (that is, using signs "as we do") separates humans from all other creatures. [3] Descartes admits that non-human creatures shape patterns in the earth, but he insists they act "only from the disposition of their organs" and do not "think" of about what they are doing.[4] That is, for Descartes, human expressions grow from "thinking," but

1. Edward Chamberlain, "Hunting, Tracking, Reading" in *Literacy, Narrative and Culture*, ed. Jess Brockmeier, David R Olson, and Min Wang (Oxfordshire: Routledge, 2013).

2. Rene Descartes. "Animals Are Machines." In *Animal Rights and Human Obligations*, ed. Tom Regan and Peter Singer (London: Pearson, 1976), 14. We could also trace the human-nature or mind-matter divide back to the ancient Greeks, as does Abram.

3. I am specifically focussing on writing and literature in this essay, but Descartes' human exceptionalism extends far beyond the written word, as he also believes that non-humans cannot speak or think at all.

4. Descartes, 14.

non-human expressions represent thoughtless instincts. But what is thought or thoughtlessness? These nebulous concepts—thinking, language, sign-making—are never satisfactorily explained in his work, even as they are presented as proof of human superiority.

Descartes' theories have reverberated across centuries; some even call him the "father of modern philosophy,"[5] but his statements about human and non-humans' linguistic capacities were likely able to take root because they echoed an already-established philosophical construct—The Great Chain of Being—which used hierarches to map relationships between creatures. According to this theory, "all forms of life on the planet exist in ranked order, from the most to the least important."[6] God sat on top, followed by humans, animals, and plants. Rocks, minerals, and soil lay at the bottom of the chain. Inside these broad categories, further divisions were made: some animals (such as large predators) were thought to be of a "higher" order than others. So too: "the chain of being could be used as a model to conceptualize different human 'types,' or races" that were ranked.[7] White, western peoples (and particularly men) were presumed to be closer to God, while Black, brown, and Indigenous peoples were lesser humans,

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5. Emmy van Deurzen and Raymond Kenward. "Descartes," in *Dictionary of Existential Psychotherapy and Counselling* (Los Angelos: SAGE Publications Ltd, 2011), https://doi.org/10.4135/9781446220771, 52.

6. Luis A. Vivanco, "Great Chain of Being," in *A Dictionary of Cultural Anthropology* (Oxford: Oxford University Press, 2018).

7. Colin Blakemore and Sheila Jennett, "great chain of being," in *The Oxford Companion to the Body* (Oxford: Oxford University Press, 2001.) Blakemore and Jennett. The slippage between past and present verbiage here marks an uncertain timeline. The Great Chain of Being is generally not openly accepted today. Biologists, for example, do not assume that a lion is more important than a tree frog, and biological explanations of race have long been debunked. And yet, as this essay argues, the legacy of the Great Chain of Being lives on, and its hierarchies shape our lives according to our position in the world.

occupying a space between white Europeans and other animals.[8] For example, Black Africans were said to lack "spirit" and "mind"; in other words, the illusive "thinking" that, for Descartes, made human writing superior to non-human scratches, was not ascribed to all humans equally. [9] Racism and speciesism have always been entwined.

So, when Descartes claims that non-humans animals "could never use… signs as we do," his "we" deserves suspicion; who are the sign and language users that he imagines? Whose signs and mark-making practices represent "real" writing? Indeed, while Descartes was writing his philosophies in Europe, mission schools—a precursor to the genocidal enforcement of residential schools—had already been established for Indigenous children across Turtle Island.[10] As settler colonial institutions, these schools tried to forcibly assimilate Indigenous children into European culture—European languages, European literary practices, and European knowledge systems. Children were removed from their lands and communities; residential schools represented, in the words of Salish writer Lee Maracle, "the orchestrated fragmentation of our world."[11] By

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8. Ervin Hazel Arnett Ervin, "The Great Chain of Being," in *The Handbook of African American Literature* (Gainesville: University Press of Florida, 2004).

9. Molefi Kete Asante, "The ideological origins of chattel slavery in the British world," National Museums Liverpool, 21 Aug 2007, https://www.liverpoolmuseums.org.uk/ideological-origins-of-chattel-slavery-british-world. European philosophers "organized the category of Blackness" that separated them from other humans. The consequences of this categorization extend far beyond literacy and language. The Great Chain of Being and dehumanization of Blackness helped justify chattel slavery, colonial violence, and both systematic and individual instances of racism.

10. Eric Hanson, "The Residential School System," Indigenous Foundations. First Nations and Indigenous Studies UBC, 2020, https://indigenousfoundations.arts.ubc.ca/the_residential_school_system.

11. Lee Maracle, *Memory Serves* (Edmonton: NeWest Press, 2010), 386.

preventing children from learning their cultural traditions and languages, these schools aimed to erase Indigenous forms of expression—including Indigenous peoples' own signs and symbols.

Despite a pervasive notion that Indigenous peoples did not write prior to colonial contact, there is ample evidence of various writing practices on Turtle Island that pre-date European influence. The Anishinaabe used birchbark to keep dental records[12] and spiritual histories.[13] Lakota, Kiowa, and Blackfoot kept annual winter counts— "pictographs drawn on tanned bison hides"—that recorded events that were significant to their communities.[14] The Haudenosaunee wove "small tubular shell beads woven into symbolic designs" to form wampum belts, which would be used to form treaties with other peoples.[15]

Of course, the existence of these practices shouldn't be used as evidence of some ill-defined "civilization"; Indigenous cultures do not need to meet any external criteria to be valid. But I think it's worth noting that these traditions likely don't come to mind for most people—including literary scholars—when we discuss reading or writing. Terms like writing, reading, and literacy are politically and culturally positioned, and who gets to be a "writer," human or not, is not so straightforward as it might initially seem.

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12. Louis Erdrich, *Books and Islands In Ojibwe Country: Traveling Through The Land Of My Ancestors* (New York: HarperCollins, 2014), 3.

13. George Copway, *Traditional History and Characteristic Sketches of the Ojibway Nation*. 1850 (Waterloo: Wilfrid Laurier University Press, 2014), 91.

14. Blanca Tovías, "The Right to Possess Memory: Winter Counts of the Blackfoot, 1830 -1937," *Ethnohistory* 61, no. 1 (2014): 99–122. doi:10.1215/00141801-2376096, 99.

15. Richard Hill and Daniel Coleman, "The Two Row Wampum-Covenant Chain Tradition as a Guide for Indigenous-University Research Partnerships." *Cultural Studies, Critical Methodologies* 19, no. 5 (2019): 343. doi.org/10.1177/1532708618809138.

This is not to say that the attempted erasure of Indigenous peoples' cultural practices and technologies is the same as the dismissal of non-human expression. The Great Chain of Being sought to swallow all; everyone has been affected by the assumptions it carried, but not everyone has been—or continues to be—affected in the same way. Different beings have particular social relations and capabilities that shape how they can interact in the world. The writing of a caterpillar and the writing of a women may both be judged to be less valuable than the writing of a white, western man, but this judgement carries different material consequences for each of them, because caterpillar and a woman are two very different beings. They write for their own purposes and within their situations according to their particular needs, possibilities, and vulnerabilities.

So too, the consequences of the Great Chain of Being are always context-specific, and have shifted with cultural and political changes. In Descartes' time, the Great Chain of Being was validated through religion; like many early modern western philosophers, Descartes' ascribed humans' supposed superiority to the will of a creator-God who created all things with an essential nature.[16] That is, in this moment in history, the chain of being relied on "a static view of nature,"[17] wherein all beings were created to be just as they were: trees were trees, caterpillars were caterpillars, spiders were spiders, and all these species had their own unchanging abilities. But then Darwin came along and challenged the presumed static nature of beings. The theory of evolution claimed that all beings were always changing, and had not, in fact, been created with

16. David Abram. *Spell of the Sensuous: Perception and Language in a More-Than-Human World* (New York: Penguin Random House, 1997), 78.

17. Blakemore and Jennett.

stable, separable, and unequal natures. When Darwin placed all animals in a story of evolution, western philosophers' assertion of human superiority via divinity was shaken.[18]

And yet, the Great Chain of Being did not go away; it simply morphed. A story about a static nature with "higher" and "lower" beings became a story of linear progress, and some beings were more or less "evolved" than others.[19] Humans were still superior to other animals, and white men were still superior to other humans, but this superiority was now given a biological source. Language was caught up in this intellectual shuffling: humans' signs, words, and other language practices became "naturalistic evidence for [their] superiority."[20] The ability to use language was not a gift that had been bestowed by an all-powerful God, but an ability that (some) humans had developed themselves through intellectual prowess. According to this logic, non-human species didn't communicate exactly like (some) humans did; thus, they were clearly not as evolved. That not all humans communicate in the same way, and that humans cannot communicate in the precise manner as other species, was generally left unsaid.

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I return to the oak tree the next afternoon. The summer heat flares, but the tree feels docile and content. I duck underneath the branches again, eyes peeled for eight-legged surprises, but the path is clear. The nearest strands of silk are less than a foot above me, but the caterpillars are huddled together deep in the nest for daytime slumber. I see one twitch, and another lazily

18. Abram, 78.

19. Like any widespread theory or text, Darwin's work has been interpreted many different ways, and many scholars see his work as elucidating a vision of non-hierarchical evolution as opposed to a linear vision of progress. But even if Darwin's work does not necessarily or inevitably support hierarchal thinking, it has been used to justify the Great Chain of Being and adapted to explain the unequal treatment of different groups of people.

20. Abram, 78.

moves their head. I try to stay silent as I scan the web's underbelly. I finally spot a spider, sleeping not far from the webworms, sheltered from the sun by the curve of a leaf. And then… more spiders? I'd only seen one at night, but it seems (at least) three spiders live here. So too, three orbital webs come into view. It's easier to trace the fine details of the silk when they sparkle with sun. And although these species' works carry different intentions, they both glitter with a "vitality intrinsic to materiality," what Jane Bennet calls "thing-power": these webs' presence have "the ability to make things happen, to produce effects" (3, 5). They actively shape how other creatures and forces—including myself—make sense of this place. The caterpillars and spiders respond to each other, noticing, navigating, and avoiding each others' webs. I respond to them, moving around their creations and beginning to write my own. For a while, I try to sketch the web, to copy the particular patterns of intersecting threads. But it doesn't work; there is simply too much silk, and every time I move my head, some threads vanish from sight, while others are suddenly illuminated by sunlight. I feel a kind of complexity I can't quite reach. Perhaps I'm projecting—but perhaps not. How would I know for sure? I don't write in silk, and these critters don't speak my language.

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Advances in western biology and evolutionary theory have done little to challenge assumptions of human superiority. In 1970s, American researchers[21] taught chimpanzees American Sign Language; a number of primates at different institutions learned hundreds of signs.[22] When Chickasaw poet Linda Hogan reads through accounts in which researchers grapple

21. Similar experiments took place at several institutions, including the University of Nevada and Columbia University.

22. Hogan, Linda. *Dwellings* (New York: Norton & Company, 2007), 53.

with this cross-species communication, she notes that "many members of the scientific community played down the similarities" across species, and "searched instead for new definitions of language" that would ensure that the expressive practices of non-human animals were kept separate "from our own ways of speaking and thinking."[23] There is a kind of irony to these researchers' shifty definitions. Surely, they designed experiments in the hopes of sharing a language with other species?[24] Yet, when the specialness of human communication fell into question, they sought to re-create a separation.[25] But perhaps it's not surprising: the institutions behind this research were already invested in human superiority, taking for granted that non-human animals are objects of study meant to increase researchers' knowledge. These studies were invested in cross-species communication—but because researchers wanted to learn more about communication itself, and not because they wanted to learn how to be more respectful to other species. Further, when this research began, academic institutions still used chimpanzees in "torturous" forms of animal testing;[26] they were seen as a stepping stone to knowledge, a tool to improve human lives, rather than sovereign beings.

And while academic standards for research ethics have improved since the chimpanzee studies began, certain underlying assumptions haven't. In 2013, after surveying over 67000 papers published in sixteen popular scientific journals, biologists Emanuele Rigato and

23. Hogan, 112. Hogan is making a statement about a trend within published work. Not every individual researcher would have felt this way.

24. Hogan, 58.

25. Hogan, 53.

26. Hogan, 54.

Alessandro Minelli announced that "the great chain of being is still here."[27] While static hierarchies and theories of progressive linear evolution are widely understood to be factually incorrect, Rigato and Minelli found that the "linguistic expressions" commonly found in current scientific literature are "perfectly compatible" with the Great Chain of Being worldview. Descriptions of "less to more evolved" beings and "'higher' and 'lower'" are still used, creating a hierarchy "in which humans are commonly self-designed as "highest."[28] Meanwhile, Ellen W. Gorsevski notes that much of modern science employs "excessively distancing discourse" language that "has been persuasive in uncoupling humans from other animals."[29] Rather than referencing "pleasure, play, or improvisation," animals' actions are described with "calculating, functionalist logic" that precludes human empathy or feeling.[30] By curating their word choices to present non-human behaviour as disinterested or passive and human behaviour as intentional and nuanced, scientific literature can recreate a separation between human and non-human—a separation that enables the hierarchy of species to live on.

Of course, the devaluation of non-human lives is hardly news to anyone who's been paying attention. The climate crisis is unfolding all around us. Current reports of the "mass extinction"—mass death—of plants and animals seems to have no consequence. Although one-

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27. Emanuele Rigato and Alessandro Minelli, "The great chain of being is still here," *Evolution: Education and Outreach* 6, no.1 (2013): 1–6. https://doi.org/10.1186/1936-6434-6-18.

28. Rigato and Minelli.

29. Ellen W. Gorsevski 87

30. Hustack and Myers 76-77).

third of species are at risk,[31] little has been done to prevent such a tragedy or mourn the lives already lost. Instead, as Robert Macfarlane notes, many people "register [the] crisis, if at all, as an ambient hum of guilt, easily faded out."[32] And while such apathy is multi-dimensional and has aptly spawned nuanced conversations around culpability and positionality, it is hard to deny that non-human lives—and deaths—seemingly don't register as valuable in the global North.

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Given this troublesome history, perhaps it's not surprising that some scholars have become suspicious of writing altogether. In his essay "How to be Here," Tim Lilburn worries that writing may be a practice of "bending" the non-human into "human forms," simultaneously "misconstrue[ing]" its subject.[33] When I spell out c-a-t-e-r-p-i-l-l-a-r, I am relying on a preestablished definition and alphabetic conventions to communicate in my understanding; does the word "caterpillar" really do the critter justice? Lilburn is trying to respect the difference between creatures and acknowledge the limitations of descriptive practices, and his concerns are worth bearing in mind; words are not equal to their referents.

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31. David B. Wake, and Vance T. Vredenburg, "Are We in the Midst of the Sixth Mass Extinction? A View from the World of Amphibians," in *In the Light of Evolution: Volume II: Biodiversity and Extinction,* eds. JC Avise, SP Hubbell, and FJ Ayala (Washington DC: National Academies Press, 2008), 27.

32. Robert Macfarlane, Generation Anthropocene: How humans have altered the planet for ever," The Guardian, 1 Apr 2016, www.theguardian.com/books/2016/apr/01/generation-anthropocene-altered-planet-for-ever.

33. Tim Lilburn, "How to Be Here?" in *Living In The World As If It Were Home*, (Toronto: Cormorant Books, 1999), 8.

But here, too, we run into problems, because Lilburn's analysis relies on a sharp dividing line between non-human and human. This analysis assumes that non-humans live in a separate world from the human language; here, the written word is strictly a "human form" that comes from *outside* and is forced onto the natural world. In doing so, the written word "misconstrue[s]" non-humans; when human readers adopt abstract language, Lilburn assumes that they are being taken away from some unnamed material truth about the world. Chamberlin criticizes just this kind of thinking, claiming that Western scholars too often "lament the ways in which we have *moved away* from [a] oneness with the world into the abstraction and alienation that supposedly come with the written word;"[34] in turn, *moving back* into the material world and forming interspecies relationships is too often assumed to mean *backing away* from reading and writing. But what exactly is this "written word" that must be backed away from? What form does it take, and who is assumed to be its author? Are we placing the Anishinaabe birchbark records in the same story as Darwin's *The Origin of Species*? If we collapse the entire history of all literacy into the history of colonial science and literary traditions, we reaffirm the assumption that reading and writing only exist within the context of western society and history. Furthermore, when we assume that reading and writing are somehow separate from the natural world, then we preclude the possibility of seeing writing in the mark-making practices of other creatures.

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When Hogan reads through researchers' experiments with the signing chimpanzees, she's critical of their response to cross-species communication, but she doesn't decry language or literacy altogether, nor does she frame our present ecological crisis as a crisis of reading and

34. Chamberlin, 68, emphasis mine.

writing. Instead, she's concerned with a crisis of relationship: obsessed with re-asserting human superiority, the researchers miss "the real issue, that of how we treat other beings."[35] Indeed, Western science doesn't have a great track record of treating other beings particularly well—many of the primates in such experiments endured trauma.[36] Still, Hogan suggests that these experiments could have marked "a potential act of emergence, of liberation for not only the animals of earth, but for our own selves."[37] Such cross-species communication offers the opportunity to become more deeply connected to other kinds of creatures, to gain an insight into their "rich emotional life" and, simultaneously, to learn our own capacity for empathy.[38] Signing chimpanzees don't threaten Hogan's worldview. On the contrary, they reaffirm what she has been taught as a Chickasaw woman, that humans "are of the animal world," participants in earthly cycles, and living in deep relation with all the earth; the wellbeing of human and non-human is inextricably entwined, and as we watch climate crises unfold around us, "caretaking is the utmost spiritual and physical responsibility of our time."[39]

35. Hogan, 53.

36. Hogan, 54.

37. Hogan, 54.

38. Hogan, 112. Such emotional connections may seem threatening to researchers invested in the hierarchy of species; they even expel one of the female researchers because she "came to care deeply" for the signing chimpanzees. In another study, a senior researcher decided that women "were not suited to the work of science" because of their tendency to comfort distressed animals.

39. Hogan, 112.

As we learn to care for other beings,[40] Hogan emphasizes our need to listen to the rest of creation, to tune into kinds of language that "pass between us and the rest of nature."[41] Hogan doesn't fully explain these languages, but it's clear that humans are language-participants and not language-owners. As participants, it isn't our job to arbitrate the boundaries of "real" language or writing, but it is our responsibility to take a closer look at our own participation. What kinds of language are we sending out into the world, and how are our literary practices impacting other creatures' language-participants? Even the soil becomes literary in Hogan's work. "To walk on this earth," she writes, "is to walk on… the open pages of history and geology."[42] Walking on these earth-pages, attending to the traces inscribed into our ecologies, will help us better understand the relationships that constitute our communities. We might also find ourselves learning more about our own potential to participate in language and, in doing so, broaden our understanding of our own linguistic and literary potential.

Although different Indigenous nations, writers, and thinkers have their own traditions and stories, Hogan is hardly alone in using literary terms to elucidate her relationship to land. In *Books & Islands in Ojibwe Country,* Louise Erdrich a member of the Turtle Mountain Band of Chippewa Indians, traces writing far beyond and outside of colonial contact. In her brief but beautiful travel memoir, she also avoids defining books, literature, or literary practices, but she invokes them repeatedly in relation to non-human creatures and landscapes as she chronicles her

40. "Care" is a very broad term, and caring for other species will look differently for everyone, depending on our lived experiences, geographical location, unique abilities, and access to resources.

41. Hogan 52, 57.

42. Hogan, 79.

journey across the Great Lakes. "I figure books have been written around here ever since someone had the idea of biting or even writing on birchbark with a sharpened stick. Books are nothing all that new."[43] As she notices the Land writing its own stories, she points to writing in her People's history, paying particular attention to the "mazinapikiniganan," or rock paintings, which "are meant to provide teaching and dream guides."[44] But these paintings aren't separate from the natural world; Erdrich stresses the interconnectedness of the mazinapikiniganan with Indigenous communities and ecologies. Indeed, the writing practices of humans and other beings blend together in Erdrich's book. Islands are compared to libraries, and are sometimes even "books in themselves."[45] Erdrich finds the "same feeling" in the scattered rocks, stones, and shells on a beach as in "a used bookstore with… messy shelves bearing handwritten signs and directions."[46] Are rocks and stones and shells written signs and directions? Are they writing, or writings of, the Earth?

Sandra Styres, a Kanyen'kehà:ka scholar working in the same geographical region, writes that "stories intersect and connect with other stories as we walk this earth. The tracks of all our ancestors can be traced… [on] the surface of this land."[47] Here, story emerges as material traces inscribed in and on the land; by framing these traces as story, Styres positions them in an

43. Erdrich, 3.

44. Erdrich, 2, 39.

45. Erdrich, 3, 1.

46. Erdrich, 61.

47. Sandra Styres, "Literacies of Land: Decolonizing Narratives, Storying, and Literature," in *Indigenous and Decolonizing Studies in Education*, eds. Sandra Styres and Linda Tuhiwai Smith (London: Routledge, 2019), 28.

ongoing series of histories that can be encountered and interpreted. The material world and the literary world are one and the same. For Erdrich, Styres, and Hogan, reading and writing are practices of expression that take place within a world that constantly expresses itself. Human and non-human both write into the world everyday; their writing becomes part of the very substance of creation. Such inscriptions are embedded the materiality of the earth; as such, they can be encountered, interpreted, and inscribed upon by other material beings.

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Summer plods along, and my web visits gain their own rhythm. By the time July turns to August, I'm sitting under the oak twice a day, once in the afternoon and once after dark. I write often, but sometimes just sit and watch. I can't tell if the caterpillars or spiders notice me or not; I may write about them, but I don't know if they write about me. But they are writing about something, or in relation to something—in relation to many things, actually. History, to start with. Both spider and webworms write into the world intentionally,[48] working from genetic memory. That is, webworm caterpillars weave to shield themselves and their food, but they don't wait to be attacked before beginning to weave webs of protection. They begin weaving soon after hatching, responding to the possibility of a predator who might come. Similarly, spiders weave webs in anticipation of their prey, "determin[ing] the length of the stitches in its web according to the dimensions" of particular targets.[49] Now, a spider may never see prey, just like a

48. Intention is a sticky subject in relation to writing. Some scholars have argued that the intention to write is a condition of "actual writing," but others claim that writing exists as long as it can be read, regardless of authorial intent (see, for example, Peter Schwenger's *Asemic: The Art of Writing*). Moreover, the word "intention" itself is uncertain: how can we measure the intention (or lack thereof) of another being? Still, I use it here to draw attention to the webs' purposes and transmission across generations.

49. Giorgio Agamben, *The Open Man and Animal,* trans. Kevin Attell (Redwood City: Stanford University Press, 2004), 41. I cite Agamben here because his discussion of spider webs

caterpillar might never see a predator, but their webs still carry the possibility of these encounters. Looking at a web is a bit like reading a cyclical history: here are traces of what happened before (and what may happen again.)

Undoubtedly, these critters learned how to anticipate these encounters from past generations' interactions with their environments. Previous generations of spiders and caterpillars learned how to use silk to enhance their chances for survival, and left this knowledge genetically, to be used and re-used in the future.

By creating silk patterns, these critters participate in traditions that express hopes and fears that are unique to their species; and yet, the patterns remain nonetheless flexible in order to serve their needs. These creatures are working from ancestral knowledge, but ancestral knowledge is not a concrete plan: both the caterpillars and spiders adapt their web-weaving to their present context, accounting for this tree, this season, and the particular creatures who enter and exit their space. Most obviously, because each tree is different (and different each year), each web must also be different. Orb-weaving may generally spin circular patterns and webworms may generally weave thick sheets, but the precise length of each of their threads depends on the distance between branches and the sturdiness of the oak's limbs; the creatures weave a unique web to fit these conditions. A particularly rainy or windy season may also influence the web's development, as the critters will have to re-weave and patch holes torn open by weather conditions. In this tree, the caterpillars and spiders' designs may also be influencing each other—the critters encounter each other's threads and weave around—even within—the other species'

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invited me to think more critically about the futural aspect of webs. However, Agamben's discussion doesn't offer any agency to the spider, and so differs significantly from my focus. Agamben doesn't see the spider as anticipating their prey so much as following set behavioral codes; in his words, the spider and the fly exist in "uncommunicating" worlds but are nonetheless "perfectly in tune."

webs. In other words, while different creatures' webs follow patterns that have proven useful to their species, each iteration of the webs is nevertheless unique.

To me, these webs feel a bit like a literary tradition. These creatures inherit weaving practices, structures, and particular line-arrangements, and yet also make these structures their own. So too, humans inherit grammatical structures, genres, and literary forms that guide much of our creative and critical writing; yet, we also shape and reshape these inheritances to respond to our particular contexts. Our writing practices are useful precisely because we can adapt them to fit different circumstances, to the different beings, creatures, forces, and stories that surround us. In this way, all of our line-weavings—human and otherwise—are practices of expression and knowledge-sharing that may influence—or be influenced by—other forces and creatures. The caterpillars respond to the arrangement of the tree branches and the presence of potentially threatening arachnids, just as I respond to the web-patterns of the caterpillars. If nothing else, these writings exhibit Bennet's "thing power" in various forms; they can be encountered and responded to as materials;[50] still, how our responses look depend on our linguistic capacities and understanding of how ideas are woven into the material world. Nobody, human or otherwise, reads or writes in isolation. Instead, we take a look around us and, using the knowledge that we have been given, begin to make our own marks in the universe.

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When I started thinking about non-human writing, I came across Chamberlin's essay "Hunting, Tracking, and Reading," which offers one explanation for reading animal traces rooted

50. Jane Bennet, "The Force of Things," in *Vibrant Matter* (Durham: Duke University Press, 2013), 3.

in ancient practices of tracking.[51] Drawing on the work of Louis Liebenberg, he distinguishes between two tracking practices: *simple tracking* and *speculative tracking*. Simple tracking comes first, and it occurs when a tracker uses "information from animal signs in order to determine what an animal was doing and where it was going."[52] Simple tracking is not easy, and it requires "the remarkable ability of trackers to recognize—literally to see—animal signs… often barely perceptible" to the unpractised viewer.[53] Trackers must "know undisturbed terrain;"[54] animal signs are inscribed into soil, trees, air, and water, and so considering these signs requires that trackers must be familiar with their environment, the medium through which the tracks are transmitted.

But for Chamberlin, noticing the creatures' tracks isn't the same as reading them. He emphasizes that it is a skill, but one that involves only "the accumulation of facts" and "does not go beyond evidence."[55] Simple tracking tells a tracker that a non-human was present, and the marks themselves may offer some information about the creature: a deer path along a stream may

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51. Chamberlain's analysis provides one possible starting point, but there are others. One of the more well-known frameworks for thinking about reading material traces in the Earth can be traced back to the theological concept of the Book of Nature. While there may be useful ways to re-purpose this concept, I avoid it here for its tendency to assume "a teleological order within creation" and a "uniquely human role of discerning… creaturely order." By reducing all of non-human nature to a single "book" and casting the human as the "reader," this framework can reinforce human exceptionalism. (See Danielle Sands, "The Sexual Politics of Nature Writing and Lepidoptery: 'The siren song of entomology,'" in *Animal Writing: Storytelling, Selfhood and the Limits of Empathy* (Edinburgh: Edinburgh University Press, 2019), 128.)

52. Chamberlain, 77.

53. Chamberlain, 77.

54. Chamberlain, 77.

55. Chamberlain, 77-78.

reveal the size of the animal, or the intricacies of a spider web reveals the approximate size of the prey they're after. But simple tracking doesn't tell the tracker what the creature did after or before, what the creature is doing now, or how the creature fits into the larger rhythms of the ecosystem or the tracker's life. For Chamberlin, simple tracking "explains nothing; nor does it predict anything."[56]

Instead, explanation and prediction emerge during the second phase: speculative tracking. Here, the tracker develops "working hypotheses" alongside observations. This represents "a new understanding of the relationships between sign and cause that coincides with… a new recognition of the gap between what is said (in a written text) and what is meant."[57] The tracks *say* the creature was here; the tracks (might) *mean* that the animal is now someplace to the north, or south, or that the animal will return here again. The tracker will need to use both "experience and imagination" to understand the track's significance in the present moment, and for Chamberlin, it is this work—determining significance—that is *reading*, and it is profoundly creative. In Chamberlin's example, the tracker is a hunter who uses information from the tracks to "make up a story" about the creature's movements, one that ends with the tracker finding, meeting, and hunting the animal.[58] The tracker moves according to the constructed story and adjusts the story as more tracks emerge. Thus, by interpreting the creaturely traces, the tracker becomes a storyteller who then acts, expressing their imagined story through their own bodily movements: "The hunter's imagination shapes reality… it must happen first of all in the mind

56. Chamberlain, 78.

57. Chamberlain, 78.

58. Chamberlain, 81.

before it happens in the world."[59] Here, reading is imaginative narrating; it is a story-telling practice that shapes the tracker's future actions. The tracker then acts on the meaning they have constructed, and so their reading has an immediate material implication that shapes the unfolding relationship between the tracker, the tracks, and the tracks' creator. We could even say that the act of reading becomes an act of writing, as the creature's tracks bring forth the tracker's tracks. But because tracking involves imaginatively forming and then acting out a story, the story remains open to revisions; the tracker will often need to re-adjust their path.

For example, a tracker hoping to meet a creature might notice tracks moving northward. Knowing that a freshwater stream lies in that direction, the tracker follows the path, imagines meeting the creature by cool, running waters. Yet, they remain open to other possibilities; along their journey, they notice signs of the animal backtracking, and their path altered. The tracker re-imagines the animal and the potential meeting they might have. And perhaps the tracker continues to follow the tracks, making subtle adjustments, trying to decide what the tracks mean, but never ends up meeting the animal. Although they did not arrive at the future they wanted, their reading still shaped their material engagement with the world, and next time they hunt, they alter their reading practices in hopes of encountering the creature.

In other words, according to Chamberlain, reading non-human tracks and traces requires understanding that non-human movements need interpretation within a particular field—or, perhaps, within a particular tree—which also includes the reader. Whether we're reading deer tracks or silk lines or English words, meaning emerges through the relationships that constitute the material world, and these relationships are as dynamic and lively as we are. And humans

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59. Chamberlain, 81.

aren't the only ones who practise this kind of reading: a spider or caterpillar's world is also formed of material relationships, and as they respond to their shifting environments, they too interpret patterns, signs, and traces that have been left behind by other beings.

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Every time a webworm writes a new thread it is gesturing towards a potential future. Individual threads say—*the web might grow here next; we could travel in this direction*—they propose how the web might take shape in the coming days. As the worms travel a thread again and again, it becomes thicker, and is woven together with the rest of the web. In this way, every silken strand marks a recent history which, in a very material way, becomes a map for a possible near future.

But not all strands are retraced. I return to the oak every day for weeks, watching the webworm nest encasing more of the oak's greenery. Sometimes, I anticipate where the web will grow, which leaves will be encased next. But there are also times when I'm mistaken. I see one or two strands tautly bridge the gap between the nest and a still-green branch and wait, expecting to see the nest grow over the next days. But it doesn't; the strands vanish. Did they break during a particularly windy night? Did the caterpillars weaving in that direction get eaten by the spiders? Or maybe they simply changed their mind. Webworm-weavings are experimental. The web is not predetermined, but continuously formed through trial and error. Webworm caterpillars know how to weave, and they want to eat leaves in safety, but applying that knowledge to form a nest is no simple manner: many threads are created, but only those deemed to be most useful are kept up and maintained. Unsupported by the web, individual strands soon snap.

To my eyes, the spider webs may initially appear more fixed, but I know that they too might undergo revision. According to science journalist Ed Yong, orb-weaving spiders "can

adjust webs that have already been spun by adding, removing, or tugging on specific threads"; a spider may also abandon one web to spin another.[60] Scientists cannot yet determine why spiders make various kinds of revisions—perhaps the spiders don't want us to know—but I imagine that they are driven by the spider's interpretations of their environment and their hopes for survival.

Much like a caterpillar adopting past knowledge to contend with a particular tree, the ways that humans express themselves and write has everything to do with who they are and what they need. Writing is often a matter for experimentation and revision, of trying out ideas that seem to fit a situation or need, and then abandoning them. Sometimes a particular thread holds: we write the same idea over and over again across days, months years, or a line written by one writer may resonate with others and be re-written many times.

The material stakes of human and insect writings are not the same. We use different materials, live in different relations to the world. And yet, there's also room for comparison and learning. The more I sat with webworms, the more I was invited to think about my writing process and the lines that I send into the world. I'm reminded that my writing is not finished when it finds a perfect form, but rather when I (and any of my collaborators) decide that the arrangement of my sentences suits my needs and fulfills my intentions—or at least, comes close enough. So, too, when I read human-authored texts, I do not arrive at a final meaning or correct answer; rather, I form a tentative understanding from my current understanding or needs. Like a tracker following a set of deer tracks, making constant adjustments to their path, readers and writers are always contending with meaning in motion. *Maybe this is the way to go. Maybe this*

60. Ed Yong, *An Immense World* (New York: Penguin Random House, 2023), 207.

idea—this understanding of reading and writing—will help me engage with the world, will help me grow as a person—or maybe not.

Perhaps, similarly, creating a perfect definition of reading and writing is less important than working with a few good-enough ideas that serve the needs of the world today—a world which badly needs more people to move away from hierarchical thinking and learn to care for other kinds of creatures.

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Chamberlin's work offers a helpful starting point to think through the details of our encounters with non-humans, but the more I ponder his analysis, the more his terms blur. Chamberlin insists that only speculative tracking is reading proper, and he proposes that the shift between these two practices emerges when the tracker begins to imaginatively "explain the visible world by a postulated invisible world."[61] But is there not also something speculative and imaginative about simple tracking, about simply seeing the tracks *as tracks* and attending to the conditions of their presence?

Recognizing patterns is central to track-recognition: I connect a series of tracks together and position them within the unfolding of my environment. I do not simply see one mark and then another; instead, I see these marks in serial form, and I imagine they are intimately related, created by another expressive power in the forest. In doing so, I conjure up another creature with whom I share this space; I imagine another being who has participated in building the world that surrounds me, and thus might be able to tell me something of my world. Even before I imagine

61. Chamberlain, 79.

what the tracks mean—who the creature was, where they were heading—I already imagine the tracks as a pattern that may *potentially hold meaning*.

The work of imaginatively stringing together a pattern of marks is also central to more conventional understandings of reading. Even before unpacking what a text might mean, readers recognize textual marks: as Peter Schwenger notes, written scripts are recognizable *as scripts* because of the repetitions and variations of shapes and forms: "all words are resemblances. It's not that they resemble in the least whatever it is that they signify. They resemble each other: other markings in similar configurations."[62] This is why I can recognize writing even if I am unfamiliar with the language or alphabet. I don't need to decode writing to know that it is writing. Even if I cannot understand the meaning of the words, I sense that they mean something to someone; they mark the expressive world of another.

In this way, I postulate an invisible world even when simply seeing the tracks, because I am not simply seeing marks in the earth. I am imagining a story of what came before, a history that I did not see in which a creature was present and performed a series of actions—presumably, with purpose—that resulted in a particular pattern. When I stand under the oak tree, I can't be absolutely certain that a web was created by a spider just because it holds a radial pattern. I don't know what thought went into this web or precisely how it came into being. Further, sometimes a web has more than one author; disentangling the expressive forces of multiple beings isn't always possible. I have to engage in some guesswork. Of course, with enough practise I can make pretty good guesses connecting traces to their creators, and I can also see how these webs help their creators engage with the world. Still, I'm always hypothesising, using patterns in the earth to imagine a world I cannot see (a world that was) in order to understand what I can see.

62. Chamberlain, 67.

Does this mean that all pattern recognition is reading? Are all material traces writing if we can imagine them within a story of a place, a people, a force? Perhaps *writing* comes into being through this very act of imaginative reading; perhaps it is the relationship between reader and traces that makes writing appear, acknowledging that writers are often their own readers. Although perhaps not the way many conceptualize writing, Chamberlin also suggests "reading comes before writing,"[63] and so asks us to ponder when and how patterns become writing proper.

Still, I am not sure I am ready to put a box around writing. And not all imaginative tracking practices are the same. That is, the two tracking (or reading) practices that Chamberlin describes are not identical, but they aren't distinct in precisely the way that he outlines. In my reading, the distinguishing factor between simple and speculative tracking isn't imagination or speculation: instead, speculative tracking occurs when the tracker intentionally includes themselves in the constructed narrative. When the tracker is practising speculative tracking—what Chamberlain calls "reading"—the tracker is not only imagining an "invisible world," but a world *that implicates themselves*. The tracker begins to explain the tracks in terms of their significance *to the tracker* and the future relationship the tracker hopes to bring into existence. This means that the tracker's hopes for a future relationship are integral for the tracking process; the intentions of the tracker are inseparable from the meaning that they will interpret. In the words of Cherokee scholar Daniel Heath Justice: "relationships are storied, imagined things; they set the scope for our experience."[64] A tracker reads by using story to imagine themself and

63. Chamberlain, 73.

64. Justice, Daniel Heath. *Why Indigenous Literature Matters* (Waterloo: Wilfrid Laurier University Press, 2018), 74.

another creature; this imagination, this storytelling, informs their unfolding relationship, creating a framework through which a tracker can experience and understand another being.

So, although Chamberlin insists that, for hunter-trackers, "the catching and killing of the animal has nothing at all to do with the tracking and reading,"[65] I think that catching and killing has everything to do with the tracking and reading. After all, the catching and killing provide the framework for the tracks' significance. The hunter-tracker creates a narrative according to the track's possible meanings *for the hunt,* using the requirements of a successful hunt to guide their understanding. Now, hunting is not the only possible imagined relationship—a photographer might be tracking an animal in hopes of capturing the perfect shot, a biologist might be on the hunt for some data, or just a resident hoping to visit. In all these cases, the tracker-reader's intentions determine how they read, and that reading shapes what they do next.

As for myself: I came to these webs hoping to learn something about literariness, and my intentions shaped how I interpreted the silk patterns, attending to things like repeating structures across various iterations. I imagined myself as a web-reader and a student of these non-human writers. This imagination became a framework for my engagement with webworm caterpillars and spiders. I started to look for patterns in the webs, paid attention to the relationship between the lines, and thought about the various traditions these weaving practices represent: where did they come from? What purpose do they serve? How might the presence of one web shape the weavings of another? I also become invested in these webs: I wanted them to continue growing, I wanted to see how they would be shaped and re-shaped by caterpillars and spiders, and how they would respond to their changing environments.

65. Chamberlain, 83.

One might say that I am reading into the webs, seeing what I want to see. In her brief manifesto *Uses of Literature*, Rita Felski notes that readers are constantly connecting what they read to their own lives and experiences, but she also identifies a pervasive concern that, by connecting the text to themselves, readers will "appropriate otherness by turning everything into a version of [themselves]" and read simply to affirm their own experience.[66] This apprehension will sound very familiar to scholars in critical animal studies, who are equally concerned with the possibility of humans reading themselves into the bodies and traces of non-humans. In an effort to connect with other kinds of creatures, well-meaning humans can turn other animals into a mirror of themselves. Author Richard Kerridge notes that many scholars are aptly wary of "a preoccupation with ourselves that makes us uninterested in the otherness of other creatures;"[67] when entirely engrossed in the project of finding ways that humans and non-human are alike, we may find ourselves confusing our intentions with the intentions of others.

Yet, imagining myself *in relation* to another being (or in relation to a written text) is not the same thing as imagining myself *as* that other being (or text). Indeed, being in relation suggests some kind of connection, it also presumes heterogeneity; if I relate to you, then I am not you. In Felski's words, the connection that readers may feel with a text need not be "confused with harmony, symmetry, or perfect understanding."[68] Instead, readers "come to see themselves differently by gazing outward rather than inward."[69] Readers' ability to imaginatively include

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66. Rita Felski, *Uses of Literature* (New Jersey: Wiley-Blackwell, 2008), 27.

67. Richard Kerridge, *Cold Blood: Adventures with Reptiles and Amphibians* (New York: Random House, 2014), 63.

68. Felski, 31.

69. Felski, 31, 23.

themselves in the story is not a matter of assuming the other is like me—that a caterpillar or spider writes the same way that I do—but instead of learning more about myself by learning about another. These learnings are always partial and incomplete, open to interrogation and reconsideration; they grow with us.

This work of imaginative inclusion calls to mind Lee Maracle's discussion of Salish storytelling practices: rather than treating stories as mere "educational subjects" to glean abstract information, "we [the Salish]… look for ourselves in the story."[70] Here, interpreting the story is inseparable from interpreting where one fits in the story. Further, the process of interpretation occurs within the Salish people's desire to be "right with creation."[71] The imaginative power of storytelling melds with the Salish people's understanding of what it means to live in relation to the rest of the earth, and they share and interpret stories to understand and fulfill their responsibilities to other creatures. This is an ongoing, dynamic process; as Maracle explains, a story is meant to "work for" people—it implicates people—and a story is continuously "worked with"—it is interpreted and reinterpreted to ensure its meanings continue to align with the people's needs and intentions.[72]

I am not Salish, but I think there's a lot to learn from Maracle's discussion. When I try to read non-human tracks or understand the expression of another creature, I must also acknowledge the intentions that frame my understanding. I must consider how my imagination is

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70. Lee Maracle, 393.

71. Maracle, 393.

72. Maracle, 393. Maracle's discussion of storytelling is based mainly on oral storytelling, though she notes that Indigenous literacy uses many of the same principles, and also suggests that understanding Indigenous ways of engaging with story is essential for scholars attempting to engage with Indigenous-authored texts.

contributing to my relationship to this creature, and how I create meaning by connecting my imagination and intentions with the material expressions of another. At the same time, I must hold my imagination somewhat lightly: if I want the relationship to continue, I must be willing to adapt, to shift, to trace some threads and abandon others.

As I see it, reading non-human writing (and perhaps even human writing) requires balancing moments of connection—how does a particular expression matter for me as I imagine my world—while also recognizing that it does not *only* matter for me; there are other people and creatures who are participants in this mattering. I connect reading to my knowledge and experience, but I do not control the material presentation of the reading. I continuously re-shape my imagination in accordance with the material world around me, making adjustments as needed, much like a tracker shifting directions or a webworm abandoning some threads for another. When I read, I try to honour the original expression, consider my own position, and imagine how the text (or the tracks) shape the future.

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My visits to the webs don't stop when the leaves change, painting the forest with autumn hues. A chill hides in the wind. A season ends; a season begins.

The small critters are gone. I'm not sure about the spiders, but I haven't seen them in weeks. Their webs, made of thin silk, disappear quickly. The caterpillars are likely somewhere near the base of the tree, wrapped in cocoons to wait out the winter. Their nest remains, for now, accumulating debris, dead leaves and stems, bits of dirt and dust. Holes emerge; the silk is still dense, but without the upkeep of the caterpillars, the web begins to decay. It will be gone in a few weeks. Not gone, exactly; it will likely fall from the tree and silk will scatter, eventually folding into the soil.

I flip back to the opening pages of my notebook, eyes tracing lines across a page with scribbled questions about "real" reading, "real" writing. A little voice in my head asks: *Did it work? Were you able to see non-humans as writers, read their works, destabilize the traditions that have so long excluded other kinds of creatures?*

The web shakes in the breeze, catching more debris. I feel as uncertain as the silk remains, barely tethered to the tree. I never did learn, I think, exactly how the spider and webworms relate to each other. I never saw a spider meet a caterpillar, never could parse the precise interactions of their webs. Did I ever successfully read a web; would I even know what a successful reading would look like? And what of this moment: what conclusion emerges amid the web's final chapter? The threads that once seemed so secure now waver uncertainly. Unlike many of the writing technologies that I use, webworm webs are extremely biodegradable: the web is supposed to disappear. Webworms and spiders don't weave their lines in hopes of having their artistic skills immortalized. They write to help them relate to their community members and find their own conditions for survival; they leave the web behind when it no longer serves them.

Did it work, another voice asks. *Did you learn something about reading, about writing? Did you learn something about these creatures, learn something about respecting them, about noticing their presence?*

Yes, I think. *Maybe*.

I close my notebook for the season, but I know I'll be back in the spring.

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Unconcluded: Thoughts on Cocoons and Continuing

As I approach the end of my time in grad school, I find myself, almost by reflex, returning to the books I read when I began my studies: Donna Haraway's S*taying with the Trouble*, Robin Wall Kimmerer's *Braiding Sweetgrass*, Laurie Ricou's *Salal*, and Daniel Coleman's *Yardwork*. These are the books that opened the environmental humanities to me, that provided me with a pathway into graduate research. My return to them is partially fueled by my gratitude; I am hugely appreciative to these writers for the many lessons I've learned over the past few years. But I sense another motivation behind my return—a lingering desire to come full circle. I am pulled to the past, hoping to remember how I arrived at the present and, in the process, find some kind of conclusion or closure.

And so, I return to the beginning. First, to Ricou, who articulated the methodology of Habitat Studies, which I briefly outlined in my introduction. In his book *Salal*, Ricou writes: "To detect the web of connections that forms an ecology… understanding has to start somewhere, and it has to start with a specific."[1] Ricou's "specific" is a small, shrubby green bush in northwest British Columbia; by following this plant, he begins to outline a network of human and non-human beings and cultures. For me, "specific" was the worlds of the fall webworm caterpillars who live in the Great Lakes region. Over the past five years, I have tried to get to know these creatures on their own terms, and I have tried to look at the terms through which they express their ways of knowing. Sometimes this work felt very vast. Fall webworms have wriggled their way into many different knowledge-worlds still in the making, from etymology to entomology, from artistic practice to scientific theory.

1. Laurie Ricou, *Salal: Listening For The Northwest Understory* (Edmonton: NeWest Press, 2007), 180.

A significant part of this work has involved critiquing the ways that prominent settler colonial knowledge systems have undervalued, misrepresented, or mistranslated webworm-knowledge, propping up hierarchal thinking while excusing cross-species violence. But even as I offer critique, I cannot claim to be cleansed of what I am critiquing. I challenge scientific taxonomies even as I regularly evoke them to name other creatures. I am critical of settler knowledge systems while in an academic program in a settler institution. Many of my language habits are inherited from settler colonial writers, teachers, and worlds—worlds I was born into, that I inherited, and that I regularly participate in. "None of us who reside within Turtle Island," writes Sandra Styres, "can erase colonial relations from our narratives—it is inextricably woven into our stories."[2] I can try to grapple with these relations, to recognise and untangle them, to acknowledge the particular complicities and responsibilities that emerge from them, but they cannot be escaped.

Indeed, they continue to materialize and intensify all around. Climate-driven catastrophes rip through cities and landscapes; no one is held responsible. Those with the least tend to suffer the most, but their lives tend to be ignored, lamented—never helped. I have been told that it is now controversial to be anti-genocidal, and some man on the television did a nazi salute. I've not seen it. I've been outside, thinking about caterpillars, about seasons, about endings. Is that proof of my privilege, or am I exactly where I ought to be? Easy answers are rare these days. If I'm honest, it feels like the world is teetering on the edge of war, losing its balance. Meanwhile, I present research that suggests that we stop using the phrase "bee colony" and learn to tolerate caterpillar nests in our gardens. Sometimes this work feels very small. Still, I know that it is not

2. Sandra Styres, "Literacies of Land: Decolonizing Narratives, Storying, and Literature," in *Indigenous and Decolonizing Studies in Education*, eds. Sandra Styres and Linda Tuhiwai Smith (London: Routledge, 2019), 31.

inconsequential; the various violences that squander human and non-human lives are inseparable, and all deserve care. During an era of globe-spanning terrors and persistent hatred, perhaps the decision to care about tiny, hated creatures is its own kind of resistance. But that does not mean it is easy, nor does it mean that I feel anything close to confidence. Perhaps my disquiet also fuels my desire for some kind of closure, my return to the beginning, my search for a conclusion: it would be nice to feel as though I have accomplished something, however small, that might lean toward a better world, or at least the imagination of one.

I find some comfort in returning to Haraway's work. "In the face of unrelenting historically specific surplus suffering" she writes, "I am deeply committed to the more modest possibilities of partial recuperation and getting on together."[3] Haraway's interest—and my own—in "more modest possibilities" doesn't reflect a lack of ambition, but rather an awareness of "complex histories" all around us, full of contradictions, multispecies peoples, and "ways of living and dying" that can neither be swept away nor fully accounted for.[4] Indeed, none of my writings have ever claimed to offer complete solutions to any of the problems that plague our human and more-than-human worlds. Instead, they suggest critical questions and partial ideas that might help us get-on a little better, with a little more respect, a little less violence. Yet, whatever partial recuperations, whatever getting-on I have been able to find, Haraway also reminds me that the work of "getting on together" means *continuing to get on*, continuing to learn, continuing to listen, continuing to think, and continuing to think-with, even amid ecosystem collapse, species extinction, and setter colonial violence. Despite my desire for a closure, there is no conclusion. Research papers get finished, but relationships do not.

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3. Donna Haraway, *Staying with the Trouble* (Durham: Duke University Press, 2016), 10.

4. Haraway, 10.

Still, continuing on does not necessarily mean continuing on in the same way. On the contrary, relationality is dynamic, and it requires shifting, attuning, and reattuning to ever-changing creatures in an ever-changing—and sometimes terrifying—world. And, as it turns out, fall webworms know something about changing, attuning, and reattuning to a changeable world. Just as my learning doesn't end with the conclusion of a particular research article or degree, fall webworm knowledge doesn't end with the web. As I hope my research has elucidated, these critters' knowledge carries a multiplicity of meanings for various peoples and places. Yet, there is one implication of webworm knowledge that I have only obliquely gestured towards, one that is nonetheless extremely important to the webworms themselves. These caterpillars' lives—their hatching, their eating, and their weaving—sets the stage for a radical transformation, because caterpillars don't stay caterpillars forever, and webworm caterpillars are no exception. Some time in the early fall, they'll drop from their webbing to the ground below. They'll burrow amongst the leaves and spin their final creation: a cocoon, where they'll spend the long winter months. The cocoon is a kind of (en)closure; it concludes a certain way of being in the world. But it is also a way of continuing, because once spring rolls over the horizon, the cocoons will burst open, and webworms will re-enter the world—this time, as small white moths.

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I want to end with a few thoughts on cocoons, on transformation, on metamorphosis. My reasons are twofold: first, all of the research that I have presented here suggests the need for transformed relations, whether those relations occur in language, in our emotional connections, or in our traditions and academic practises. I hope that thinking with webworms one more time might offer a fresh perspective on this aspect of my writing and the possibilities for our interconnected lives. That is, thinking with the transformative power of my other creatures may

help us understand our own capacity for change. My second reason is more personal: I feel as though I have been transformed by this work, am still undergoing transformation, and will need to transform further still as I leave a season in my life behind.

But before returning to fall webworms for the final time, I need to make a brief disclaimer: a good deal of research has been done on metamorphosis, both as a biological process and a literary metaphor. One only needs to do a google search to find dozens of books, articles (academic and otherwise), and media objects that explain metamorphosis and consider its implications for various creatures, ecologies, and cultures. I am not an expert in metamorphosis in any sense, and while there are surely pertinent research questions that metamorphosis in and of itself might raise, I am not introducing metamorphosis as an autonomous thread of research. Instead, I turn to metamorphosis through fall webworms, and I use it to reflect upon what I have already said and lived through.

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As caterpillars, fall webworms make rather infrequent appearances in literature, and only in particular genres. But once they disappear into their cocoons, they disappear almost entirely from written records. They don't interfere with gardeners or park visitors anymore, and rather than making large creations at eye level, they're hiding in the soil beneath our feet. Most humans have never even seen a webworm caterpillar cocoon—*I've* never seen a fall webworm cocoon, and I study these creatures! But I've also never looked. I could have dug through the fallen leaves and bits of soil around the trees where I'd found the caterpillars' nests. I'm sure the cocoons would have been there. I remember briefly considering such a search, but I was worried I might inadvertently damage the cocoon if I went rifling through the leaves. How fragile were they? How deep were they buried? If I found one, what would happen if I failed to properly

cover it? I couldn't find answers to any of my questions in the books or articles that I was reading. Webworms' cocoons don't seem to be significant in any literary space. If I'm honest, webworm cocoons didn't feel all that important to me, either. In the past, when fall rolled around and the caterpillars vanished from their nests, I simply trusted that they would be ok, that I'd see a new generation the following spring.

My inattention isn't unusual. While meditating on metamorphosis in his essay "The Truth About Cocoons," Sam Anderson notices that our "emphasis always seems to be on the before and the after, never the during."[5] That caterpillars turn into moths (or butterflies) is widely known, yet the process of being transformed "tends to be skipped," even though it is rather fascinating: while in the cocoon, the caterpillar uses "enzymes to reduce its body to goo."[6] Any features that made the caterpillar recognizable melt into a kind of caterpillar-slush. Inside that slush "are special clusters of cells called 'imaginal discs,'" which are the "seeds of crucial butterfly structures: eyes, wings, genitalia and so on. These [discs] gorge themselves on the protein of the deconstructed caterpillar, growing exponentially, taking form, becoming real"—a real moth, that is.[7] Once metamorphosis is complete, the caterpillars (in this case, fall webworm caterpillars) emerge from their cocoons, and their entire world changes. It's not simply that their body has changed, but their entire way of moving, living, and relating has changed. They don't live in ill-named colonies anymore; they don't elicit disgust anymore; they don't weave silken patterns anymore. Once confined to a single tree, now they now open their wings, catch the

5. Sam Anderson, "The Truth about Cocoons," *New York Times Magazine*, 21 May 2020, www.nytimes.com/interactive/2020/05/21/magazine/covid-quarantine-self.html.

6. Anderson.

7. Anderson.

breeze, and flit through the forest freely. Their priorities change too. As caterpillars, fall webworms need to focus on eating and growing, but as moths, they need to look for mates and lay eggs.

And yet—they're not entirely different. They take their parts of their past with them. Researchers at Georgetown University found evidence suggesting that, in spite of months spent as goo, moths retain memories from their caterpillar days.[8] The precise scope and influence of these memories remains a mystery, but it's possible that they might help the moths decide where to lay their eggs.[9] I couldn't help but notice that, at least in my observations, webworm nests often reappear in the same tree year after year after year, even though most tree species would make adequate hosts. Maybe fall webworms feel the urge to go back to their beginnings, too.

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Given the radical nature of the transformation that ensues during metamorphosis, it's not surprising that caterpillars, moths, and butterflies are often used as symbols for transformation and renewal, especially during moments when transformation feels urgent. Cocoons offer us a vision of collapse, of breaking down forms and frameworks until there is nothing left but "imaginal discs," a plan for a future-creation still in the making. And then this imaginative plan uses the raw materials available to grow something—or someone—entirely unrecognizable. What emerges into the world is new life, new relations, new priorities. What remains is memory: memory of roots, of origins, of lessons learned.

8. Douglas Blackiston, Elena Casey, and Martha Weiss, "Retention of Memory through Metamorphosis: Can a Moth Remember What It Learned As a Caterpillar?" *PLoS ONE* 3, no. 3 (2008), doi.org/10.1371/journal.pone.0001736.

9. Blackiston et al.

Is this not an image of a utopian dream, a revolution, that so many have been longing for? Can we imagine the collapse of the stratifying structures that pervade western societies? Can we imagine the emergence of different kinds of communities, different practices for human and more-than-human relating, practices that are not so quick to value one life over another? Is this what will be required for "getting on together?" Perhaps cocoons are calling us (diversely, in different ways) into a season of being slushy, of feeling formless, so that we might build something new. Perhaps they are calling us to learn how to tolerate the breakdown of previously held assumptions, worldviews, and language habits—indeed, I have already begun pointing to, suggesting, and dwelling in such breakdowns in my research. And while breakdown is often uncomfortable, tolerating discomfort and opening ourselves up to new ways of thinking and writing are themes I regularly return to, both academically and personally, and I suspect it is necessary to bring about any transformation, whether that transformation occurs across our societies or in our individual lives.

Still, we don't really know how the caterpillar experiences metamorphosis. I know the caterpillar's lifecycle, have seen numerous springs come and go, but each caterpillar only undergoes metamorphosis once. They carry the embodied knowledge of what to do next, but that doesn't mean the process is easy. Is it scary? Do they worry if it'll work, if they'll survive? Are they overwhelmed with uncertainty? Or maybe it feels like a nap; after a long season of spinning and eating, they have a few months to be still, to let their body dissolve. And then, once they're re-formed, how do they feel when they first open their wings? Is it terrifying to try to fly for the first time, or does it feel as if they've always known how? Maybe multiple feelings and experiences co-exist together. Transformation, with its beginnings and endings and continuities, isn't always a straightforward matter.

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I know something about transformation.

When I started grad school, nearly all my relationships—with my body, with other people, with time—were rigidly structured by a labyrinth of schedules and rules. There were rules for when I could go home, when I could sleep. Rules for what and when I could eat. Rules for who I could talk to. My rules, I thought, allowed me to function, at least some of the time. I mentioned in my introduction that I was profoundly unwell when I started grad school and, at the risk of repetition, I will reiterate the point here. You see, I'd married young and not for love—I'd been extremely sick and needed housing, some kind of security. It wasn't the right decision. Domesticity can be dangerous in ways that are difficult to talk about; marital rape is a "vast" but "under-researched… calamity."[10] Meanwhile, my illness progressed; my small intestine was, apparently, having panic attacks, slamming up against my other organs, causing internal bruising. "We can see what's happening," a doctor told me. "We just don't know why." Trauma does strange things to the body. And so I clung to rules, and as months became years, my rules became second nature; they were the way the world worked.

And then I changed the world—or my world, at least. I came forward as a sexual abuse survivor. The following months exist only as a haze now; I remember quiet rooms, empty days. I remember quiet anger, too. There were divorce lawyers, doctors, therapists, support groups. And then my chronic pain—my body's chronic panic—started to fade, and seven years of illness simply melted off my bones.

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10. Elizabeth Sheehy, Review of *The Right to Say No: Marital Rape and Law Reform in Canada, Ghana, Kenya and Malawi* ed. by Melanie Randall, Jennifer Koshan, and Patricia Nyaundi, *Canadian Journal of Women and the Law* 32, no. 1 (2020): 231-236, https://muse.jhu.edu/article/752927.

This is heavy, still. Truthfully, it is a wonderfully heavy, impossibly difficult thing to be given your body back after years of illness and abuse. The entire world shifted; my structures and schedules were suddenly obsolete. It didn't matter when I ate or slept. I could just go home, not think about who would be there, what that might mean. And while these were liberating realizations, they were also terrifying. I felt like I didn't know how to do anything anymore. How does a person plan a day if not around chronic pain? How do you buy groceries when you're allowed to eat anything in the store? How do you talk to people when you are not trying to hide from them?

I had a life to rebuild, and by now, I knew what a life was: a series of relationships with places, people, things, forces, and ideas. And if I had to rebuild my relationships, and I knew I would rebuild them first with the ground under my feet, with the body that had suddenly healed itself.

I spent a lot of time in the forest, hiking through trails without shoes because I wanted to feel my feet. I spent nights sitting with caterpillar nests. I climbed a lot of mulberry trees, sensing my skin materialize under the scrap of bark—sensing the materiality of a body that belonged to me, a body held up by the ground and the roots and the strength of the earth. "Even a wounded world is feeding us," writes Potawatomi botanist Robin Wall Kimmerer. "Even a wounded world holds us, giving us moments of wonder and joy."[11] Kimmerer responds to the earth's generosity by giving joy back, not because she's ignoring current events or has her "head stuck in the sand," but because she wants to "return the gift" that was given to her.[12]

11. Robin Wall Kimmerer, *Braiding Sweetgrass* (Minneapolis, MN: Milkweed Editions, 2013), 327.

12. Kimmerer, 327.

How do I return the gift—the life—that was given to me? Can I really claim that my research and writing about other creatures, no matter how well-intended it has been, is enough? I really don't know. If I'm honest, I often feel as if I'm still at the beginning, still reading Ricou and Haraway and Kimmerer for the first time again, still trying to "start somewhere."[13]

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Caterpillar metamorphosis is a remarkable process, and there's a lot to learn from these creatures. But turning creatures into symbols always risks over-simplifying their ways of living. That is, symbols and metaphors invite us to notice and relate to some aspects of a creature's existence, but they can also "can keep us from focusing on other aspects… that are inconsistent with that metaphor."[14] For example, a caterpillar is able to dissolve and reform because they are a unified being; must our societies become of one mind in order to undergo transformation? What might that mean? Further, caterpillars change themselves and their relations, but their forest environment does not undergo such a drastic reconfiguration; the ecosystem's systems for distributing water, energy, and nutrient remain the same. It is possible that cocoon metaphors fit personal transformations more than systemic ones. But even here I find myself wavering: the metaphor of transformation can easily suggest a progressive, linear relationship that doesn't accurately capture the cyclical nature of caterpillar and moth lifeways. That is, I have no intention of returning to the life I left behind, nor do I want to offer this life to anyone else. Yet,

13. Ricou, 180.

14. George Lakoff and Mark Johnson. *Metaphors We Live By* (Chicago: University of Chicago Press, 2003,) 10.

moths lay eggs to enable another generation of caterpillars. Just as caterpillar-life enables moth life, so too moths create the conditions for future caterpillars.

In other words, metaphors about metamorphosis can create a binary that returns us to the assumptions about natural beauty that I've previously critiqued. Butterflies and moths are some of the few insects who are generally exempt from the disgust reactions, while caterpillars—and webworm caterpillars in particular—are often reviled. When seeing a moth as a transformed caterpillar, as a model for progressive or positive change, we risk associating the caterpillar with the thing that we don't much like, the thing that needs to change. We insinuate that there is something wrong with the caterpillar; they represent ugly beginnings, while the moth (or butterfly) is portrayed as better, more desirable.

But, as Andersen writers, "change does not mean progress… metamorphosis does not mean improvement." I find myself returning to the same lessons again and again: move away from hierarchal thinking. Learn from creatures without ranking them. And I think we *can* learn from cocoons without devaluing the caterpillars. Caterpillar metamorphosis doesn't always fit the symbolic meanings that we invent, it is nevertheless part of the ongoing material transformation of the material world, and we can reflect on the process of transformation and dynamic relations without assuming that change is progressive. I may learn something about creation and re-creation from another creature while also acknowledging that my (re)creation occurs in a different context and has different ends. Indeed, the work of "start[ing] somewhere"[15] and "getting on together"[16] is less about finding perfect alignment than moments of congruence and connection. And have I not already written about balancing connection and difference,

15. Ricou, 180.

16. Haraway, 10.

acknowledging positionality while engaging with others? Cocoons feel like yet another call to return, a reminder to remember what I already know, to practise the practices that I've already learned.

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When fall webworm caterpillars feed on summer foliage, they're consuming nutrients and energy that they need to grow their caterpillar-bodies. As they get bigger, they're able to move around tree branches more quickly, reaching more leaves to entangle in their collaborative webby creation. Their caterpillar-bodies aren't bad; they're exactly what the caterpillars need at that moment. And so the caterpillars eat. They grow. They weave. They grow and eat some more. But once the season begins to shift, the body that has suited them since their hatching doesn't suit them any longer. They need something different. They spin a cocoon. And then everything changes.

Nobody but the caterpillars themselves really know what if feels like to come out of a cocoon, but here is something we do know: a cocoon is an enclosed vessel. No solid material gets added once the caterpillar finishes spinning it: the caterpillar creates a moth entirely from their own body. In other words, when the moment of transformation arrives, they don't look outward for something new in the world. They don't hope that technology or god will come and save them. Instead, they turn inward, toward what they already have, to what they already hold with themselves. I think caterpillar bodies hold an incredible kind of self-awareness: they know the materials they hold inside themselves, and they know how to re-purpose—to re-create—them. And in the process, they re-create themselves and all their relations.

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Caterpillars' re-creation reminds me a bit of my first encounter with Daniel Coleman's book *Yardwork.* I'd been assigned the text for a graduate seminar in the environmental humanities and, as a fresh master's student with no confidence, no sense of her skin, and no scientific training whatsoever, I was feeling grossly underqualified to even be in the classroom. In the context of ecologies, it can be difficult to start somewhere—even somewhere small and specific—when you feel like you've got nothing to work with, no way of engaging or relating to other creatures. And while, at the time, I attributed my lack of imagination to a lack of education, studying the sciences may not have actually helped: when Kimmerer surveys her third-year botany students, she laments that they "could not even imagine what beneficial relations between their species and others might look like."[17] The relationship between western science and hierarchal thinking has been a repeated theme throughout my research; knowing facts about other creatures does not necessarily mean we will treat them respectfully.

But *Yardwork* isn't a biology textbook filled with facts, and Coleman isn't a biologist. Trained as a literary scholar, he gets curious: "I began to wonder… if I could transfer the skills I had developed in my bookish education toward reading the relationships that constitute a place."[18] The remainder of the book focusses on the more-than-human relationships that unfold in his backyard: dirt, water, plants, and animals all play a part in his study. It's also a study that exemplifies Ricou's call to "start somewhere" and "start with a specific."[19] But as much as Coleman's "somewhere" is his yard, it's also himself. In other words, becoming better

17. Kimmerer, 6.

18. Daniel Coleman, *Yardwork*: *A Biography of an Urban Place* (Hamilton: Wolsak & Wynn, 2017), 10.

19. Ricou, 180.

acquainted with a particular place was not just a process of looking outward, but also looking inward, taking stock of what he already knows and "transfer[ring] the skills" that he'd already developed (10).

Coleman doesn't suggest that every aspect of his literary training will easily translate into place and relationship readings; as we have already seen, reading, writing, and literature are troublesome terms, and Coleman also observes the English language's complicity in the erasure of Indigenous peoples' languages and land-knowledge.[20] And yet, he's likely inclined to ask questions about language because he's a literary scholar. That is, his particular non-scientific skillset allows him to make insights that a biologist might not; his work is generative precisely because he starts from himself. *Yardwork* was a model that I needed as a fresh master's student because it gave me permission to write, as I have done throughout this research, as myself, even as it also asked me to become more attentive to the creatures around me.

And while reconfiguring a skillset may not seem as radical as the caterpillars' bodily reconfiguration, both processes involve transforming relations by repurposing, re-imagining, and re-working what's already here, and doing so with the aim of transforming how we relate to the surrounding world. This work of re-imagining and re-purposing might be described as work of "getting on together," and this work is for everyone—biologist or book scholar or otherwise. Of course, this work also looks different for everyone too, because we're in different places, carrying different knowledges, skills, and inheritances. These differences may at times cause conflict, and we need to be careful that we don't claim knowledge or inheritances that don't belong to us. I've written here about language, emotion, and literariness because these topics reflect my studies and interests, but it would be wrong for me to claim any sort of scientific

20. Coleman, 57.

expertise, because I don't have that training. I've also written about them from the perspective of a white settler living in a particular region, and I can't claim to be Indigenous or to know much about ecologies that I've never visited.

But the research I have shared also includes lessons that I have learned from people who are very different than myself. While we need to account for our various positions, our differences can also become strengths because, unlike the caterpillars who carry all the knowledge they need into their cocoons, us humans—as individuals—don't have everything we need to transform our relations or, in Kimmerer's words, to "return the gift[s]" that the earth has given us.[21] That's why we need to start somewhere and learn to get along: we need each other. As the world seems overwhelmed by suffering and destruction, Kimmerer tells us that "it is relationship that will endure and relationship that will sustain" our shared ecologies.[22] When we are able to listen to each other, even through moments of discomfort, collapse, or confusions, then we—as a diverse, human and more-than human collective—do have everything we need to "get on together"—and, just maybe, we'll find transformation along the way (Haraway 10).

I find a glimpse of this kind of transformation in Kimmerer's *Braiding Sweetgrass*, a book filled with longing for a renewed earth. Kimmerer isn't ignorant; she sees a "shocking nightmare tableaux of environmental tragedies" and tells stories of lands ruined, muted.[23] But she's also a Potawatomi woman, and she's seen the ceremonies of gift-giving that have long been practised by her people. She knows that nightmare and tragedy aren't the only options, that

21. Kimmerer, 327.

22. Kimmerer, 383.

23. Kimmerer, 327.

reciprocal and generous relations between peoples, lands, and more-than-human communities are not only possible—they are already present in the generosity of other species and the traditional knowledge of Indigenous peoples.[24] And so she imagines a world free from capitalist greed and the entitlement of settler colonialism, a world where western cultures don't get to set the bar for truth, and instead "a polyculture of complementary knowledges" are respected.[25] She imagines a world where "other species [are seen as] a sovereign people," where humans recognize the "dazzling gifts" of the earth and respond by giving back their own "gifts of mind, hands, heart, voice, and vision" to the land and her many inhabitants.[26]

Kimmerer's vision is beautiful; it overflows with generosity, joy, and possibility. I think her words are worth holding onto. And yet, if I'm honest, I often have a hard time entertaining hope for the world, especially these days. I believe there is transformative power in the earth and each of us—how could I not?—but it's hard to look around and imagine how we get from here to there, from a mess of destruction and oppression to respect, care, and generosity.

But then, I've never been to a gift-giving ceremony, and I've been wrong about the world before. And perhaps more importantly: I don't have to fully understand Kimmerer's vision to learn from her words. I don't have to believe in a transformed earth to try and be more respectful, more attentive, and more gracious to other creatures. I know that I've never been very good at imagining endings or conclusions—for good or for ill. I leave grad school behind with a quiet anxiety and no sense of closure. But perhaps that's okay, because I know that I'll keep continuing

24. Kimmerer, 179.

25. Kimmerer, 139.

26. Kimmerer, 58, 383-384.

on, getting on. I'll keep finding creatures to learn from, gifts to give back. That's not so much a conclusion as a promise, a commitment. Or maybe it's just another place to start again.

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Epilogue

I wake up to morning sunlight filtered through an old window and the song of a Carolina wren. And there's a kind of scratching sound, a persistent scrape somewhere in the ceiling; there are squirrels in the walls, the roof. There are mice in the downstairs cupboards too, and a family of rabbits in the shed. We all live here together, in a little white house nestled at the bottom of a hill, surrounded by trees.

I think about this a lot. About the sunlight, the trees. About waking up.

Beside me, Piyush shifts, reaches back, and knocks on the wall. He's asking the squirrels to be quiet, and they are, for about a minute, and then the scraping continues. So he rolls over, kisses my forehead once, twice, and pulls on a sweater before heading downstairs to shower.

I think about him a lot too.

He bought this house about a year ago, against all advice: according to the banks and mortgage agents, it was basically condemned, completely unlivable, and nothing more than a collapsing shack sitting on nearly an acre of garbage. It's not collapsing anymore. There are steel beams in the basement, new drywall in the living room, and most of the scrap metal and piles of abandoned plastic have been hauled away. The yard is still brown, but if you look closely enough, you can see clusters of wildflowers beginning to stir after a long, cold winter. It feels like this house—this place—is beginning to wake up too.

And I think about this a lot: about waking up in this house, with this house. And about waking up to sunlight and squirrels and forehead kisses and the promise of spring.

Today, though, the morning air is still fresh, almost frigid, so I don't bother changing out of my flannel pajamas before I bid farewell to the squirrels and head down the stairs, stepping over containers of paint on my way to the kitchen. I turn on the kettle, put some oatmeal in the

microwave, and hear the shower turn on, a little later than normal. Pi is staying home from the office today. He has a meeting with a city employee; he wants to build a community garden in the yard. I think it's a good idea. The ground has been neglected for too long. It's time for things to start growing again.

He also wants to come to my PhD defence. But I've been deferring the question, as if to defer the ending. Not a logical impulse, I know. I linger by the front window, see birds in the distance. The microwave continues to hum—not unlike the steady buzz of my unanswered thoughts: *What happens when the ending ends? What does a person do after ending*?

Truthfully, I can get so obsessed with my own story, with reaching back and trying to piece together the narrative.

> *Let me tell you about those years when I ran away and did not come back, when I told the truth and did not recant, when I lost an entire family, an entire world, and then realized I hadn't lost anything at all. Let me tell you what it means to be sick for years, and then to get better.*

But the story is a tangle of threads that cross over, under, and around each other; if you didn't see it unfold, it's impossible to draw lines of causation or chronology. Even to me, it exists only with a kind of blunt thereness, as if it were a material thing that I might point to—*there, that happened.* But it's not happening anymore.

> *Let me tell you what it feels like to survive, to pull yourself back together, and then to fall in love and watch yourself come undone all over again—in exactly the right way.*

It's not a new story, falling in love—just new to me. An unexpected joy, the generosity of the world, I suppose. And I think about it a lot.

The shower turns off. I pull my oatmeal out of the microwave, stir in some strawberries and honey, and pour two mugs of coffee. And it occurs to me that *after ending* a person does the only thing they can do: they keep waking up.

Still, I think that sometimes new beginnings happen to us, and sometimes we have to let them happen, have to let endings end, because it's time for things to start growing again. And when I look around, I know that a new beginning had already begun; it's already routine, in fact. And it is *good*. Good like a garden, filled with soil and insects and blossoms and smells. Good like springtime, which returns every year with warmth and greenery. Good like the wren outside, who will probably sing for most of the morning, as she always does. She seems like such a happy bird; maybe that's why she keeps coming back. Maybe she's happy here. And maybe it's beginning to catch, because, for all my forlorn musing and cycles of endless thinking, I'm happy here too. An unexpected joy. The generosity of the world.

Pi steps into the kitchen. I hand him his coffee and sit down for breakfast. He smiles at me. I smile back. Happy endings are happy beginnings, I suppose. And happy beginnings are happy endings, too.