Introduction

In 1956, Lloyd Stouffer, the editor of the US magazine *Modern Packaging*, addressed attendees at the Society of the Plastics Industry meeting in New York City: "The future of plastics is in the trash can. . . . It [is] time for the plastics industry to stop thinking about 'reuse' packages and concentrate on single use. For the package that is used once and thrown away, like a tin can or a paper carton, represents not a one-shot market for a few thousand units, but an everyday recurring market measured by the billions of units."[1] Stouffer was speaking at a time when reuse, making do, and thrift were key practices reinforced by two US wars. Consumer markets were saturating. Disposability was one tactic within a suite of efforts to move goods *through*, rather than merely *into*, consumer households.[2] Today, packaging is the single largest category of plastic production, ac-

1 Hello, Reader! Thank you for being here. These footnotes are a place of nuance and politics, where the protocols of gratitude and recognition play out (sometimes also called citation), where warnings and care work are carried out (including calling certain readers aside for a chat or a joke), and where I contextualize, expand, and emplace work. The footnotes support the text above, representing the shoulders on which I stand and the relations I want to build. They are part of doing good relations within a text, through a text. Since a main goal of *Pollution Is Colonialism* is to show how methodology is a way of being in the world and that ways of being are tied up in obligation, these footnotes are one way to enact that argument. Thank you to Duke University Press for these footnotes.

For this first footnote of the introduction, we have a simple citation: Stouffer, "Plastics Packaging," 1–3. Don't worry. They'll get better.

2 Packard, *Waste Makers*; Strasser, *Waste and Want*; M. Liboiron, "Modern Waste as Strategy."

counting for nearly 40 percent of plastic production in Europe[3] and 33 percent in Canada.[4] The next largest categories are building and construction, at just over 20 percent, and automotive at 8 percent.[5] Stouffer's desire looks like prophecy. (Spoiler: It isn't. It's colonialism, but more on that in a moment.)

Before Stouffer's call for disposability and before German and US military powers invested significant finances and research infrastructure into perfecting plastics as a wartime material in the 1940s, plastic was described as an environmental good.[6] Mimicking first ivory and then other animal-based materials such as shellac and tortoiseshell, plastic was an artisan substance that showcased technological ingenuity and skill while providing "the elephant, the tortoise, and the coral insect a respite in their native haunts; it will no longer be necessary to ransack the earth in pursuit of substances which are constantly growing scarcer."[7] The idea of disposability and mass production for plastics is relatively new, developing half a century after plastics were invented. Most plastic production graphs start their timelines after 1950, ignoring the nineteenth- and early

3 PlasticsEurope, "Plastics," 12. These numbers include thermoplastics and polyurethanes as well as thermosets, adhesives, coatings, and sealants, but they do not include PET, PA, PP, and polyacryl-fibers. Note that PET and PP are some of the most common plastics found in marine environments.

4 Deloitte and Cheminfo Services, "Economic Study of the Canadian Plastic Industry, Markets, and Waste," 6.

5 PlasticsEurope, "Plastics," 12.

6 While historian Jeffrey Meikle (unmarked, see below) provides much archival evidence on how plastics were written about as a replacement for animal products, it is not clear whether there were "actual" material shortages or not, nor is it clear whether plastics played a role in alleviating that shortage (or not). Regardless, this idea was still core to the early reputation of plastics. Meikle, *American Plastic*. For an alternative, see Friedel, *Pioneer Plastic*, 60–64. Thank you, Rebecca Altman (settler), for not only sharing this insight but also consistently prioritizing the work of others in such a way that you reach out as a co-thinker when people (like me) reproduce an academic truism that needs some empirical work. Thank you for your collegiality, for the way you celebrate other people's work with genuine enthusiasm and care, and for your careful chemical storytelling. Folks, see Altman, "Time-Bombing the Future"; Altman, "American Petro-Topia"; and Altman, "Letter to America."

Pioneer and *plastic* appear together quite a bit in both historical and present-day texts. While I will talk about plastic production's assumption of terra nullius, I won't dwell on its relationships to pioneering frontierism, except to say that the use of *pioneer* to mean innovation simultaneously normalizes frontierism and the forms of erasure, dispossession, and death frontierism requires to make its terra nullius.

7 Meikle, *American Plastic*, 12.

twentieth-century histories of plastics since these materials did not exist as the mass-produced substances we know today.[8] Plastics have been otherwise.

In 1960, only four years after Stouffer's address, a British ornithology journal published an account of the "confounding" discovery of a rubber band in a puffin's stomach.[9] It would be among the first of hundreds of published reports of wildlife ingesting plastics, including the ones I publish as an environmental scientist. How did plastics become such a ubiquitous pollutant? There are questions that should precede that question: What do you mean by pollutant? How did pollutants come to make sense in the first place? It turns out that the concept of environmental pollution as we understand it today is also new.

Only twenty years before Stouffer launched the future of plastics into the trash can, the now-dominant and even standard understanding of modern environmental pollution was articulated on the Ohio River. Two engineers in the brand-new field of sanitation engineering named Earle B. Phelps and H. W. Streeter (both unmarked)[10] created a scientific and mathematical model of the

8 See, e.g., PlasticsEurope, "Plastics," 12.

9 Bennett, "Rubber Bands in a Puffin's Stomach," 222.

10 It is common to introduce Indigenous authors with their nation/affiliation, while settler and white scholars almost always remain unmarked, like "Lloyd Stouffer." This unmarking is one act among many that re-centres settlers and whiteness as an unexceptional norm, while deviations have to be marked and named. Simone de Beauvoir (French) called this positionality both "positive and the neutral, as is indicated by the common use of *man* to designate human beings in general." Not cool. This led me to a methodological dilemma. Do I mark everyone? No one? I thought about just leaving it, because this is difficult and even uncomfortable to figure out, but since this is a methods text I figured I should shit or get off the pot. Feminist standpoint theory and even truth and reconciliation processes maintain that social location and the different collectives we are part of matter to relations, obligations, ethics, and knowledge. Settlers have a different place in reconciliation than Indigenous people, than Black people who were stolen from their Land. As la paperson (diasporic settler of colour) writes, "'Settler' is not an identity; it is the idealized juridical space of exceptional rights granted to normative settler citizens and the idealized exceptionalism by which the settler state exerts its sovereignty. The 'settler' is a site of exception from which whiteness emerges. . . . [T]he anthropocentric normal is written in its image." This assumed positive and neutral "normal" right is enacted in the lack of introduction of settlers as settlers, as if settler presence on Land, especially Indigenous Land, is the stable and unremarkable norm. What allows settlers to consistently and unthinkingly not introduce their relations to Land and colonial systems is settlerism. See paperson, *A Third University Is Possible*, 10; and Beauvoir, *Second Sex*.

In light of this complex terrain, my imperfect methodological decision has been to identify all authors the way they identify themselves (thank you to everyone who does this!) the first time they appear in a chapter. If an author does not introduce themselves

conditions and rates under which water (or at least that bit of the Ohio River) could purify itself of organic pollutants.[11] After running tests that accounted for different temperatures, velocities of water, concentrations of pollutants, and other variables, they wrote that self-purification is a "measurable phenomenon governed by definite laws and proceeding according to certain fundamental physical and biochemical reactions. Because of the fundamental character of these reactions and laws, it is fairly evident that the principles underlying the phenomenon [of self-purification] as a whole are applicable to virtually all polluted streams."[12]

The Streeter-Phelps equation, as it came to be known, not only became a hallmark of water pollution science and regulation but also contained within it their theory of pollution: that a moment existed when water could not purify itself and that moment could be measured, predicted, and properly called pollution. Self-purification became known as *assimilative capacity*,[13] a term of art

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or their land relations, I mark them as "unmarked." I do this rather than marking settlers as settlers because of the advice of Kim TallBear (Sisseton-Wahpeton Oyate), who encourages people to look at structures of the settler state rather than focusing on naming individual settlers, which reenacts the logics of eugenicist and racist impulses to properly and finally categorize people properly. TallBear, Callison, and Harp. "Ep. 198."

I take up this method so we, as users of texts, can understand where authors are speaking from, what ground they stand on, whom their obligations are to, what forms of sovereignty are being leveraged, what structures of privilege the settler state affords, and how we are related so that our obligations to one another as speaker and listener, writer and audience, can be *specific enough to enact obligations to one another*, a key goal of this text. How has colonialism affected us differently? Introducing yourself is part of ethics and obligation, not punishment. Following Marisa Duarte's (Yaqui) example in *Network Sovereignty*, I simply introduce people in this way by using parentheses after the first time their name is mentioned. Duarte, *Network Sovereignty*.

11 Organic pollutants can also be industrial pollutants. Organic in this case does not mean naturally occurring—even arsenic, radon, and methylmercury, while "naturally occurring" compounds, do not occur in the tonnages and associated scales of toxicity without industrial infrastructure.

12 Streeter and Phelps, *Study of the Pollution and Natural Purification of the Ohio River*, 59.

13 Cognate terms that describe thresholds of harm used in different countries and contexts include *carrying capacity*, *critical load*, *allowable threshold*, and *maximum permissible dose*. Versions of the term in specific scientific disciplines include *reference dose* (RfD), *no observable adverse effect level* (NOAEL), *lowest observable adverse effect level* (LOAEL), *lethal dose 50 percent* (LD50), *median effective concentration* (EC50), *maximum acceptable concentration* (MAC), and *derived minimal effect level* (DMEL) (which is a truly tricky measure for a level of exposure for which the risk levels of a nonthreshold carcinogen become

in both environmental science and policy making that refers to "the amount of waste material that may be discharged into a receiving water without causing deleterious ecological effects."[14] State-based environmental regulations in most of the world since the 1930s are premised on the logic of assimilative capacity, in which a body—water, human, or otherwise—can handle a certain amount of contaminant before scientifically detectable harm occurs. I call this the threshold theory of pollution.

Plastics do not assimilate in the way that Streeter and Phelps's organic pollution assimilated in the Ohio River. As I pull little pieces of burned plastic out of a dovekie[15] gizzard in my marine science lab, the Civic Laboratory for Environmental Action Research (CLEAR), the threshold theory of pollution and the future of plastics as waste look like bad relations. I don't mean the individualized bad relations of littering (which does not produce much waste compared to other flows of plastic into the ocean, especially here in Newfoundland and Labrador, a land of fishing gear and untreated sewage) or the bad relations of capitalism where growth and profit are put before environmental costs (though those are certainly horrible relations). I mean the bad relations of a scientific theory that allows some amount of pollution to occur and its accompanying entitlement to Land to assimilate that pollution.[16] I mean colonialism.

The structures that allow plastics' global distribution and full integration into ecosystems and everyday human lives are based on colonial land relations, the assumed access by settler and colonial projects to Indigenous lands for settler and colonial goals. At the same time, the ways in which plastics pollute unevenly, do not follow threshold theories of harm, and act as both hosts for life and sources of harm have made plastics an ideal case to change dominant colonial concepts of pollution by teaching us about relations and obligations that

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"tolerable," thus creating a social threshold where there are no toxicological thresholds). Each has different specifics, but the same theory lies behind them. More on this in chapter 1.

14 Novotny and Krenkel, "Waste Assimilative Capacity Model," 604.

15 A dovekie is also called a bully bird, little auk, or *Alle alle*, depending on who's talking. They look like tiny puffins without the fancy beak, and you can see them flying over the water in lines. Some people in Newfoundland and Labrador eat them, but the bones are tiny, thin, and hard to pick out.

16 This argument also appears in CLEAR and EDAction, "Pollution Is Colonialism," and is expanded beautifully in Shadaan and Murphy, "Endocrine-Disrupting Chemicals as Industrial and Settler Colonial Structures." Also see Ngata and Liboiron, "Māori Plastic Pollution Expertise."

tend to be obfuscated from view by environmental rhetoric and industrial infrastructures. In CLEAR, we place land relations at the centre[17] of our knowledge production as we monitor plastic pollution in the province of Newfoundland and Labrador.

As members of a marine science lab, we are dedicated to doing science differently by foregrounding *anti*colonial land relations. This requires critique but mostly it requires action.[18] We've stopped using toxic chemicals to process samples, which means there is a whole realm of analysis we can't do. We also use judgmental sampling rather than random sampling in our study design to foreground food sovereignty when we look at plastics in food webs. CLEAR does good with pollution, in practice, in place. But CLEAR is not unique: land relations always already play a central role in all sciences, anticolonial and otherwise.

I find that many people understand colonialism as a monolithic structure with roots exclusively in historical bad action, rather than as a set of contemporary and evolving land relations that can be maintained by good intentions and even good deeds. The call for more recycling, for example, still assumes access to Indigenous Land for recycling centres and their pollution. Other people have nuanced understandings of colonialism and seek ways to deal with colonial structures in their everyday lives and research, often in spaces like the academy that reproduce colonialism in uneven ways. This book is for both groups, and others besides. Overall, this is a methodological text that begins with colonial land relations, so that we can recognize them in familiar and comfortable places (like reading, like counting), and then considers anticolonial methods that centre and change colonial land relations in thought and action.

I make three main arguments in this book. First, pollution is not a manifestation or side effect of colonialism but is rather an enactment of ongoing colonial relations to Land.[19] That is, pollution is best understood as the violence of colo-

17 Perhaps you've noticed Canadian spellings in the text even though Duke University Press is based in the United States. This is a constant, possibly annoying, reminder that these words come from a place. Spelling is method.

18 Hale, "Activist Research v. Cultural Critique."

19 Throughout this book, you'll notice that sometimes *Land* is capitalized, and sometimes it isn't. I follow the lead of Styres and Zinga (Indigenous and settler, respectively), who "capitalize Land when we are referring to it as a proper name indicating a primary relationship rather than when used in a more general sense. For us, land (the more general term) refers to landscapes as a fixed geographical and physical space that includes earth, rocks, and waterways; whereas, 'Land' (the proper name) extends beyond a material fixed space. Land is a spiritually infused place grounded in interconnected and interdependent relationships, cultural positioning, and is highly contextualized" (300–301). Likewise, when I capitalize

nial land relations rather than environmental damage, which is a symptom of violence. These colonial relations are reproduced through even well-intentioned environmental science and activism. Second, there are ways to do pollution action, particularly environmental science, through different Land relations, and they're already happening without waiting for the decolonial horizon to appear. These methods are specific, place-based, and attend to obligations. Third, I show how methodologies—whether scientific, writerly, readerly, or otherwise—are always already part of Land relations and thus are a key site in which to enact good relations (sometimes called ethics). This last point should carry to a variety of contexts that do not focus on either pollution or the natural sciences.

I use the case of plastics, increasingly understood as an environmental scourge and something to be annihilated, to refute and refuse the colonial in a good way. That is, I try to keep plastics and pollution from being conflated too readily, instead decoupling them so existing and potential relations can come to light that exceed the popular position of "plastics are bad!"—even though plastics are often bad. To start, let's dig into colonialism (spoiler: it is not synonymous with "bad" in general, though it is certainly bad).

Colonialism

Stouffer, Streeter, and Phelps all assumed access to Indigenous Land when they made their proclamations. Stouffer's declaration about the future of plastics as disposables assumed that household waste would be picked up and taken

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Land I am referring to the unique entity that is the combined living spirit of plants, animals, air, water, humans, histories, and events recognized by many Indigenous communities. When *land* is not capitalized, I am referring to the concept from a colonial worldview whereby landscapes are common, universal, and everywhere, even with great variation. For the same reason, I also capitalize *Nature* and *Resource* and, occasionally, *Science*. Rather than use a small *N* or *R* or *S* that might indicate that these words are common or universal, the capitalization signals that they are proper nouns that are highly specific to one place, time, and culture. That is, Nature is not universal or common, but unique to a specific worldview that came about at a particular time for specific reasons. Calling out proper nouns so they are also proper names is part of a tradition where using someone/thing's name is to bring it out of the shadows and engage it—in power, in challenge, in recognition, in kinship. That's why I don't mind looking like an academic elitist or naive literary wannabe when I capitalize. There's more on compromise in chapter 3. Styres and Zinga, "Community-First Land-Centred Theoretical Framework," 300–301. For other politics of capitalization in feminist sciences, see Subramaniam and Willey, "Introduction"; and Harding, *Science and Social Inequality*.

to landfills or recycling plants that allowed plastic disposables to go "away."[20] Without this infrastructural access to Indigenous Land, there is no disposability.[21] He assumed that Land would provide a sink, a place to store waste, so that profits could be generated through flows of waste-as-consumer-goods. This assumption is made easier when the Land has already been cleared of Indigenous peoples via genocide, moves to reserves, and ongoing disappearances such as those catalogued under MMIWG[22] statistics.

Streeter and Phelps likewise assumed access to Indigenous Land, though they were not capitalists dedicated to growth and profit. On the contrary, Phelps was a bold environmental conservationist. Unlike his contemporaries, he believed polluted rivers could and should be saved from, rather than abandoned to, industrial pollution by using science to keep the pollution be-

20 There is some excellent work on the concept of waste and its "away," including Davies, "Slow Violence and Toxic Geographies" and de Coverly et al., "Hidden Mountain."

21 I first made this argument in *Teen Vogue*: M. Liboiron, "How Plastic Is a Function of Colonialism." This is not the first and will not be the last time I cite myself. There are good reasons to self-cite in certain ways. First, in the words of fish philosopher Zoe Todd (Métis): "It is cheeky to cite oneself and to return to the same stories repeatedly in Euro-western academe. We are taught, as students and apprentices, that this is verboten (a well-meaning mentor even cautioned not to waste my good stories on the wrong journal, which is generally good advice for Euro-Western scholars). . . . However, Leroy Little Bear (Blackfoot) ['Big Thinking'] reminds us that 'in Native ways, we always retell our stories, we repeat them. That's how they sink in and become embodied in students and in the people.' It is through returning to the fish stories shared with me by interlocutors in Paulatuuq, and by reengaging the fish stories my family and friends share with me in amiskwaciwâskahikan, that I am brought back into my reciprocal relationships to people, moments, and responsibilities both in my research and in my engagement as a citizen of my home territory. By returning to the same moments time and time again, I unravel new facets of the relationships these stories contain and enliven." Todd, "Refracting the State," 61; Little Bear, "Big Thinking." Maarsi, Zoe Todd, for the work you do reorienting academics to good relations and manners. I admire the pedagogy your work uses to shore up unlearning and learning in the academy.

Second, I still happen to agree with myself on this point. That doesn't always happen. As I learn, I change my mind. Citing myself in specific ways marks where theories, ideas, and concepts continue to hold after they've come in continued contact with the world. Self-citation and self-quoting says, "Hey, this still works!" because so often it doesn't. I talk to many young researchers who are worried about setting their thoughts to paper because they might later change their minds. I hope you do! You will never get it *right* or *done* if you are thinking and growing. Publishing marks where you are on that path at that moment. Self-citing extends that path.

22 Missing and Murdered Indigenous Women and Girls.

low a threshold from which the rivers could recover.[23] But his theory of self-purification-cum-assimilative-capacity also assumed access to Indigenous Land. Phelps not only accessed Indigenous Land along the Ohio River to do his science; he also routinized state access by advocating for all rivers on all lands to be governed—carefully! precisely!—as proper sinks for pollution. Whether motivated by profit and growth or environmental conservation, both approaches to waste and wasting are premised on an assumed entitlement to Indigenous Land.

That's colonialism.

While there are different types of colonialism—settler colonialism, extractive colonialism, internal colonialism, external colonialism, neoimperialism—they have some things in common. Colonialism is a way to describe relationships characterized by conquest and genocide that grant colonialists and settlers "ongoing state access to land and resources that contradictorily provide the material and spiritual sustenance of Indigenous societies on the one hand, and the foundation of colonial state-formation, settlement, and capitalist development on the other."[24] Colonialism is more than the intent, identities, heritages, and values of settlers and their ancestors. It's about genocide and access.[25]

Emphasizing the role of access to Indigenous Land for colonialism, Edward Said (Palestinian)[26] writes:

> To think about distant places, to colonize them, to populate or depopulate them: all of this occurs on, about, or because of land. The actual

23 Tarr, "Industrial Wastes and Public Health," 1060. Also see Phelps's own words in Phelps, "Discussion."

24 Coulthard, *Red Skin, White Masks*, 7.

25 In her important work bringing Indigenous studies and Black studies together in *The Black Shoals*, Tiffany Lethabo King makes a strong case that analytical frames originating in White settler colonial studies that foreground land, rather than genocide and conquest, as the defining feature of colonialism miss intersectionality and grounds for coalition politics between Black and Indigenous peoples. She writes, "Genocide—and the making of the Native body as less than human, or flesh—remains the focus and distinguishing feature of settler colonialism," and that "an actual discussion of Native genocide is displaced by a focus on White settlers' relationship to land rather than their parasitic and genocidal relationship to Indigenous and Black peoples" (56, 68). Yes, yes, yes. I also think that Land relations, and thus the emplacement of more-than-human relations, are one of the keystones to doing anticolonial work as a Métis scientist. So I focus on Land here, and the inheritance of scientific land relations, knowing that this is shorthand for genocide. Also see Trask, *From a Native Daughter*; and Trask, "The Color of Violence."

26 This self-identification is in Said, "Zionism from the Standpoint of Its Victims."

> geographical possession of land is what empire in the final analysis is all about. At the moment when a coincidence occurs between real control and power, the idea of what a given place was (could be, might become), and an actual place—at that moment the struggle for empire is launched. This coincidence is the logic both for Westerners taking possession of land and, during decolonization, for resisting natives reclaiming it.[27]

Let's take a moment to focus on that bit about Westerners. Western culture—the heritage of social norms, beliefs, ethical values, political systems, epistemologies, technologies, and legal structures and traditions heavily influenced by various forms of Christianity and Judaism that have some origin in Ancient Greece and which heavily influenced societies in Europe and beyond—is not synonymous with colonialism. Western culture certainly has its imperialistic and colonial impulses, histories, and ideas of what is good and right, but these are different things from colonialism. When I hear a researcher ask, "Isn't doing research ethics paperwork colonial?," they are conflating Western and colonial. Remember: treaties are paperwork. If paperwork is used to possess land and secure settler and colonial futures, then, yes, it's colonial. But there is also anticolonial, Western-style paperwork that accomplishes the opposite, like the forms required by Indigenous research ethics boards. Colonialism, first, foremost, and always, is about *Land*, including the circumvention of ethics paperwork so researchers can have unfettered and unaccountable access to field sites (a.k.a. homelands), archives, samples, and data.[28]

The focus on Land—what it could be, what it might become, what it is for—does not always mean accessing Land as property for settlement, though it often does. It can also mean access to Land-based cultural designs and culturally appropriated symbols for fashion. It can mean access to Indigenous Land for scientific research. It can mean using Land as a Resource, a practice that may generate pollution through pipelines, landfills, and recycling plants, or as a sink to store or process waste. It can mean imagining a clean, healthy, and pollution-free future and conducting beach cleanups on Indigenous Land without permission or consent. It means imagining things for land in ways that align with colonial and settler goals, even when those goals are well intentioned. Especially when they are well intentioned. Which means it's time to talk about environmentalism.

27 Said, *Culture and Imperialism*, 93.

28 E.g., Lawford and Coburn, "Research, Ethnic Fraud, and the Academy."

Environmentalism and Colonialism

Environmentalism does not usually address colonialism and often reproduces it. Philosopher Kyle Whyte (Potawatomi),[29] Dina Gilio-Whitaker (Colville Confederated Tribes),[30] and many others[31] have pointed out that environmental solutions to pollution such as hydroelectric dams,[32] consumer responsibility, and appeals to the commons[33] assume access to Indigenous Land and its ability to produce value for settler and colonial desires and futures. Environmentalism often "propagate[s] and maintain[s] the dispossession of [I]ndigenous peoples for the common good of the world."[34]

For example, in September 2015, a US-based environmental NGO called the Ocean Conservancy released a report looking for solutions to marine plastic pollution that recommended that countries in Southeast Asia work with foreign-funded industries to build incinerators to burn plastic waste.[35] This recommendation follows a long line of colonial acts in the name of plastics, from accessing Indigenous Land to extracting oil and gas (and occasionally corn) for feedstock; to producing disposable plastics that use land to store, contain, and assimilate the waste; to pointing the finger at local "foreign" and Indigenous peoples for "mismanaging" waste imported from industrial and colonial centres; and then gaining access to that Land to solve their uncivilized approach to waste (mis)management.[36]

This is not to say that the Ocean Conservancy is evil, or even aware of its colonial mindset. Colonialism doesn't come from asshat goons, though it cer-

29 Whyte, "Dakota Access Pipeline."

30 Gilio-Whitaker, *As Long as Grass Grows*.

31 paperson, "Ghetto Land Pedagogy"; Osborne, "Fixing Carbon, Losing Ground"; Osborne, Bellante, and vonHedemann, *Indigenous Peoples and REDD+*.

32 Nunatsiavut Government, "Make Muskrat Right."

33 Fortier, *Unsettling the Commons*.

34 Byrd, *Transit of Empire*, xix.

35 Ocean Conservancy, "Stemming the Tide."

36 The term *mismanaged waste* has gained traction since a scientific publication estimating the amount of plastics entering the oceans used the category of mismanaged waste to estimate plastic leakage from land to the ocean. The problem is that everyone whose waste management did not look like the United States was automatically labelled *mismanaged*. The term signals that the infrastructure in question isn't quite Civilized enough. A detailed critique of this study and its colonial premises is in chapters 1 and 2. For community and grassroots pushback to this report, see GAIA Coalition, "Open Letter to Ocean Conservancy."

tainly has a large share of such agents. Colonial land relations are inherited as common sense, even as good ideas.[37] Many environmental historians have shifted their understanding of the origins of environmentalism well before back-to-the-land and save-the-(access-to-)land movements of the 1960s and 1970s. Instead they highlight earlier imperial archiving, cultivation, and control measures necessary for the flourishing of empire around the globe, both within and outside of what is lately called North America.[38] They argue that the colonial scientists who attempted to mitigate and halt environmental destruction in colonies so that the colonies might flourish are "the pioneers of modern environmentalism,"[39] where "environmentalism is police action, inseparable from western conceptions and attitudes"[40] of how to best organize and govern land (more on this in chapter 1).

The way that environmental crises and their solutions maintain rather than change existing power structures is central to the scholarship of anthropologist Joseph Masco (settler), who points out that "crisis," environmental and otherwise, has "become a counterrevolutionary idiom in the twenty-first century, a means of stabilizing an existing condition rather than minimizing forms of violence across militarisms, economy, and the environment."[41] Rather than using crisis as a relational model that puts certain things beyond dispute in the imperative to act at all costs, I focus on colonial land relations within environmental narratives and action as a way to acknowledge and address this usually unmarked power dynamic.

37 Here, I am drawing on Foucault's (unmarked) articulation of power as regimes of truth that allow some things to make sense, to circulate, and to act as truth, while others do not. See Foucault, *Discipline and Punish*. However, following Michelle Murphy (Métis), I build on this work "unfaithfully," as "Foucault's own work on neoliberal economics refuses to engage with colonial and postcolonial histories, the elaboration of the racial state, and drops sex as a central analytic." Murphy, *Economization of Life*, 149.

38 Anker, *Imperial Ecology*; Komeie, "Colonial Environmentalism."

39 Grove, "Origins of Environmentalism," 12. I think Grove and I see eye to eye on the term *pioneer* here.

40 Barton, *Empire Forestry*, 6.

41 Masco, "Crisis in Crisis," S65. Also see Masco, "Bad Weather." Joe Masco, thank you not only for your excellent, careful, original, and insightful work on the links between environmental and military crises, but, more importantly (to me and as a model in the academy), for your genuine generosity, solid and obvious forms of support, forceful and inspiring yet gentle curiosity, and feminist, caring ways that you invest in emerging intellectuals. Thank you, Joe, for taking time and care to be part of this book's life (and mine!).

Capitalism and Colonialism

To change colonial land relations and enact other types of Land relations requires specificity. This is so we don't accidentally think that the opposite of colonialism is environmentalism or, similarly, that we don't conflate colonialism with other forms of extraction, such as capitalism. Colonialism and capitalism might be happy bedfellows and indeed longtime lovers, but they are not the same thing.

Political economist Karl Marx (unmarked) argues that primitive accumulation (the stealing of land) is foundational to the possibility of capitalism—it's how someone gets more capital than someone else in the first place, which you need to jump-start a system where only a few people own the means of production.[42] You can't make and hoard capital without stealing Land first. We have case studies of how aspects of capitalist production and technologies allow specific forms of colonialism and dispossession to take root and spread.[43] Likewise, excellent research describes the sweet trifecta of capitalism, colonialism, and pollution. The treadmill of industrial and capitalist production is ever in need of more Land to contain its pollution,[44] leading to the argument that "contamination and resource dispossession [are] necessary and inherent factors of capitalism."[45]

Yet colonial quests for Land are different than capitalist goals for capital, even if pollution has a role in attaining each goal. Socioeconomic systems other than capitalism also create environmental pollution and waste,[46] but what is more important for understanding the relationship between capitalism and colonialism is that many different economic systems depend on access to Indigenous Land. As Sandy Grande (Quechua) has argued, "Both Marxists and capitalists view land and natural resources as commodities to be exploited, in the first instance, by capitalists for personal gain, and in the second by Marxists for the good of all."[47] Eve Tuck (Unangax) and Wayne Yang (diaspora settler of colour) have pointed out, "Socialist and communist empires have also been settler empires (e.g., Chinese colonialism in Tibet)."[48] Colonialism is not one kind of

42 Marx, "The Modern Theory of Colonisation," chap. 33 in *Capital*, vol. 1.

43 Denoon, *Settler Capitalism*; Pasternak, "How Capitalism Will Save Colonialism."

44 Voyles, *Wastelanding*.

45 Ofrias, "Invisible Harms, Invisible Profits," 436.

46 Gille, *From the Cult of Waste*; Kao, "City Recycled"; Scheinberg and Mol, "Multiple Modernities." We need a lot more research in this area.

47 Grande, *Red Pedagogy*, 31.

48 Tuck and Yang, "Decolonization Is Not a Metaphor," 4.

thing with one set of techniques that always align with capitalism. Marxism, socialism, anticapitalism, capitalism, and other economic systems can, though certainly don't have to, enact colonial relations to Land as a usable Resource that produces value for settler and colonizer goals, regardless of how and by whom that value is produced.

Colonialism, capitalism, and environmentalism do not have settled relationships or forms.[49] For instance, colonialist states and powers have at times sided with environmental conservation over capitalist gains. Historians have documented how, as Richard Grove (unmarked) puts it, "Paradoxically, the colonial state in its pioneering conservationist role provided a forum for *controls* on the unhindered operations of capital for short-term gain which, it might be argued, brought about a contradiction to what is normally supposed to have made up the common currency of imperial expansion. Ultimately, the long-term security of the state, which any ecological crisis threatened to undermine, counted for far more than the interests of private capital bent on the destruction of the environment."[50] To make capitalism and colonialism synonymous, or to conflate environmentalism and anticolonialism, misses these complex relations.

Because of this nuance and its repercussions for political action, political scientist Glen Coulthard (Yellowknives Dene) has called for scholars to shift their analysis away from capitalist relations (production, proletarianization) to colonial relations (dispossession, Land acquisition, access to Land): "Like capital, colonialism, as a structure of domination predicated on dispossession, is not a 'thing,' but rather the sum effect of the diversity of interlocking oppressive social relations that constitute it. When stated this way, it should be clear that shifting our position to highlight the ongoing effects of colonial dispossession in no way displaces questions of distributive justice or class struggle; rather, it simply situates these questions more firmly alongside and in relation to the other sites and relations of power that inform our settler-colonial present."[51] Conflating colonialism with capitalism misses crucial relations, which Coulthard argues include white supremacy and patriarchy. Aileen Moreton-Robinson (Geonpul,

49 Feminist geographers like J. K. Gibson-Graham (unmarked) have done excellent work showing how capitalism is not only diverse in its manifestations, but also patchy and incomplete. They argue that to describe capitalism as a total and complete system is to give it power it does not necessarily have. Gibson-Graham, "End of Capitalism"; Gibson-Graham, "Rethinking the Economy."

50 Grove, "Origins of Environmentalism," 12; emphasis added. This is an appropriate use of the term *pioneering*.

51 Coulthard, *Red Skins, White Masks*, 15.

Quandamooka First Nation) has shown that it misses racial formations and racism.[52] For thinkers such as Tuck and Yang, the "homogenization of various experiences of oppression as colonialism"—that is, conflating imperialism, racism, capitalism, exclusion, and general bad behaviour with colonialism—accomplishes "a form of enclosure, dangerous in how it domesticates decolonization. It is also a foreclosure, limiting in how it recapitulates dominant theories of social change."[53]

Differentiation and specificity matter to ensure that actions address problems, and the conflation of colonialism with other ills ensures the erasure of horizons of meaningful action that can attend specifically to assumed settler and colonial entitlement and access to Land. In the case of pollution, a focus on capitalism misses relations that make Land available for pollution in the first place. It can miss the necessary place of stolen Land in colonizers' and settlers' ability to create sinks for pollution *as well as* stolen Land's place in alternative economies (via a communal commons) and environmental conservation (via methylmercury-producing hydroelectric dams).

Pollution, scientific ways to know pollution, and actions to mitigate pollution are not examples of, symptoms or metaphors for, or unintentional by-products of colonialism, but rather are essential parts of the interlocking logics (brain), mechanisms (hands and teeth), and structures (heart and bones)

52 Moreton-Robinson, *White Possessive*. Thank you, Aileen Moreton-Robinson, for the political and intellectual move of foregrounding identity and culture as the primary grounds from which to make claims and change. I think this is a key lesson for activism: "Patriarchal white nation-states and universities insist on producing cultural difference in order to manage the existence and claims of Indigenous people. In this way the production of knowledge about cultural specificity is complicit with state requirements for manageable forms of difference that are racially configured through whiteness." Moreton-Robinson, *White Possessive*, xvii.

53 Tuck and Yang, "Decolonization Is Not a Metaphor," 17, 3. I wish to express a deep gratitude for your work, Eve Tuck, and especially for "Suspending Damage," which has profoundly shaped my research, including the way this book was framed and written. Tuck's open letter is, in many ways, directly responsible for turning my work from being about plastic to being about colonialism. It is part of a shift that took place in my scientific work from attempting to create an accounting of chemical harms by counting plastic to articulating food sovereignty (details on this method are in chapter 3). I re-read "Suspending Damage" and "Decolonization Is Not a Metaphor" at least once a season, as an event to sit with the text, rather than as a source to pull things from (a reading technique I strengthened after reading some of your tweets on extractive reading practices). Your work has easily been some of the most formative in my intellectual and ethical journey. Thank you, Eve Tuck, for your brilliance, pedagogy, and ethics.

of colonialism that allow colonialism to produce and reproduce its effects in Canada, the United States, and beyond.[54] Colonialism is not just about taking Land, though it certainly includes taking Land. Stealing is a manifestation, a symptom, a mechanism, and even a goal of colonialism. But those are the teeth of colonialism, and I want to look at its bones. Stealing Land and dispossessing people are events with temporal edges, but ongoing Land theft requires maintenance and infrastructure[55] that are not as discrete, given that "colonization is a continuing process, not simply a historical event."[56] Colonialism is a set of specific, structured, interlocking, and overlapping relations that allow these events to occur, make sense, and even seem right (to some).[57] I will argue throughout this text that these relations—their types, durations, effects, and maintenance—are also enacted by pollution and pollution science.

Otherwises and Alterlives

When I first began researching plastic pollution around 2008, I thought that plastics had the immense potential to blow concepts of pollution out of the water,[58] since they defy so many scientific and popular truisms. You can't "clean up"

54 There are different colonialisms, imperialisms, and indigeneities because these things are place- and time-based. When I speak in general terms, statements are rooted in relations from Newfoundland and Labrador and early teachings in Alberta, Canada. They will not make global sense (more on the difference between universalism and generalization of knowledge in chapter 3).

55 For an example of interlocking infrastructures at multiple scales that maintain Land theft (even as they fail!), see Pasternak, *Grounded Authority*. This text is particularly good for discussions of how Indigenous jurisdiction and Land are consistently usurped in place, particularly by the state through mechanisms of financialization and "accountability." It is also an excellent text for studying/punching up, for showing how Canadian state sovereignty and jurisdiction consistently fall short and are patchy, even though they are often assumed to be solidly in place. Thank you, Shiri Pasternak (settler), for your excellent work.

56 Anguksuar, "Postcolonial Perspective." Also see the more oft-cited Wolfe, *Settler Colonialism*.

57 Sandy Grande writes about the animating beliefs and logics that underpin colonial societies that serve as the basis for common sense. These core beliefs are as follows: (1) belief in progress as change and change as progress; (2) belief in the effective separateness of faith and reason; (3) belief in the essential quality of the universe and of "reality" as impersonal, secular, material, mechanistic, and relativistic; (4) subscription to ontological individualism; and (5) belief in human beings as separate from and superior to the rest of nature. While this text focuses on the third and fifth beliefs, and particularly how they manifest in pollution science, all five are part of how land is understood and related to. Grande, *Red Pedagogy*, 69.

58 Pun!

plastics because they exist in geological time, and cleaning just shuffles them in space as they endure in time.[59] You can't recycle them out of the way, because it means ever more will be produced,[60] and there is no "away" at any rate.[61] Many of the chemicals associated with plastics, called endocrine disruptors, defy thresholds and exceed the adage that the "danger is in the dose" or the "solution to pollution is dilution" because they cause harm at trace quantities already present in the environment and bodies.[62] Plastics and their chemicals defy containment, a hallmark approach to industrial waste management, as they blow, flow, and off-gas so that their pollutants are ubiquitous in every environment tested.[63] Last but hardly least, their long temporality means their future effects are largely unknown,[64] making uncertain the guarantee of settler futures. I thought these traits would provide pollution science and activism with the case they needed to move beyond thresholds of allowable harm, beyond disposability, and beyond the access to Land that both thresholds and "away" require.[65] But despite con-

59 Gray-Cosgrove, Liboiron, and Lepawsky, "Challenges of Temporality."

60 MacBride, "Does Recycling Actually Conserve or Preserve Things?" Thank you, Samantha MacBride (unmarked). You are one of the smartest, most careful, most multiscalar and interdisciplinary thinkers I have had the pleasure to know intellectually (and personally!) when it comes to waste streams and recycling in the United States. You are a role model for how you put your intelligence to work as the director of research at the New York City Department of Sanitation. If I had to teach only one text on waste, it would be yours: MacBride, *Recycling Reconsidered*. Thank you, Samantha MacBride, for all the forms of work you do and particularly how you do it.

61 Davies, "Slow Violence and Toxic Geographies"; Bullard, *Dumping in Dixie*.

62 E.g., Vandenberg, "Low-Dose Effects of Hormones and Endocrine Disruptors."

63 Bergman et al., "Impact of Endocrine Disruption," A104; vom Saal et al., "Chapel Hill Bisphenol A Expert Panel Consensus Statement," 131.

64 You may have noticed that temporal estimates of plastics breaking down (one thousand years for this kind of plastic, ten thousand for this other kind) exceed the amount of time that plastics have existed. Most of these estimates are modeled from data created in labs (in UV-saturated, vibrating, acidic set-ups that rarely mimic actually existing environmental conditions) and are based on the idea that the rate of weakening polymer bonds will proceed on a regular curve. They do not anticipate the effects of metabolites or the molecular chains that polymers might break into. They cannot anticipate how future environmental relations will absorb, adapt to, and otherwise influence these rates of breakdown or the effects of many types of plastics in diverse environments over long periods.

65 This is what feminist STS scholars such as Martha Kenney (unmarked) and others might call *response-ability*: "*cultivating the capacity for response*. Recent works in feminist science studies have proposed *response-ability* as a term that might whet our imaginations for more relational ethics and politics enacted in everyday practices of living in our more-

siderable and sustained public, scientific, and policy attention to plastic pollution, most pollution science and activism have not shifted this way (with a few notable exceptions[66]).

As feminist scholar Susan Leigh Star (unmarked) reminds us, "It might have been otherwise."[67] In fact, it has been. There are and have been other definitions of and relations to pollution. Not all pollution is colonial, but the idea of modern environmental pollution[68] certainly is (more on this in chapter 1). Be-

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than-human world." Kenney, "Fables of Response-Ability," 7; emphasis in original. Also see work by María Puig de la Bellacasa (unmarked), Donna Haraway (unmarked), Alexis Shotwell (unmarked), Karen Barad (unmarked), Lucy Suchman (unmarked), Kim Fortun (unmarked), Aryn Martin (unmarked), Natasha Myers (settler), Michelle Murphy (Métis), Shawn Wilson (Cree), Dwayne Donald (Cree), Zoe Todd (Métis), Kim TallBear (Sisseton-Wahpeton Oyate), Sara Tolbert (unmarked), and Winona LaDuke (Anishinaabe) on accountability and responsibility in relations.

66 Settler scientists such as Chelsea Rochman (unmarked), Laura Vandenberg (unmarked), and Fred vom Saal (unmarked), among others, have all written about the chemical hazards of plastics and their associated chemicals and the way science, industry, and policy ought to relate to one another. They work within dominant science to shift the conversation. I'll speak more about some of their work in chapter 2. See, e.g., Rochman et al., "Policy"; Vandenberg et al., "Regulatory Decisions on Endocrine Disrupting Chemicals"; vom Saal and Hughes, "Extensive New Literature." Global Alliance for Incinerator Alternatives (GAIA) is also exemplary for its insistence in looking upstream at industry and political alliances for the source of marine plastics and has folded critiques of capitalism and colonialism into its work. GAIA has also proposed some shifts in scientific methods of monitoring marine plastics, which I discuss in chapter 2. See GAIA, "Plastics Exposed."

67 Star, "Power, Technology, and the Phenomenology of Conventions," 53.

68 I use the term *modern pollution* to mean post-miasma theories of environmental pollution based on quantitative science, threshold limits, and industrial capture. In *Risk and Blame*, white primitivist anthropologist Mary Douglas (British) differentiates between cultural notions of pollution and "technical" senses: "There is a strict technical sense, as when we speak of river or air pollution, when the physical adulteration of an earlier state can be precisely measured. The technical sense rests upon a clear notion of the prepolluted condition. A river that flows over muddy ground may be always thick; but if that is taken as its natural state, it is not necessarily said to be polluted. The technical sense of pollution is not morally loaded but depends upon measures of change. The other sense of pollution is a contagious state, harmful, caused by outside intervention, but mysterious in its origins." Douglas, *Risk and Blame*, 36. But one of my primary arguments is that this "technical" sense of pollution is indeed morally loaded with the values and goals of colonialism and that there is therefore no real difference between Douglas's categories. I nevertheless use the term *modern environmental pollution* to highlight, as Douglas does, the recent origins and culturally specific aspects of scientific definitions of pollution.

fore the threshold model of pollution pioneered[69] by Streeter and Phelps, there were many definitions of pollution that shared a more prohibitive and normative slant. The English word *pollution* comes from the Latin *pollutionem*, meaning defilement or desecration. The earliest recorded uses in the mid-fourteenth century refer to the "discharge of semen other than during sex."[70] This may seem like a brilliant idea, but in the Christian Middle Ages extracoital dissemination was written up as an act of desecration, an interruption of the true and right path for semen. Pollution was (and still is) about naming a deviation from the good and true path of things—good relations manifested in the material. Though it wasn't until 1860 that the term *pollution* was recorded in the sense of environmental contamination,[71] the morality and ideas of good and right paths for contaminants remain a key aspect of understanding pollution today. These moral overtones still circulate in environmental science even while we scientists argue that we are measuring wayward particles rather than immoral acts.[72]

Both pollution and plastics have been otherwise, with different and varied interpretations and enactments. The stakes of my research are to open up plastics and pollution so that they are otherwise, yet related, once more (and still). By denaturalizing and demythologizing pollution in general and plastics in particular, I aim to make (more) apparent their ongoing relationships to maintaining colonial Land relations as well as to anticolonial Land relations. That way, when we want to do scientific and/or activist work that does not reproduce colonial L/land relations, we know where we stand and what we mean.

69 Yes, pioneered in the spirit of land acquisition via frontierism and the erasure of other forms of Land relation.

70 Online Etymology Dictionary, s.v. "pollution," accessed August 12, 2020, https://www.etymonline.com/word/pollution.

71 Online Etymology Dictionary, s.v. "pollution."

72 An interesting example of this is that environmental scientists consistently eschew their training to say that the presence of plastics in environments is a form of harm, while the dominant scientific model of pollution distinguishes between contamination (presence) and pollution (demonstrated harm). In "The Ecological Impacts of Marine Debris," Chelsea Rochman and collaborators argue that conflating the two might actually work against conservationist goals, since it gives a space for the plastics and petrochemical industries to defer action by saying harm must be demonstrated beyond presence. I agree with Rochman et al. in a sense. But I extend their argument to say that embracing an idea of pollution as bad relations that can exceed scientific evidence of harm is exactly what we need. If you're going to go with a more overtly "anthropological" set of value-based definitions of pollution as bad relations, do it and do it loud, which means not conflating it with other (scientific) models of pollution with different values and goals.

As such, my orientation for this book is a specific enactment of a *particular* otherwise. Following Michelle Murphy's concept of alterlife, I seek "words, protocols, and methods that might honor the inseparability of bodies and land, and at the same time grapple with the expansive chemical relations of settler colonialism that entangle life forms in each other's accumulations, conditions, possibilities, and miseries."[73] When I am taking plastics out of birds' gizzards one by one with tweezers, I am searching for these words, protocols, and methods *as a scientist*. I want to know whether or how to use an available threshold-based measurement in plastic pollution research (called the EcoQO) when I don't think threshold models are in good relation yet know that the measurement is one of the few effective for policy. I think about how my colleague got this bird to begin with—was it in good relations, or did it assume entitlement to Land? Whose water am I using to clean these plastics, anyhow? And, most importantly, when Murphy writes, "The concept of alterlife is offered as a way of approaching the politics of relations in solidarity with the vast labor of anti-racist and decolonial reproductive and environmental justice activism, as well as Indigenous survivance and resurgence,"[74] the methodological question is: how do I get to a place where these relations are properly scientific, rather than questions that fall outside of science, the same way ethics sections are tacked on at the end of a science textbook? How do I, as a scientist, make alterlives and good Land relations integral to dominant scientific practice?

There is no terra nullius for this work. Western science has long been identified as a practice that assumes mastery over Nature, reproduces the doctrine of discovery, revels in exploration and appropriation of Indigenous Land, and is invested in a rigorous self-portraiture[75] in which valid scientific knowledge is created only by proper European subjects.[76] It's also pretty sexist. But dominant science[77] is my terrain. At CLEAR, we use science against science, understand-

73 Murphy, "Alterlife and Decolonial Chemical Relations," 497. Thank you, Michelle Murphy, for so many reasons. For your scholarship, which has grounded the thinking of multiple generations of STS scholars, and for the way you mentor and create spaces, lessons, and examples for good relations in academia and beyond. Your work and practices make diverse futures for so many of us (a.k.a. legacy). I cannot overstate the effects of your intelligence, generosity, and ethics on me and so many others. Maarsi.

74 Murphy, "Against Population, towards Alterlife," 118.

75 Daston, "History of Science."

76 Seth, "Putting Knowledge in Its Place."

77 I use the term *dominant science* instead of *Western science* for two reasons. First, *dominant* keeps the power relations front and centre, and it's these power relations I am usually discussing. Western science is a cultural tradition where ways of knowing start with the

ing that science is always already fucked up, which means that our work is always compromised (a concept I explain more in chapter 3). To imagine a clean slate from which to start our anticolonial science is to subscribe to "terra nullius, the colonizer's dream," described by feminist scholar Raewyn Connell (settler) as "a sinister presupposition for social science. It is invoked every time we try to theorise the formation of social institutions and systems from scratch, in a blank space. Whenever we see the words 'building block' in a treatise of social theory, we should be asking who used to occupy the land."[78] Research and change-making, scientific or otherwise, are always caught up in the contradictions, injustices, and structures that already exist, that we have already identified as violent and in need of change.[79] This text is about maneuvering within this complex and compromised terrain.

This compromise of doing both Indigenous and anticolonial work in science and academia[80] is something that many Indigenous thinkers contend with when they enter academia.[81] CLEAR member Edward Allen (Kablunangajuk) opens his doctoral comprehensive exam with the following words:

> The academy will have to embrace wholesale change in what it qualifies as legitimate knowledge production and pedagogy if it is to capture any Indigenous knowledges in any meaningful way.[82] Until the hurdles are cleared, I will continue to write as if footed in both worlds. This with op-

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Ancient Greeks, get influenced by various forms of Christianity and Judaism, and move through the Enlightenment. Generally, I have no problem with that culture. The problem is when it becomes dominant to the point that other ways of knowing, doing, and being are deemed illegitimate or are erased. Second, not all Western science is dominant. Midwifery, alchemy, and preventative medicine are part of Western science that suffer at the hands of dominant science.

78 Connell, *Southern Theory*, 46.

79 For an excellent example of how the politics of denunciation can reproduce the wider system of uneven power relations that it seeks to denounce, see Fiske, "Dirty Hands." For more on what is compromised in conducting basic science for justice, including community science, see Shapiro, Zakariya, and Roberts, "Wary Alliance." For more on how many scientists already know this, see O'Brien, "Being a Scientist."

80 Many academics state that academia is colonial, and they're quite right. But they usually aren't specific as to the intentional roles that universities played in imperialism and the disciplining and oppressions of Indigenous peoples. Now you can be specific: Pietsch, *Empire of Scholars*. But you can also be nuanced and generous: paperson, *A Third University Is Possible*.

81 E.g., S. Wilson, *Research Is Ceremony*; A. Simpson, "On Ethnographic Refusal."

82 He cites Bang, Medin, and Cajete, "Improving Science Education for Native Students."

timism of at least some small piece of the original story being heard, to imitate my Elders (and my occasional Western teacher) who speak from the heart and exercise compassion when faced with shortcomings (as has been done repeatedly for me), and to reluctantly trade the risk of harm for any opportunity to contribute to change from the inside. But, in the short list of things I claim to grasp, I am confident that you *cannot* come to a full understanding of Indigenous concepts of relationality in this [written] format, even if I were to produce here the best academic paper ever written.[83]

These existing terrains are the fertile, toxic grounds[84] for alterlife:

> A politics of non-deferral that is a commitment to act now. But this politics of non-deferral is not driven by the logic of the emergency, the scale of the planetary, or the container of the nation state. It is a politics of non-deferral interested in the humbleness of right here, in the scale of communities, and in the intimacies of relation. Alterlife is a challenge to invent, revive, and sustain decolonizing possibilities and persistences right now as we are, forged in non-innocence, learning from and in collaboration with past and present projects of residence and resurgence.[85]

Let's begin.

Differences and Obligations

Different groups have different roles in alterlives, reconciliation, decolonization, indigenization, and anticolonial work. An ongoing issue at CLEAR, which includes Indigenous people, local and come-from-away settlers, as well as those who are neither Indigenous nor settler, such as international students from Nigeria,[86] is how to take up science that enacts good Land relations without appropriating Indigenous Land relations if they aren't yours (including when they belong to a different Indigenous group). I keep talking about specificity. Here, I think of specificity as a methodology of nuanced connection and humility,[87]

83 E. Allen, "Neighboring Ontologies."

84 Land can be polluted and still foster good land relations. See, e.g., Konsmo and Recollet, afterword; and Hoover, "Cultural and Health Implications of Fish Advisories," 4.

85 Murphy, "Against Population, towards Alterlife," 122–23.

86 Vowel, *Indigenous Writes*.

87 For more on humility, see L. Simpson, *Dancing on Our Turtle's Back*; and Kimmerer, *Braiding Sweetgrass*.

rather than as a way to substantiate uniqueness. Anthropologist Tim Choy's (unmarked) work is exemplary for showing how specificity, when used methodologically, has varied political allegiances and outcomes, from speciesism to state autonomy.[88] Rather than mobilize specificity and particularism for categorization, I want to call attention to their ability to situate differences that matter to political action.[89]

Problems, Theories, and Methods of We

The joke was old even before it appeared in print:

> The Lone Ranger and Tonto find themselves surrounded by hostile Indians. The Ranger asks Tonto: "What are we going to do, Tonto?" To which Tonto replies: "What do you mean we, white man (or paleface, or kemo sabe, depending on the version)?"
>
> Its racist ancestry is undeniable: the joke partly evokes the picture of a feckless subordinate who will treacherously abandon his superior at the first sign of trouble—usually with the ethnic or social group to which the subordinate belongs. But even before 1956, ancient variants of the joke were meant to deflate the condescension of individuals who used the royal "we," and the insulting presumption of people who assumed, for their own purposes, what they had no business assuming.[90]

We is rife with such assumptions. A familiar, naturalized narrative about environmental pollution is that We are causing it. We are trashing the planet. Humans are inherently greedy, or wasteful, or addicted to convenience, or naturally self-maximizing, and are downright tragic when it comes to "the" commons. On the other side of the coin, We must rise up, work together, refuse plastic straws, act collectively, and put aside our differences.

I'm not going to dwell on how We erases difference and power relations, or how it makes a glossy theory of change that doesn't allow specific responsibil-

88 Choy, *Ecologies of Comparison*.

89 This is what feminist Elizabeth Grosz (unmarked) might define as the type of difference that is "not seen as different from a pregiven norm, but as pure difference, difference in itself, difference with no identity." Grosz, "Conclusion," 339.

90 Ivie, "What Do You Mean 'We,' White Man?" Also see Heglar, "Climate Change Ain't the First Existential Threat"; Hecht, "African Anthropocene"; and Whyte, "Is It Colonial Déjà Vu?" All of these pieces break out of the violence and myopia of "we" as a way to critique mainstream environmental narratives, including the notion of the Anthropocene (which is also a key critique in Murphy, "Alterlife and Decolonial Chemical Relations").

ity.[91] Here, I want to focus on responsibility—the obligation to enact good relations as scientists, scholars, readers, and to account for our relations when they are not good. And you can't have obligation without specificity.

We isn't specific enough for obligation. You know this—an elder daughter has different obligations than a mail carrier, and you have different obligations to your elder daughter than to the mail carrier. DuPont has different obligations to plastic pollution than someone with a disability who uses a straw to drink. Even though I'm sure you've heard that "everything is related" in many Indigenous cosmologies, this doesn't mean there is a cosmic similitude of relations. You are not obliged to all things the same way.[92] Hence there is a need for specificity when talking about relations.

There can be solidarity without a We. There *must* be solidarity without a universal We. The absence of We and the acknowledgement of many we's (including those to which you/I/we do not belong[93]) is imperative for good re-

91 If you want some more of that, see M. Liboiron, "Against Awareness, for Scale"; and M. Liboiron, "Solutions to Waste." There is also an entire chapter on the problems of We in a currently in-progress manuscript called *Discard Studies* that I am writing with excellent collaborator Josh Lepawsky (settler).

92 The idea that obligations are specific is put into practice by many different Indigenous thinkers, but this guiding principle is not exclusive to Indigenous groups. I think of New Orleans activist Shannon Dosemagen (unmarked), director of the Public Lab for Open Technology and Science, whose understandings of relations as the primary source, goal, and ethic of community science have led to a career in bringing people together in a good way and building technologies and platforms to support those relations. See Dosemagen, Warren, and Wylie, "Grassroots Mapping." I also think about Labrador-based scholar Ashlee Cunsolo (settler), director of the Labrador Institute, whose directorship is premised on building and maintaining relations in a context of complex geopolitics and competing interests, and who exemplifies humility, generosity, and gratitude in every setting I've seen her in. See Cunsolo and Landman, *Mourning Nature*. Shannon and Ashlee, thank you for your examples of putting the relational politics that so many people talk about into practice in ways that far exceed the cultural and ethical norms of your existing institutions. It has been a great gift being activist-administrators with you.

93 Acknowledging where you do not belong while remaining aligned with those who do seems to be one of the more difficult lessons of allyship. I recently attended an "Indigenous LGBTQ2S+" gathering where white and non-Indigenous allies were thanked for attending, but then asked to leave so we could build a certain type of community. The settler sitting beside me didn't leave. She was clearly nervous and unsure of what to do, but her inability to choose the embarrassment of standing up and leaving, and thereby outing herself as a white person, over the choice to stay in a place she had been asked to leave by those she was there to support meant that she probably isn't ready for the even harder choices involved in allyship. Because of her choice to stay, I have never been in a room filled only

lations in solidarity against ongoing colonialism and allows cooperation with the incommensurabilities of different worlds, values, and obligations. There are guidebooks to doing careful, specific solidarity work across difference.[94]

Indigenous science and technology studies (STS) scholar Kim TallBear has written about "standing with" as a methodological approach to doing research in good relation. In her work, she writes that she "had to find a way to study bioscientists (whose work has profound implications for indigenous peoples) in a way in which I could stand more within their community," rather than critiquing them from a place of confrontation and not-caring—an approach that she argues is bad feminist practice. She now moves "towards faithful knowledges, towards co-constituting my own knowledge in concert with the acts and claims of those who I inquire among."[95] Indigenous peoples, settlers, and others have different roles and responsibilities in the "challenge to invent, revive, and sustain decolonizing possibilities and persistences."[96] Rather than fixing or saving one another, "giving back,"[97] or assuming that ongoing colonial Land relations only harm Indigenous people, "within the condition of alterlife the potential for political kinship and alter-relations comes out of the recognition of connected, though profoundly uneven and often complicit, imbrications in the systems that distribute violence."[98] This is investment without assumed access to our subjects and areas of research.

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with Indigenous queer folk. Because of her choice, I had to take time to teach her when she was ignorant of something a speaker said. You can stand with a group without standing in their midst. In fact, sometimes standing-with-but-over-there is the best place to stand. A similar story is told by Sara Ahmed in the context of trying to have a Black Caucus professional meeting in *On Being Included*. I'm sure you have your own stories.

94 Land, *Decolonizing Solidarity*; Gaztambide-Fernández, "Decolonization and the Pedagogy of Solidarity"; Walia, "Decolonizing Together"; TallBear, "Standing with and Speaking as Faith"; Amadahy and Lawrence, "Indigenous Peoples and Black People in Canada."

95 TallBear, "Standing with and Speaking as Faith," 5. Thank you, Kim, for your big, bold, out-in-public work and thinking as well as your tableside, quieter talks. I'm sure you know that your work—written scholarship, Twitter essays and jokes, gathering and organizing—props the door open for so many others, and for this I am grateful. Also, love the hair. Maarsi, Kim.

96 Murphy, "Against Population, towards Alterlife," 122–23.

97 TallBear writes about Gautam Bhan's (Indian) notion of "continuous and multiple engagements with communities and sites of research rather than a frame of giving back," which maintains a benevolent narrative of wealth and deficit. TallBear, "Standing with and Speaking as Faith," 2.

98 Murphy, "Against Population, towards Alterlife," 120.

These politics are why we call CLEAR an anticolonial lab rather than a decolonial lab. I follow collaborators Tuck and Yang when they argue that "decolonization doesn't have a synonym."[99] They write that decolonization means "repatriating land to sovereign Native tribes and nations, abolition of slavery in its contemporary forms, and the dismantling of the imperial metropole. . . . Decolonization is not equivocal to other anti-colonial struggles."[100] It means other things, too, since there are many colonizations and thus many decolonizations, but my dedication to this meaning comes largely from being an academic, where the verb *decolonize* is frequently invoked as something that you do to university courses, syllabi,[101] panels, and other academic nouns.[102] Yet in the face of all this "decolonization," colonial Land relations remain securely in place. Appropriating terms of Indigenous survivance and resurgence, like decolonization, is colonial. If we've been working together in this text up until now, I hope you can see the relationship of such a promiscuous use of *decolonization* with the definitions of colonialism above: it means settler and colonial access to Indigenous Land, concepts (like decolonization and indigenization), and lifeworlds to advance settler and colonial goals, even if they are benevolent ones. Especially benevolent ones. Probably not what is intended.

99 Tuck and Yang, "Decolonization Is Not a Metaphor," 3.

100 Tuck and Yang, "Decolonization Is Not a Metaphor," 31. There is a tradition where decolonization refers specifically to knowledge, and this tradition comes largely out of Latin America and parts of Africa. While those theories and activisms are crucial to where they come from, so, too, is a definition of colonialism that gives up no ground, here in occupied territory. I do not think that Indigenous theorists from either tradition are interested in the conflation and the erasure and de-placing of our/their respective struggles.

101 Zara, "I don't know who needs to hear this right now . . ."

102 In short, I believe this land-based definition of decolonization matters in spaces where land relations are not already a guiding orientation. There are many spaces where a hard line on definitions of decolonization may not be appropriate, given the diversity of Indigenous groups, colonized groups, and their decolonization efforts. But this is an academic text with mostly academic readers and as such I'll assume a good chunk of white and settler readers (hello!). I have watched Indigenous people doing a diversity of Indigenous science and even decolonial science, and then watched well-intentioned settlers appropriating those terms to describe their own activities and goals over and over and over. While I think academia is increasingly seeking to put land relations at the forefront of critique and theory, we're not good at carrying that commitment into action. So, I start here with the 101 and some edges on the sandbox.

This also means CLEAR, as a lab, does not *claim* to do Indigenous science. Indigenous science refers to science done by and for Indigenous people within Indigenous cosmologies. Botanist Robin Wall Kimmerer's (Potawatomi) *Braiding Sweetgrass*, where she narrates botany through Potawatomi traditions and teachings, is an example of doing Indigenous science in academia.[103] (I believe most Indigenous science is done outside of academia and we will never hear about it.) While some Indigenous members of CLEAR certainly engage in Indigenous science the way Kimmerer does, it isn't available to all lab members nor should it be. Likewise, CLEAR's Indigenous lab membership also engages in decolonization based on diverse understandings and reclamations of Land relations, but this also isn't available to all CLEAR members or to all readers. Indigenous peoples do, use, and refuse Western and Indigenous sciences along a rich spectrum, but CLEAR is not primarily an Indigenous science lab.

As director of CLEAR, I identify our space as an anticolonial lab, where anticolonial methods in science are characterized by how they do not reproduce settler and colonial entitlement to Land and Indigenous cultures, concepts, knowledges (including Traditional Knowledge), and lifeworlds. An anticolonial lab does not foreground settler and colonial goals. There are many ways to do anticolonial science: in addition to Indigenous sciences, there are, for example, also queer, feminist, Afro-futurist, and spiritual land relations that are anticolonial. *Anticolonial* here is meant to describe the diversity of work, positionalities, and obligations that let us "stand with" one another as we pursue good land relations, broadly defined.

Plastics' Specificity

Let's bring the idea of specificity and obligation into plastics. The term *plastic* refers to many types of polymers with many, many associated industrial chemicals. Plastic pollution scientist Chelsea Rochman and colleagues have written about how treating all plastics as one type of thing has led "to simplified studies and protocols that may be inadequate to inform us of the sources and fate of microplastics, as well as their biological and ecological implications."[104] Plastic in the singular misses things that are rather central to plastic activism, plastic science, plastic policy, and other plastic relations. For example, the term *single-use plastics* includes medical plastics, disposable packaging, and other items. Conflating them can cause harm, particularly when there are calls to ban all single-use plas-

103 Kimmerer, *Braiding Sweetgrass*.

104 Rochman et al., "Rethinking Microplastics as a Diverse Contaminant Suite," 703.

tics. The #suckitableism movement and thinker-advocates such as Alice Wong (unmarked) have been very clear that plastic bendy straws are used by people with disabilities to create livable worlds and that bans are ableist.[105] Without differentiating between medical plastics[106] (while also making them less toxic, as Health Care without Harm[107] is advocating) and other single-use plastics, or differentiating between PVC (which is full of toxic chemicals) and silicone (less so),[108] or differentiating between plastic use and plastic production, it is impossible to be responsible to the problems and ethics of plastic pollution (see chapter 2). This is just one way to think about the relationships among differentiation, specificity, ethics, and obligation in plastics.[109] There's not even a We for plastics.[110]

This Text Has Relations and Obligations

This text has specific obligations and relations as well. It was written on Beothuk Land in St. John's in the province of Newfoundland and Labrador: "The relationship between an object and where it belongs is not simply fortuitous, or a matter of causal forces, but it is rather intrinsic or internal, a matter of what that thing actually is."[111] Things like this book. Things like ideas. Place-based

105 Wong, "Rise and Fall of the Plastic Straw."

106 Jody Roberts (unmarked) has written about this issue eloquently in "Reflections of an Unrepentant Plastiphobe": his fear and dislike of plastics confront the medical plastics that keep his daughter alive. His work highlights how ethics and obligation are situated.

107 Health Care without Harm, "Health Care without Harm."

108 This is one of my points in M. Liboiron, "Redefining Pollution and Action."

109 A lot of social science work on plastics aims to denaturalize the social singularity of plastics. Most of this work attends to the minutia of the circulation, representation, re/use, or materiality of plastics in-place. For example, see H. Davis, "Life and Death in the Anthropocene"; H. Davis, "Toxic Progeny"; H. Davis, "Imperceptibility and Accumulation"; De Loughry, "Petromodernity"; De Loughry, "Polymeric Chains and Petrolic Imaginaries"; De Wolff, "Plastic Naturecultures"; De Wolff, "Gyre Plastic"; Gill, *Of Poverty and Plastic*; Hawkins, Potter, and Race, *Plastic Water*; Hawkins, "Performativity of Food Packaging"; Hodges, "Medical Garbage"; Klocker, Mbenna, and Gibson, "From Troublesome Materials to Fluid Technologies"; M. Liboiron, "Redefining Pollution and Action"; M. Liboiron, "Not All Marine Fish Eat Plastics"; Meikle, *American Plastic*; Pathak and Nichter, "Anthropology of Plastics"; Roberts, "Reflections of an Unrepentant Plastiphobe"; Huang, "Ecologies of Entanglement"; Helmreich, "Hokusai's Great Wave"; Gabrys, Hawkins, and Michael, *Accumulation*; Westermann, "When Consumer Citizens Spoke Up"; Wagner-Lawlor, "Poor Theory and the Art of Plastic Pollution in Nigeria"; and Stanes and Gibson, "Materials That Linger."

110 This section is based on a Twitter essay: M. Liboiron, "Good Question . . ."

111 Curry, *Digital Places*, 48.

relations are not properties of things so much as what make things. This text is from this place, and that means it will not always travel well, generalize well, make sense elsewhere (more on this in chapter 3). That's fine.

The province of Newfoundland and Labrador, and particularly the island of Newfoundland, was, and in many ways still is, a British colony that was stocked with Irish migrants to work as fish harvesters. The settler population is what is called "genetically isolated" or a "founder population," a rare condition that means that 98 percent of the settler population is genetically related.[112] Experientially, this means that the local accent is archaic Irish. Work holidays are Irish.[113] The food is Irish with a twist of cod. When the province joined Canada in 1949, the confederation document noted that there were no Indigenous people here and that, therefore, the Indian Act did not apply to the province.[114] This party line persists today despite the fact that the Bureau of Statistics recorded Inuit, Innu, and Mi'kmaq populations both before and after confederation. They were out and about buying bread, catching fish, going to school—but officially not existing.[115] So when I say Newfoundland and Labrador is a colony, I mean that it is characterized by a unique combination of remoteness, infrastructural sparseness, Indigenous erasure,[116] and settler homogeneity that shapes everyday lived experience, politics, and intellectual production.

Also in Newfoundland and Labrador: the Land is loud here, and settlers, Indigenous people (local and come-from-away), and others tend to notice their Land relations. On the west coast, 80 percent of the province's population eats local cod at least once a week,[117] and that percentage increases and the species diversify as you move north into Labrador.[118] When the cod fishery collapsed in 1992 after the introduction of Scientific fisheries management, it suddenly

112 Rahman et al., "Newfoundland Population."

113 St. Patrick's Day is a work holiday for government and university staff.

114 Hanrahan, "Lasting Breach." For the lasting repercussions of this on Indigenous nationhood, particularly for the Qualipu Mi'kmaq, see *The Country*, directed by Phyllis Ellis (Newfoundland, 2018).

115 Indigenous erasure isn't a new trick, nor is it unique to Newfoundland and Labrador. See Hall, "Strategies of Erasure"; Bang et al., "Muskrat Theories"; Barman, "Erasing Indigenous Indigeneity in Vancouver."

116 To expand on this idea, erasure doesn't end with recognition. For discussions of how settler-based modes of recognition can continue to erase Indigenous sovereignty and knowledge, see Coulthard, *Red Skin, White Masks*; and Anonymous Indigenous Authors, "Indigenization Is Indigenous."

117 Lowitt, "Examining Fisheries Contributions."

118 Durkalec, Sheldon, and Bell, "Lake Melville."

and acutely transformed the province.[119] The decline in the caribou population and resulting hunting ban in 2013 have likewise transformed Land and nation-to-nation relations in Labrador.[120] When I write about plastics and science, it is more than a case study: I'm talking about my food, other lab members' food (and often their families' histories and livelihoods), and the food, relatives, and heritage of Indigenous, settler, and other people in the province. I am beholden to all of them—these are my specific obligations as a scientist who works on plastics in wild food webs in Newfoundland and Labrador.

I can't talk about Land in Newfoundland and Labrador if I don't talk about the weather. Weather isn't small talk, as I learned when I first moved here and was trapped in my office when the snow outside reached up to my chest, or when I had to crawl home along the sidewalk in high winds so I wasn't blown into the road, or when ice pellets flying in 100 kilometre-per-hour winds made my face bleed, or that day no one came to work because it was sunny. The cabbies all talk weather and oil prices. They are what shape life here.

These Land relations keep me, and many others here, humble. Humility and modesty are different. Modesty means you don't talk about your accomplishments so that you don't elevate yourself over others. Humility means that you are connected to others, and it is the recognition that you cannot do anything without these many others, from the people watching your dogs, your kids, and your students so you can go to conferences, to the people who ensure that your water pipes and garbage cans and Internet work as intended. Cod, wind, snow, caribou—and plastics—are part of the others that connect people to one another and to Land here in Newfoundland and Labrador.[121]

These specific connections do not travel effortlessly to other places with other relations. This is one of the difficult parts of writing a book that travels more promiscuously[122] than the relations the book comes out of. You can read this tension, for example, in my discussion of the diversity of colonialisms, even

119 Bavington, *Managed Annihilation*.

120 Labrador Research Forum participants, "Caribou and Moose."

121 Sengers, "What I Learned on Change Islands"; Brynjarsdóttir and Sengers, "Ubicomp from the Edge of the North Atlantic."

122 *Promiscuous* is not my term for how written texts circulate willy-nilly. It's Plato's (unmarked). He thought that the written word could wander around and speak to whomever, regardless of whom the words were meant for, and this presented a real danger for love notes and other audience-based ethics. His text is performative of that fact, as he tries to get into the toga of a young man whose lover wrote him a love note that seems to have gotten into the wrong hands. Plato, *Plato's Phaedrus*.

as I often address colonialism as if it is fairly monolithic in most other parts of the book. The same holds for why I insistently differentiate between anticolonialism and decolonization—these insights and treatments come from stakes and contexts in Newfoundland and Labrador specifically and Canada more generally.[123] So, I ask of you, Reader, how do we write and read together with humility, keeping the specificity of relations in mind? How do we recognize that our writing and reading come out of different places, connections, obligations, and even different worldviews, and still write and read together?[124]

I was at an academic meeting when a settler researcher asked me and the Inuk next to me what we thought of Shawn Wilson's (Cree) *Research Is Ceremony*.[125] She patiently waited for our replies before telling us that she really couldn't see herself using it, that it was impractical for her kind of research. She said it wasn't for her. My initial response was that no research is exempt from the obligation of good relations, which is one way to understand what Wilson means by ceremony in research. But then it occurred to me that she was probably right. It wasn't for her. *Research Is Ceremony* is very Cree, by my reading. The relations discussed in it are rooted in Cree law, based on the "expectations

123 The Canadian spellings in the text are a reminder that these words come from somewhere.

124 One of the best methodological frameworks I've seen for reading with humility is Joe Dumit's (unmarked) "How I Read." I believe he wrote it in response to the dude-core practice of tearing texts apart as a dominant form of critical academic reading, particularly in graduate school. He outlines a variety of alternative ways to approach a text. I return to this work regularly to help remind me of the various ethics, aims, and collaborations possible in reading. Thank you, Joe Dumit, for your generosity of thought and social relations, and particularly how those things come together in your academic work. After hearing your talk "Elementary Relations: Bromine in Self, Society and World" in Barcelona, I was so inspired to write about relations that I left the conference early, booked myself into a hotel, and started writing this book on every paper surface I could find (coasters and napkins from the hotel feature prominently in the first draft of this text). Thank you and your co-panelists—Michelle Murphy, Dimitris Papadopoulos, Cori Hayden, and Stefan Helmreich—for that talk. Dumit et al., "Elements Thinking T122.1"; Dumit, "How I Read."

Drawing on Dumit's work, I've written about ethics and relationality in reading: M. Liboiron, "Exchanging."

125 S. Wilson, *Research Is Ceremony*. *Research Is Ceremony* is a foundational English-language text on academy-based Indigenous and decolonizing research methods. Thank you, Shawn Wilson, for being one of the early pathfinders for what a research text can look like if its format follows, as best as it is able, Cree law. To write a book as a letter to your family, writing in a way that makes extractive reading difficult and filling it with stories that are themselves analysis, is a gift in academic innovation. Also, I just found out Alex is your sister! So cool! Smith, *Decolonizing Methodologies*.

and obligations about proper conduct" that come from a particular place.[126] *Research Is Ceremony* is written as a letter to Wilson's sons. If relations are specific, then the methods simply will not work as well for anyone who is not Wilson's son. They might work a little, or even a lot, but relations do not universalize. To assume otherwise is not practicing humility with specificity. I'm pretty sure that's not what the settler researcher meant, but it was instructive nonetheless.

Like *Research Is Ceremony*, *Pollution Is Colonialism* is not written for or to everyone in the same way, or even at all. One of my primary struggles in writing this text is how it obliges me to different worlds and readers simultaneously. I am a scientist well seated in the domain of dominant science, even as I arrived via an academic trajectory in fine arts and media studies. I am also an STS-er, an anticolonial activist, and a scooped[127] and slowly reconnecting Métis/Michif.[128]

This text has been crafted and reviewed from similarly incommensurate standpoints. It has gone through academic peer review, first with brilliant friends and then with generous anonymous reviewers.[129] It has gone through

126 Borrows, *Canada's Indigenous Constitution*.

127 Kimmelman, "No Quiet Place."

128 A primer on terms! Because terminology stems from settler government legislation as well as the self-determination of Indigenous groups, terms are always shifting. Different terms are used at different historical moments, in different places, and by different groups and governments. At this time, *Indigenous* is a term used by the United Nations to mean all first peoples around the world. It's also a common term in academia, though often not in communities. It is not a perfect term, but it is the term that applies to the broadest number of peoples and is legible to the broadest number of researchers at this moment. It's the term I use in this text for this reason. In the next book, that might change.

Aboriginal is a term that comes from Canada's 1982 Constitution (section 35), and it refers to all First Nation, Métis, and Inuit groups in Canada. This does not mean, however, that it is embraced by all groups.

First Nations refers only to groups included within Canada's Indian Act (1876) and does not include Métis or Inuit.

For an overview of this terminology in Canada, see Vowel, *Indigenous Writes*.

For more on the complexities of *Métis* as a term whose racial formations we are constantly fighting, particularly in Atlantic Canada where the term has been racialized and appropriated in different ways, see Andersen, *Métis*. For these reasons, here in Atlantic Canada I use the term *Michif*. Thank you, Chris Andersen (Métis/Michif), for your book and for your comradery, generosity, and jokes that kept me planted in a shared space even when we're geographically far apart. Maarsi.

129 Dear anonymous reviewers: Thank you for your time, your labour, your generosity, your work to make this book work better. Duke University Press helped ensure that different reviewers came from different readerships, and your insights helped me see how different

Elder review to ensure the text did not stray from good relations, both in terms of speaking truth to shared Indigenous laws, values, and knowledge, and not overstepping what could be shared. Scientists and anticolonialists, Elders and peer reviewers do not necessarily agree on what is true and right and good. These positions are incommensurate: they do not share a measure of value. This text is beholden to all of them, to its readers, to its place, and thus to multiple incommensurabilities.[130] In "Decolonization Is Not a Metaphor," Tuck and Yang write that "an ethic of incommensurability . . . recognizes what is distinct"[131] and what cannot be joined or conflated. It "brings these areas into conversation, without papering over the differences, but also without maintaining false dichotomies."[132] In this book, there are moments when different kinds of readers are called out, called in, and called down to the footnotes. There are moments that might appear contradictory, at odds, or mutually exclusive because they are.

As collaborators Alison Jones and Kuni Jenkins (white/settler/Pakeha and Maori/Ngati Porou) have written:

> Research in any colonized setting is a struggle between interests, and between ways of knowing and ways of resisting, and we attempt to create a research and writing relationship based on that tension, not on its era-

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audiences need different things in a text and how I might balance those differences and inclusions. Thank you.

130 Science historian Thomas Kuhn (unmarked) talks about the "incommensurability of competing paradigms. In a sense that I am unable to explicate further, the proponents of competing paradigms practice their trades in different worlds. . . . Practicing in different worlds, the two groups of scientists see different things when they look from the same point in the same direction. Again, that is not to say that they can see anything they please. Both are looking at the world, and what they look at has not changed. But in some areas they see different things, and they see them in different relations one to the other. That is why a law that cannot even be demonstrated to one group of scientists may occasionally seem intuitively obvious to another. Equally, it is why, before they can hope to communicate fully, one group or the other must experience the conversion that we have been calling a paradigm shift. Just because it is a transition between incommensurables, the transition between competing paradigms cannot be made a step at a time, forced by logic and neutral experience. Like the gestalt switch, it must occur all at once (though not necessarily in an instant) or not at all. How, then, are scientists brought to make this transposition? Part of the answer is that they are very often not." This book is written from different worlds, if you will, and has these same issues. Kuhn, *Structure of Scientific Revolutions*, 150.

131 Tuck and Yang, "Decolonization Is Not a Metaphor," 28.

132 Tuck and Yang, "Decolonization Is Not a Metaphor," 5.

> sure. Indeed, we seek to extend the tension, and examine its possibilities. In doing this, we cautiously reject the usual suggestion that indigenous-coloniser/settler research relationship should be based in "mutual sharing," or "understanding," or even collaboration when understood in such terms. These injunctions can be understood as calling on certain postures of empathetic relating which aim at dissolving, softening or erasing the hyphen, seen as a barrier to cross-cultural engagement and collaboration.[133]

Often this ethic of incommensurability "limit[s] what we feel free to say, expand[s] our minds and constrict[s] our mouths . . . within the negotiated relations of whose story is being told, why, to whom, with what interpretation, and whose story is being shadowed, why, for whom, and with what consequence."[134]

For this reason, there are many things not said in this text. First, you'll notice the book is about colonial systems of science and pollution, not about the ways Indigenous peoples are disproportionately harmed by pollution. Following Audra Simpson (Mohawk), "I refused then, and still do now, to tell the internal story of their struggle. But I consent to telling the story of their constraint."[135] Along with Eve Tuck, I refuse to reproduce "damage-centered research . . . that operates, even benevolently, from a theory of change that establishes harm or injury in order to achieve reparation" and instead work to put "the context of racism and colonization" at the centre of pollution research.[136] I follow the call to focus on colonialism, rather than its effects, sounded by Aileen Moreton-Robinson and others when they call for research to move Indigenous studies "beyond identity concerns to develop and expand its mode of inquiry to a range of intellectual projects that 'structure inquiry around the logics of race, colonialism, capitalism, gender and sexuality.'"[137] I'm following many people who have elevated refusal into a practice of affirmation, repair, and resurgence, looking upstream to see structures of violence rather than effects and harm.

These methodological strategies and negotiations are usually written about as methods for researchers and writers, but I would ask that *readers* take them up as well.[138] If at some point, as you read, you think "this isn't for me, I can't take this up," you may be right, but that response does not foreclose the invitation

133 Jones and Jenkins, "Rethinking Collaboration," 475.
134 Fine, "Working the Hyphens," 72.
135 A. Simpson, "Consent's Revenge," 328.
136 Tuck, "Suspending Damage," 413, 415.
137 Moreton-Robinson, *White Possessive*, xvii.
138 M. Liboiron, "Exchanging."

to keep reading. It is an occasion to ask what is happening between[139] yourself and the text. Reading ethically can mean refusing to read as a form of extraction, though academia has trained us to do so. Tuck has written:

> To watch the white settlers sift through our work as they ask, "isn't there more for me here? Isn't there more for me to get out of this?" . . .
>
> Isn't there something less theoretical? Something more theoretical? Something more practical? Something less radical? More possible?
>
> Can't you make something that imagines it clearly enough for me to see it? For me to just plunk it into my own imagination?
>
> Can't you do more work for me? because I have given this five whole minutes of thought and I don't see the future like you. . . .
>
> I'll just keep sifting through all of this work that was never meant for me, sorting it by what is useful to me and what is discardable. . . .
>
> I forgot that people read extractively, for discovery[.]
>
> I forgot that all these years of relation between settler and Indigenous people set up settlers to be terrible readers of Indigenous work.[140]

The first time I read this thread it shocked me into reflexivity because, while I try to stay in good relations, I often—usually—read extractively, looking for bits I can use. I had been reading in a Resource relation (see chapter 1) that is unidirectional, assessing texts solely for my own goals and not approaching them as bodies of work, events, gifts, teachers, letters, or any number of other ways that would make unidirectional, extractive relations seem rude and out of place.

As a writer, I have tried to write less extractively by citing at length, footnoting my relations to texts, leaving things out, and spending considerable time on certain concepts to balance obligations to different audiences and knowledge systems. I've also tried to support readers in reading less extractively by addressing the reader explicitly, using jokes to make space for difficult concepts, being clear that this is a text written out of the province of Newfoundland and Labrador, and signaling how not all ideas travel effortlessly and easily root in other places. You don't need a lab like CLEAR to attune everyday intellectual practices to anticolonialism. Writing and reading are relations. We have already started.

139 Fine, "Working the Hyphens."

140 Tuck, "To Watch the White Settlers . . ."

A Road Map

This is a methodological text, where methodology is understood as a way of being in the world. An ethic, if you like that word better. There are colonial ways to be in the world, whether intentionally or otherwise, and there are less colonial and anticolonial ways to be in the world. This includes science. Throughout this book, I redefine pollution as central to, rather than a by-product of, colonialism, and I think about the role of science in achieving both colonialism and anticolonialism. I use plastics and their status as a pollutant to investigate and then refute those colonial relations. Often, I'll turn to CLEAR as the lens and framework to denaturalize colonial scientific practices and concepts of land, Nature, and Resource, while also giving examples of anticolonial science and methodologies that produce diverse futures. As such, this text is less about claims and more about models. I hope the text is useful to you. But not in a creepy, Resource-y way.

The first chapter, "Land, Nature, Resource, Property," outlines the historical and conceptual groundwork for the invention of modern environmental pollution as a colonial achievement. It discusses Indigenous concepts of Land and how these ideas get flattened into Nature through colonial relations based in separation, universalism, and the scientifically proven resilience of the natural world. Building on these concepts, I theorize Resource relations, by which I mean the morality of maximum use of Resources, dispossession, and property as a way to control both time and space to secure settler and colonial futures. This mode of Resource relations is a hallmark of colonialism. Two story lines animate this discussion. The first is the story of Streeter and Phelps's pioneering[141] work on assimilative capacity that defined the moment of pollution as that when bodies of water could no longer assimilate pollution. Everything else was mere contamination. A second story interrupts the first with short vignettes from CLEAR, as lab members grapple with legacies of colonial science as well as events, practices, relations, and landscapes that refuse logics of colonial relations.

The second chapter, "Scale, Harm, Violence, Land," builds out plastics as more than a monolithic pollutant that must be banned or eradicated, not as a theoretical exercise, but for the purpose of working with plastics in science and activism. I theorize scale as a way to understand specific relationalities, differ-

141 "OMG. Why do you flag *pioneer* every time? We get it. It's a dirty word." I flag it because dirty words are not to be left unattended. That's how they get laundered and normalized. Bad *pioneer*.

ences between harm and violence, and recourses to purity in environmental activism and dominant science. I recount how settler endocrinologists, conservationists, and toxicologists come to understand plastics and their chemicals in complex ways that open up dominant science as a practice already rife with examples of and impulses to anticolonial work, troubling the division of Nature from humans, the autonomy and discreteness of both matter and agency, and universalism. The chapter closes with examples from Indigenous thinking about plastics as Land to extend anticolonial framings of plastics' diverse L/land relations (please fully read that part of the chapter if you just started salivating at the phrase "plastics as Land").

The third and final chapter, "An Anticolonial Pollution Science," lays out the *how* of CLEAR's anticolonial science via our methods. I use the examples of CLEAR's unique practices of peer review and sampling to return to concepts of specificity and obligation. I introduce the framework of compromise to describe some ways to ethically maneuver the uneven power relations of dominant and anticolonial science. It ends with final thoughts on how to stay true to critiques of universalism while also generalizing the lessons of the text into what I imagine to be the Reader's own work—How do place-based, nonuniversal methods travel? How do we take messages with us without being extractive or Resource-oriented? How do they become useful and good in other places, for other people, like you? I look forward to the stories you tell[142] when you stand on CLEAR's shoulders. You might think of this final chapter as dessert. Sometimes I eat dessert first. But the book as a whole ensures that the last chapter is not just delicious but not-very-nutritious sugar. Together, the chapters build up the nuances, stakes, and methodological legacies that ground CLEAR's work.

This is a book about work. Really hard work. I'm always glad when people raise a fist against the injustices of systems, including pollution and its sciences. But I'd much prefer people pick up a shovel—or a microscope—with the other hand and get to work. *Pollution Is Colonialism* is designed to show how scientists and others are already working in an anticolonial way. We always already are in L/land relations, and they come out in our methods. Time to start.

142 And cite! One of the issues we face in CLEAR regularly that I'll bring up again in chapter 3 is being thanked for our work and how it helps others in their own research, but our intellectual production is not cited. Please follow basic academic manners and cite methods I am sharing, which have been proposed, tested, tweaked, validated, and laid out here after peer review. Thank you.

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