Learning computer science was hard. Unlearning computer science is harder.

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December 2019

A thesis submitted to McGill University in partial fulfillment of the requirements of the
degree of Masters of Arts

Abstract

In order to succeed in a computer science (CS) education, CS students must learn how to translate reality into code, algorithms and other computational knowledges and practices. Samantha Breslin refers to these processes and practices as "rendering technical," a term which also encompasses how computational processess and practices shape reality in material and conceptual ways. Technical renderings create computational 'worlds' that enable computer scientists and CS students to frame their world in terms of problems and solutions that are computationally solvable. However, this is possible only by reducing or omitting the social, cultural, political, economic and historical aspects of reality. And once CS students learn how to render technical it becomes very difficult to think in ways that honour the full complexity of reality.

This thesis is an autoethnography of some of my experiences in learning to think around the boundaries constructed by processes of rendering technical. My narrative revolves around a workshop/political intervention I organized and facilitated with/for friends and colleagues in tech to begin a conversation about the social and political challenges facing us as technologists. The workshop was a step in my journey from an uncritical CS student, to a computer programmer and computer programming educator becoming increasingly skeptical of Silicon Valley dogma, to a graduate student wishing to commit and contribute to the difficult and non-innocent work of undoing the social hierarchies and the interlocking oppressions produced by the relations of settler colonialism.

Thick descriptions of the path I have walked, and of my experiences trying to invite other technologists to learn from and contribute to my learning, can offer insights for academic and activist educators interested in education for social change.

Resumé

Pour réussir en sciences informatiques, les étudiants doivent apprendre à traduire la réalité en langage informatique, algorithmes et autres pratiques et conventions informatiques. Samantha Breslin desgine ces procédés et pratiques le "rendu technique," un terme qui décrit comment ces procédés et pratiques informatiques façonnent aussi bien la réalité physique que conceptuelle. Ces rendus techniques générent des 'mondes' virtuels qui permettent aux étudiants d'apprehender leur environment en termes de problèmes technologiquement solvables. Toutefois, ceci n'est possible qu'à condition d'omettre les réalités sociales, culturelles, politiques, économiques et historiques de la réalité. Et a compter du moment ou les étuidants s'approprient le concept de "rendu technique" il leur devient tout de suite très difficile d'apprehender toute la complexité de la réalité.

Cette thèse est une autoethnographie de certaines de mes expériences pour penser les limites construites par les procédés de "rendu technique." Mon récit s'articule autour d'un atelier/intervention politique que j'ai organisé avec/pour des collègues et amis dans l'industrie de la technologie pour amorcer une conversation sur les défis sociaux et politiques que nous avons a relever en tant que technologues. L'atelier a été une étape dans mon parcours d'élève en informatique, depourvu d'esprit critique, à un programmeur et éducateur en programmation devenant de plus en plus sceptique au dogme de la Silicon Valley, et enfin en tant qu'étudiant diplômé souhaitant s'engager et contribuer a la tâche difficile et politiquement intéressée de défaire les hiérarchies sociales et les oppressions produites par des rapports de colonialisme.

Ces descriptions denses et détaillées du chemin que j'ai parcouru, et de mes invitations faites aux autres technologues à apprendre et contribuer, auront je l'espére le potentiel d'inspirer académiciens et autres éducateurs/activistes intéressés par l'enseignement du changement social.

Acknowledgments

First of all, I would like to thank all the participants of the workshop which frames this thesis and which has inspired my work more generally. I am indescribably grateful to all of you for sharing your experiences with one another, for learning together and contributing to all our our collective learning, for allowing me to learn from you, for keeping me accountable, and for encouraging me that the work I have begun is important and needed in the tech industry (and beyond).

Thank you also to those who helped me organize and facilitate the workshop itself, and to those who provided invaluable feedback on earlier drafts of this thesis. Your contributions have made this work so much stronger than I could have ever made it on my own.

I cannot express how thankful I am to Elizabeth Patitsas. She played my thesis supervisor in one of her roles, but was and continues to be so much more. Her broad, detailed and critical knowledge of academia helped me not only navigate through my degree, but also to claim the space I needed to care for myself in a process that would otherwise have squeezed all the energy out of me. Helpful also was the funding she secured for me, which allowed me to focus on my learning. Our conversations, the readings she assigned me, the reading groups she intitated and encouraged me to participate in, and the classes she taught that I was welcomed to audit, gave me the solid foundation I needed to complete my work at McGill, but also to more critically understand myself and the world beyond the walls of the university. And it was her guidance that made the first drafts of this thesis possible, her keen observation that pulled a coherent and compelling story out of those early drafts, and her continuous feedback, encouragement and trust that helped me polish them into what you're reading now.

Yet as important as all that was, I am most grateful to Elizabeth for pushing me to learn like no other teacher ever has. Her care and empathy allowed me to bring my full self into my learning; her trust and patience allowed me to learn at my own pace and from my own mistakes; and the supportive ways she challenged me on my unknowns, on my unstated assumptions, and on my particular privileges, helped me do the best work I can do. Elizabeth modelled teaching for me in ways I hope to also one day be able to model for my own students, and for this too I am immensely grateful.

I would also like to thank my professors at McGill University for their contributions to my learning, with a special shout-out to Aziz Choudry, Naomi Nichols and Philip S.S. Howard. I have all three to thank for helping me learn to notice the ways liberal thinking structures much of the world we move through, especially the ways it informed my own perspectives, and to appreciate the need and urgency of more critical and more radical ways of thinking and being in the world. And perhaps more importantly, they showed me that it's possible to be

The work I have done throughout my time at McGill is not separate from my 'previous' life, and so I would also like to thank everyone who has been a part of my life, or who remains one. I am lucky and deeply grateful for your presence in my life. To my friends and family I would like to extend a special gratitude for the conversations that have shaped and contributed to my work, for your care, your patience and your understanding as I have struggled with the implications my work have inspired for my life more generally, and for your love, which continues to sustain me.

My mother and father, Elena and Gelu, I thank for giving me the life and the opportunities I enjoy today, for teaching me about responsibility and generosity, and for their unconditional love and unwavering support in all that I do. My brother, Cristi, I thank for being my first friend and for laughing with me when I need it most.

Finally, I would like to thank my partner, Nastia. Much of what I have learned the last few years I learned in conversation with her. I am grateful for her patience in working with me through difficult theoretical issues, for her invaluable insights, for the ways she challenges me and holds me accountable to the responsibilities all that learning have made me aware of, and for always being there for me, whether what I needed the most was a listening ear, a shoulder to cry on, or a kick in the butt.

Contents

Waiting for the bus, I wasn't sure I'd be able to hold my breakfast.

The two friends waiting with me were also coming to the workshop, but they showed no signs of being nervous. I knew they were coming not only because they were interested in the workshop itself, but also because they wanted to support me. That was clear, as less than half an hour earlier, when I stood up from the counter at my parents' house where we were having breakast, and went to sit on the couch to breathe, they asked me if I was nervous. Yes, I told them, and so they encouraged me, but I don't remember the words they spoke. They probably told me I was well-prepared, which I was. Or that I was gonna be alright, even if my worst fears about the workshop came true. They were right about that too. But they were also wrong.

I told them I was nervous but not that I was overcome by a nauseating lightness. That it felt as if there was some trick to keeping my feet on the ground, that it suddenly escaped me, that if I didn't remember it soon, down would become up and up down, and that nothing would stop me from falling into the universe. My heart beat so fast I thought it might escape my ribs. But I had felt this intense anxiety before, and knew that with a little effort I could make it pass.

I took a few long, deep breaths.

In...

...then out.

In...

...then out, slowly, like that.

Down stayed down. I went back to my plate and finished breakfast. The anxiety, lessened now and therefore manageable, was still there. I thought about the fear of freedom Freire wrote about, and wondered, was I in its grips? Asking myself that reassurred me, because if that's what I was dealing with, it meant I was on the right path. I focused on that thought as I gathered the materials I had prepared for the workshop and walked to the bus stop with my friends. And when the bus finally arrived, and the three of us boarded and found a bench to share, and the bus took off with a jolt my stomach wanted to protest, I hung on to that fear of freedom because it reminded me that there was nothing I wanted to do more that day than to facilitate the workshop.

Chapter 1: About this autoethnography

Have you ever abandoned a book because you started with a 'Preface' or an 'Introduction' you couldn't get through? You know, those first few pages often numbered with tiny roman numerals, sometimes written many years after the book was first published, or even by a different author? I struggled through many of those dense little chapters, probably because when I learned to read, I was taught that you start a book at the cover and you keep on flipping pages until there are none. If you're a completionist, maybe this is already the 10th consecutive page you've read in full – that's OK, it's how I used to do all academic literature, too.

My thesis supervisor, Elizabeth Patitsas, whose gently challenging influence wanders through all of the best pages that follow, started teaching me how to read like an academic from our very first meetings. She must have known it was going to be difficult and that it's better to start right away; it really was, and honestly, I still can't do it well. But one thing I have learned is that well-structured academic work helps a reader move through it as painlessly as possible. A well-written chapter or section, when paired with a descriptive name, can tell a reader whether they should take the time to read it, whether they can skim it, or whether they can skip it altogether.

If you're not an academic, here's a hint about the chapter you're reading now: the introduction to an MA thesis is usually expected to summarize the research it's reporting on, and in particular the specific scholarly contributions the author is making to the research literature. (That last part is one of the main things I'm being evaluated on in this whole thesis writing exercise). I've tried to do that in a way that will keep you interested. But when you're summarizing something complex, you necessarily lose the detail that can be the difference between learning something new and gulping down word soup. Which means this chapter is denser than how I've tried to write the others, and I won't be at all offended if you've heard enough and just wanna skip ahead to the next chapter. But if you're a completionist, that's fine too, you're welcome here.

1.1 This thesis is a story

This thesis tells a story that started, unknowingly, the day I walked into my first computer science class at university, and began learning to think in ways particular to computer scientists. That way of thinking and being in the world is at the core of what Samantha Breslin identifies as processes of "rendering technical," processes that enable computer scientists to frame reality in terms of problems and solutions that are computationally solvable.[1] Rendering technical is only possible, however, if the social, cultural, political, economic and historical

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1. Breslin, "Making of Computer Scientists," 5.

aspects of reality are omitted from consideration, or at least significantly and problematically reduced so that they can be conceptualized in technical terms.[2] And I'm finding, like Breslin does too, that once someone becomes fluent in rendering technical, these reductions and omissions build mental barriers that are very difficult to think and work around.[3]

What you're now reading is an autoethnography of some of my experiences of learning to think around these boundaries. Autoethnographies are ethnographic studies of the self, that is, observations of one's thoughts, feelings, beliefs and actions that are investigated together with social theory. My narrative self-study revolves around a January 2019 workshop I organized and facilitated with and for friends and colleagues in tech – and their friends and colleagues – to begin a conversation about the social and political challenges facing us as technologists. The workshop was a deliberately political step in my journey from an uncritical computer science student, to a computer programmer and computer programming educator becoming increasingly skeptical of Silicon Valley dogma, to a graduate student wishing to commit and contribute to the difficult and non-innocent work of undoing the social hierarchies and the interlocking oppressions produced by the relations of settler colonialism.

In my story I lean most heavily on the languages of rendering technical and of settler-colonial theory to investigate myself. These are languages I have only recently began to familiarize myself with, and indeed, much of the story that follows is about how I have struggled (and continue struggling) to learn them, and especially to infuse their insights into my day-to-day life. As is common with critical literature, I have therefore tried to be transparent throughout about how learning and self-reflection are not linear but iterative processes, and that they have been (and are) greatly shaped by my relationships with colleagues, professors, community members, family, and friends. In other words, I have tried to tell my story without pretending like I always knew what I tentatively know now (a practice that is worryingly common in graduate theses), and I have tried to deliberately avoid creating illusions of objectivity by avoiding what Lucy Suchman calls the "view from nowhere."[4]

This deeply personal narrative is therefore necessarily partial. It is very much my own, and it is incomplete, as the struggles it tells of are ongoing. Both the lived aspects of the story and its telling belong to a larger effort not to separate myself from the histories that came before me, not to avert my eyes and mind from the injustices caused by my presence in this world. To borrow the words of Sherene Razack, this thesis is part of a continous effort of "unlearning [myself] as modern and coming to understand [myself] as responsible."[5]

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2. Breslin, "Making of Computer Scientists," 8-9.
3. Breslin, "Making of Computer Scientists," 139-142.
4. Suchman, "Working Relations of Technology."
5. Razack, "Race Thinking," 21.

1.2   Who this thesis is (primarily) for

As chapter 8 discusses in more detail, I've tried to write this thesis first and foremost for other technologists such as those that attended the workshop I organized. My hope is that it contributes to ongoing conversations about technology and our responsibilities as users and creators of it. I offer my story therefore not as a definitive statement, but rather as an invitation into dialogue.

I believe this thesis can also be useful to academics and activists interested in education for social change. My thick descriptions of moments along the path I have walked from a liberal-minded computer science student, to someone struggling to become responsible as a white settler implicated in the violences of settler colonialism, and in particular my experiences trying to invite others to learn from and contribute to my learning, can offer insights for educators wishing to do something similar with and for their own students.

1.3   Exercise

Throughout this thesis, I end all chapters with an exercise. These are opportunities for you to take some time to sit and think about the content of each chapter and to apply what you're reading to your own life. Arnold and his colleagues have learned that a transformational education requires a circular learning process, where reflection is embedded in everything we do.[6] A static written document like this thesis is far from my ideal educational environment (hence why I organized a workshop); but as I write a little bit more about in chapter 7, I found that even a document such as this one can be a catalyst for reflection and dialogue. I hope the exercises here will therefore encourage a more active engagement with what you're reading, and that they will push your learning beyond these pages and into your own communities.

Because I have written this thesis primarily for technologists such as the workshop participants, I have written these exercises first of all for computer science students, programmers, designers, systems administrators, or any others studying or working in or adjacent to technical fields. However, I expect that only three of the exercises will be difficult to do if you are not working in or studying technology – the one in this chapter, and the ones in chapters 2 and 8. While some of the others also focus on technology, they don't focus specifically on studying or creating tech and I believe most other readers will find them valuable too.

The exercises also ask that you write the answers down, or talk about them with a friend. Some people suggest that writing helps you think in a way speaking doesn't and leads to insights you would otherwise have missed. Personally, I find I learn the most in conversations with others. As I expand on in further chapters, the collective intelligence of multiple people in dialogue also leads to insights I would personally have missed were I to think and reflect on my own. Your most honest self knows better than I do what helps you get the most out of

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6. Arnold et al., *Educating for a Change*, 47.

exercises like the ones in this thesis, so as a quick warm-up to this first exercise, think about how you best learn and keep that in mind as you go through the rest of the exercises here.

Then, take a few minutes to think about each of the following questions and prompts. And again, if it helps you, write your answers down or have a conversation about them with a friend.

1. How did you feel when you started learning about computer science? How did those feelings change over time?

2. Why did you start learning about computer science? What were your goals?

3. Did you succeed at those goals? Why or why not? Have your goals changed since you started learning about computer science?

Chapter 2: Breaking the spell of Silicon Valley

In 2006 I walked into my first computer science class at Simon Fraser University. That was a few months before Steve Jobs announced the first iPhone, but among my classmates and soon-to-be friends, the belief that digital mobile technology was going to change the world – and *for the better* – was already sacred. Notions of boundless progress brought on by the likes of us – hackers, coders, (mostly) young and middle-class men with passions for computing – filled our thoughts and conversations unproblematically; that is, they were unquestioned and taken for granted. I felt destined for the heroic life(style) of the tech entrepreneur, who finds not only wealth and prestige through code, but also a deep sense of purpose, of fulfillment.

Disillusionment with that technocratic dogma set in slowly over the last years of my undergrad degree. The more I learned about computer science, the less I was ready to believe it truly was capable of solving the world's problems. Shortly before graduating, a job placement for a dull and lifeless Software MegaCorp further peeled some of the Silicon Valley veneer off my earlier fantasies of certain tech success. And the allure of coding as a dream job betrayed itself for a bait-and-switch scheme while on my second job as a developer in the summer of 2014, this time for a rapidly-growing start-up. That summer I clocked a lot of unpaid overtime, which the company's CEO indirectly justified by insisting that the online shopping 'experiences' we were creating were actually a gift to humanity. That unpaid labour was a labour of love, he argued by implication; we should be proud of the five, ten, sometimes even twenty extra hours we devoted each week to the 'happiness' of online consumers.

It was no accident that I became enchanted with tech seemingly overnight, and that it then took years to break free of its spell. In a study of how computer science (CS) students become computer scientists, Samantha Breslin found that CS education represents reality in ways that enable it to be managed and manipulated by computation – or, in other words, by those with skills and knowledge of computation. CS education, in her words, "initiates" students into a community endowed with "the 'mystical power' of programming and computer science abstraction," turning them into computer programmers and scientists that often understand themselves as "wizards proficient in the power and magic of programming."[1] And this starts the moment they walk into a CS classroom.

2.1   Rendering the world technical

In my first CS class, I was taught that the most important part of becoming a successful computer scientist was to learn to think like one. Whether I wanted to pursue theoretical studies in CS or learn practical skills like programming, learning to *think* like a computer scientist – sometimes also referred to as 'algorithmic' or 'computational' thinking, or even as 'thinking

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1. Breslin, "Making of Computer Scientists," 132-139.

like a computer'[2] – was the most urgent, and difficult, task. The early years of my CS degree were thus heavily focused on teaching me the rules by which computers operate, and the ways in which I had to understand real-world problems so that they can be solved computationally.

Breslin refers to this work of translating reality into code, algorithms and other computational knowledges and practices as "rendering technical." The translational work of these technical renderings, however, in turn also shape reality itself, both materially and how it's understood.[3] Her research shows that these renderings create computational 'worlds' with closed and consistent internal logics that can only be partial representations of a much more complex, messy and in many ways even unknowable reality.[4]

At the Singaporean university where she conducted her research, Breslin noted that when students learn the difficult programming language 'C', the focus is solely on the language's *technical* aspects. Missing are the social, historical and political contexts within which C was developed and that played major roles in its particular quirks and the challenges they present to programmers. As a consequence, she argues, students learn to accept the language's rules as given and fixed, and as knowledge to master but not question. The conception of the rules as immutable and indisputable is further reinforced by technical tools like compilers and integrated development environments which solidify a particular moment in complex historical, social, cultural, political *and* technical relations into something that is seen as *only or purely* technical.[5]

A similar thing happens when CS students learn how to translate reality into bits of information, abstract data structures and other constructs that can be manipulated algorithmically. Often, the very first thing a CS student learns is that computers are not capable of making inferences or reading between the lines. In order for them to be useful, therefore, all applications of computers must be explicitly defined – only this makes computation possible. A product of this process is that both problems and solutions are defined in technical terms, making them solvable through technical means by their simplification. It's through such processes of rendering technical, then, that computer scientists come to understand themselves as uniquely capable of solving the world's problems.[6]

A hackathon project I once saw being demonstrated to much enthusiasm was marketed as 'solving' problems related to air pollution.[7] An app was built that made government air quality data available to smartphone users in an accessible way so as to help them decide which parts of town to avoid on a particular day, or whether they should avoid the outdoors altogether when it's especially hazy. The app's developers thus framed the problem of air pollution as one of smartphone users not having easy access to air quality information. Missing from

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2. For a history of these kinds of thinking, see Tedre and Sutinen, "Three Traditions of Computing."

3. Breslin, "Making of Computer Scientists," 5.

4. Breslin, "Making of Computer Scientists," 94.

5. Breslin, "Making of Computer Scientists," 117.

6. Breslin, "Making of Computer Scientists," 110.

7. Breslin cites a similar haze-related hackathon app in her work, and her analysis is what helped me analyze my own experience. See Breslin, "Making of Computer Scientists," 110.

the problem description were the social, political and economic factors that contribute to air pollution, as well as any questions of who has access to an internet-connected smartphone or who may not have the option of staying indoors to avoid haze. These considerations were thus obscured as air pollution was reduced exclusively to measurable and computable data such as GPS coordinates or the concentration of pollutants in the air.

Of course, it's possible to imagine an alternative app that might directly contribute to anti-pollution projects. If it were designed, for instance, to connect air pollution data to the industries and corporations that produce it, to the laws and economic policies that make pollution profitable, or to the social and historical reasons why some neighbourhoods enjoy clean air and others don't, then such data could help raise consciousness or spark action against polluters. Unfortunately, when computer science education trains students to render technical, all that context is magically made to disappear – what we're then left with are just the data and the apps.

2.2 Breaking free of the spell

When I watched the demo of the air-quality mapping app in 2019, I was already in the process of writing this thesis. My supervisor had just recently introduced me to Samantha Breslin's work, and while the concept of rendering technical was new to me, it gave me the language to speak, to write, and to think about – in a more precise and detailed way – something I had become increasingly aware of since the summer of 2014 when I worked overtime for the e-commerce start-up.

Also in summer 2014 were the Isla Vista shooting, #Gamergate and the vilification of Julie Ann Horvath who was attacked on social media for drawing (urgent) attention to a culture of harassment at tech darling GitHub. These events horrified and deeply disturbed me, foremost for their vicious and violent misogyny, but also for the ways they were undeniably connected to tech. The Isla Vista shooter had belonged to, and became revered within, online communities like reddit[8] – a community that just a few years earlier I had felt strongly attached to myself. #Gamergate was a misogynist hate campaign that began online but quickly, and terrifyingly – especially for the women being attacked – spilled into the offline world. A group of gamers, most of them men, were upset that women and those they dubbed 'Social Justice Warriors' – that is, anyone who dared to take social justice seriously in their engagements with games (or life) – were spoiling their fun. Their coordinated and vicious online attacks led to death and rape threats that forced several women to flee their homes and go into hiding.[9] And GitHub was not only a tool I used every day as a coder, but also a brand, one that carried serious 'cred' in the tech start-up scene. Horvath's allegations of bullying and harassment at

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8. See, for instance, Hauser, "Reddit Bans Group."

9. For an overview of #Gamergate until mid-October 2014, see Dockterman, "What Is #GamerGate"; and Dewey, "Guide to Gamergate"; for a take on how #Gamergate might fit into the rise of the so-called 'Alt-Right,' see Beran, "4chan."

the company, and the mob-like misogynist attacks on her character that she experienced after going public, cast a dubious shadow on the industry I worked in.[10]

It was impossible for me to disconnect these events from tech, and especially also from the work I did or from myself. Following their developments online, and in particular reading feminist analyses of what was really going on, was the first time I can clearly remember beginning to see and think around the artificial boundaries that would separate tech – its practices, its products, its people – from the world that contained them all. And I began not only to doubt that technology is necessarily progressive, as the process of rendering technical had led me to believe, but also to wonder whether technology may even in fact be harmful.

Is it ethical to build software if its existence relies on exploited labour in foreign factories, or if it increases consumption and contributes to the destruction of the environment? Is the go-to business model of tech startups anti-democratic when it trades free online services in exchange for personal information, to be sold to advertisers or handed over to intelligence agencies? Could GitHub be only the tip of the (melting) iceberg? Might also the culture at the company I work for be hostile to women and under-represented groups in tech? And might I be too?

Questions such as these began to occupy more and more of my thoughts and my time. But unlike the technical puzzles I was solving at work, I didn't even know how to begin addressing them. They were too complex, too big, full of too many unknowns. All I had to work with was a feeling that the education I had received, from elementary school to university, did little to prepare me for such questions. I thought, then, that what I was missing, that what we were all missing, was an education more focused on questions like these.

I soon quit programming computers in order to teach how to do it instead, in part as a step towards finding a kind of education capable of making the world a better place. But while I had began to doubt the potential for tech to change the world for the better, I still carried in my identity the conviction of my ability to *personally* make that difference. A lifetime of opportunity and privilege certainly contributed to these feelings of saviourism,[11] but probably so did the CS education, which, even away from the computer, had me looking at the world as made up of solvable problems.

Breslin's research suggests that as computational and computable worlds are separated from the historical, social, cultural and political contexts that make them possible, technical renderings become natural. For CS students, this means that as computationally-oriented conceptualizations of the world become increasingly natural *to them*, they often begin to understand them as *actually* natural. In other words, they mistakenly come to believe that "reality was always mathematical, categorical, and computational – as if the computational universe and the actual universe are one and the same."[12] By learning computer science, that is by learning to render the real world into technical terms so that it can be acted upon computationally,

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10. See Wu, "GitHub's Unconvincing Investigation."

11. In the next chapter, I begin to look more closely at what social and historical forces privilege me and factor(ed) into imagining myself as someone who can save the world.

12. Breslin, "Making of Computer Scientists," 130.

Breslin argues that CS students are therefore initiated into an understanding of the computer scientist as uniquely capable of shaping the world and building the future.[13]

I certainly saw myself that way as well, and as worldviews and ways of thinking are difficult to change, I sometimes still catch myself with an inflated sense of agency. Nevertheless, once I became a CS educator myself, it didn't take long for me to discover how incapable a technical education is of addressing the questions that really bothered me. So I returned to school, hoping that a Masters program in Education could help – and it did, albeit in unexpected ways.

In grad school, I began to understand the role education has played, and continues to play, in creating the very sorts of 'problems' I believed education could 'solve.' I also began to recognize how education – in general, not only CS education – can constrain the possibilities for making meaningful social change by (re)producing social, political and economic structures that are difficult to think or work around. I began to notice the ways in which I myself am tightly tied up in those same structures, restricting my freedom on the one hand while awarding me unearned privileges on the other – privileges made possible by violence against marginalized people(s), animals and the environment. I began to recognize the need for political action alongside a *critical* education – and that led me, eventually, to organize just such an intervention.

This intervention was a three-hour workshop organized for (and a little bit with) friends and former colleagues. What connected us was our shared involvement in the tech industry. Some of us have jobs at tech companies, some of us used to, some of us study CS or work in CS education, and some of us may not identify as belonging to the tech industry.[14] Yet what brought us together was our interests in discussing "tech-related social justice issues" as a group.[15]

The workshop was therefore a deliberate political step I was making on the path of learning to no longer render the world in technical terms. It was a step I hoped to take together with my community, so that we may look at and begin addressing social and political issues in tech *together*. To do that, we would therefore all have to learn to think beyond the limits imposed by the processes of rendering technical. And that meant that first I would have to

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13. See Breslin, "Making of Computer Scientists," 132-142. Note that while this accurately describes my initiation into computer science, it's conceivable that other disciplines also frame their students and practitioners as 'uniquely capable of shaping the world.' Breslin does not claim that CS students are the *only* students taught to understand themselves that way; she does observe, however, that this belief is widely shared among CS students and practitioners.

14. The term 'tech' I have been using unproblematically so far. I have taken for granted its most common associations with digital technology and Silicon Valley. In chapter 5, however, I discuss how mainstream conceptions of what tech is or is not has significant social and political implications. I nevertheless stick to this term because, for the most part, it's one that my friends, my colleagues and I use casually in day-to-day conversations, to refer to the work that we do and the community we belong to.

15. "Tech-related social justice issues" is how I described the workshop's purpose in email invitations to participants.

begin learning about how to teach (and learn from) others in ways that may contribute to social change.

2.3 Pedagogical content knowledge (PCK) for education for social change

In preparing for the workshop I have learned a little bit about what it might take to think past the limits of rendering technical with others. In education research, the concept of 'pedagogical content knowledge' (or 'PCK') has been proposed and developed to refer specifically to that sort of knowledge, namely to the knowledge that facilitates the teaching and learning of particular content. As my colleague Lis Sulmont puts it in her own Masters thesis, "PCK is content knowledge *for teaching*."[16] Lis taught me also that a popular formulation of PCK suggests "four main components: (1) conceptions of purpose for teaching subject matter, (2) knowledge of student's understanding, (3) curricular knowledge, and (4) knowledge of instructional strategies."[17]

While this is a useful starting point, education for social change requires further considerations. The work of Rick Arnold and his colleagues I found particularly useful as a practical entrypoint into educating for change, and while their book does not refer to PCK explicitly (it is not written for academics), it is essentially a book about PCK for what they call 'transformational' education.[18] According to them, social change educators must also: (1) pay great attention to power dynamics and hierarchies between social groups – both those present in an educational space and in the rest of society, (2) place the content of what is being taught within history, and analyse also what influences different social groups have had on that content, and (3) integrate education with social and political action.[19]

Part of what this meant as I began organizing the workshop is that in order to begin moving past technically-rendered conceptions of technology, of our world, and of ourselves, the workshop participants and I would need to better understand the social, cultural, political, economic and historical contexts within which tech operates in our day-to-day lives. And as we most often live those lives in what today is still commonly known as 'Canada,' I hoped the workshop would begin a journey in which we would learn about and take responsibility for our various and uneven locations in the structure of settler colonialism.

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16. Sulmont, "Machine Learning for End-Users," 10, emphasis in original.

17. Sulmont, "Machine Learning for End-Users," 12, citing Grossman, *Making of a Teacher*.

18. Arnold et al., *Educating for a Change*. Note that there are many other ways to conceptualize or categorize such an education, some of which show up in chapters 4 through 6.

19. Arnold et al., *Educating for a Change*, chapter 1.

2.4   Exercise

Take a few minutes to think about each of the following questions and prompts. If it helps you, write your answers down or have a conversation about them with a friend.

1. As you learned (or are learning) computer science or programming, or any other technical skills related to software or software systems, how has your thinking changed?

2. When faced with an unknown technical problem, how do you approach it?

3. When faced with an unknown non-technical problem, how do you approach it?

4. Compare and contrast your answers for questions 2 and 3.

5. Apply the concept of 'rendering technical' to your answer for question 4.

Chapter 3: The structure of settler colonies like Canada

The afternoon of the workshop I rode a bus down Hastings St., from Burnaby to downtown Vancouver. It was a trip I had made countless times before. My family has lived in Burnaby almost the entire time we've been in Canada, and that bus route was one of our links to the life of the city – and still is for my parents, who live there even now. From that bus I had seen the city change and stay the same for nearly two decades, but I had never seen it, never felt it, the way I did that January afternoon.

That afternoon was a little bit warmer than is usual at that time of year, but otherwise ordinary. Inside the bus it was calm, quiet, if any of the other passengers were as anxious as I was to get to their destinations, I couldn't tell. Some of them were in silent communion with their phones, others with a book or one of the free newspapers. Some were in hushed conversations, others watched the city go by, like I did. There was no exceptional detail, either in the bus or outside, that caught my eye. It was all normal; but an assumed and settled 'normal' I only then, despite the countless times I had traveled that bus route, began to recognize as an ordinariness created and maintained by violence, and its denial. Violence structured by the relations of settler colonialism.

3.1   The structure of settler colonialism

Until quite recently, like most Canadians, I didn't give colonialism much thought. The idea of it didn't come up very often in my day-to-day life, and when it did, it brought to mind something that happened in the past, something violent and unpleasant but that has been over and done with for centuries. I studied computer science, I traveled the world, I taught computer programming – all the while with this myth securely and deeply seated within me. That I was able to go about my life undisturbed by its violent falseness testifies to the fact that the structure of today's Canadian society, for the most part, works in my favour.

In the process of coming to see and think beyond the boundaries of a technically rendered world, in particular as I overcame the shock of being exploited on a tech job that was supposed to be a dream come true, and as I struggled to understand how an industry touted as world-changing could be so toxic to women, I learned much about how capitalism and patriarchy structure the social hierarchies of life in Canada. But it wasn't until grad school that I began to learn how capitalism and patriarchy are enmeshed in the structure produced and reproduced by ongoing colonization, in the structure of settler colonialism – so named because here the colonizers came to stay. Canada's settlers didn't have the intention of returning 'home.' Instead, they came to appropriate land and turn it into their property, building new 'homes' and communities in a process that continues today.

The fundamental relationship in settler colonies like Canada is therefore about the appropriation of land. And the erasure of the Indigenous person, in order to justify that appropriation, is at its core. Settlers believe this theft is legitimate by invoking the concepts of 'discovery' and 'terra nullius,' or the idea that the 'new world' was/is uninhabited and thus ready to be made into their 'property' through their working of the land. But white settlers didn't just work the land themselves (or sometimes even at all) – slaves were also imported to extract wealth from the land.[1] However, while a white settler's labour makes the land 'his,' a slave's labour does not.

This relationship produces a racial hierarchy in which white settlers – white Europeans and their descendents, like me – dominate over different peoples that are racialized in different but connected ways. Seeking to develop or strengthen solidarities between racialized peoples in the United States, which, like Canada, is also a settler colony, Andrea Smith has conceptualized a framework for understanding and challenging white supremacy by delineating its different, yet overlapping, logics. In this framework, the three most important logics of white supremacy, what Smith refers to as the three 'pillars' of white supremacy, are slaveability/anti-Black racism, genocide, and Orientalism.[2]

3.1.1 Anti-Blackness

In Smith's framework, the logic of slaveability is rooted in the construction of Black/African peoples as white property. As capitalism requires the commodification of all workers in order to turn the surplus value of labour into profit, she argues that this pillar supports capitalism because slavery is an extreme form of worker commodification. A racial hierarchy that renders only *Black* bodies as slaveable therefore reassures all other workers that there is a limit to *their* commodification, and it is the acceptance of this consolation prize that reproduces capitalism.[3]

While separating this first logic from the other two is useful in thinking through the relations of settler colonialism, Afropessimist scholars argue that Smith makes a crucial mistake in how she understands slavery. Frank Wilderson explains that the common conception of slavery as forced labour is only an "example of the *experience* that slaves might have," arguing, instead, that slavery is "social death."[4] That the slave is socially dead means three things. First, it means that the slave's body is structurally vulnerable to gratuitous violence. Violence against the slave, in other words, does not depend on the slave's breaking of a law or social norm; instead, the slave's body is always "open to the violence of all others."[5] Second, it means that while a slave may recognize their parents, siblings, or children, the world does

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1. Contrary to what most Canadians seem to believe, Canada does indeed have a violent and brutal history of slavery. For an overview, see Maynard, *Policing Black Lives*, chapter 1.

2. Smith, "Indigeneity, Settler Colonialism," 1.

3. See Smith, "Indigeneity, Settler Colonialism," 2.

4. Wilderson III, "The Master/Slave Relation," 18, emphasis in original.

5. Wilderson III, "The Master/Slave Relation," 18.

not. 'Family,' therefore, is not a concept that includes slaves and their relations. And third, it means that the slave lives in a *state* of dishonour and disgrace. That is, a slave is dishonoured and disgraced even if they do not act in ways that are dishonourable or disgraceful.[6]

What this means is that slavery is not a labour-capital relation, but a relation between the non-Human and the Human – that is, between the Black and the non-Black.[7] This removal of Blackness from humanity, in Jared Sexton's words, is the "impossible debt" that financed the construction of the modern world. This debt financed "[n]ot only the infrastructure of [the modern world's] global economy but also the architecture of its theological and philsopophical discourses, its legal and political institutions, its scientific and technological practices."[8] And this anti-Blackness did not end with emancipation. Wilderson calls 1865 a "blip on the screen," in that all that changed for slaves/Blacks is the *experience* of social death but not the *paradigm* of anti-Blackness.[9]

Throughout the work of organizing the workshop and writing this thesis I have held on to Smith's framework of the three pillars of white supremacy as it is still useful in understanding the relations of settler colonialism. However, I have replaced her conceptualization of anti-Blackness as extreme capitalism with the Afropessimist one of anti-Blackness as social death.

3.1.2 Genocide

The second pillar of white supremacy, in Smith's framework, is the logic of genocide which works to disappear Indigenous peoples *as* peoples.[10] In other words, Indigenous peoples are always understood to be literally disappearing, or otherwise being incorporated into settler society by becoming 'Canadian.' These genocidal processes can take the form of direct violence and removal from ancestral lands, as well as of colonial governing policies that seek to destroy Indigenous languages, cultures, kinship structures and ways of life.[11] In either case, Indigenous claims to land are dismissed and the settler becomes the rightful and uncontested owner of previously-'Indian' land.

While land is fundamentally what settlers are after, in the process of clearing that land of Indigenous presence, settlers also come to understand themselves as the rightful 'inheritors' of everything that was 'once' Indigenous. This means that settlers, imagining that Indigenous

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6. See Wilderson III, "The Master/Slave Relation," 18.

7. I capitalize the word 'Human' here following the examples of Sylvia Wynter and Rinaldo Walcott. They capitalize the word to refer not to humans as beings, but to how 'Human' has been defined in (anti-Black) European philosophy. See Walcott, "Problem of the Human," 93.

8. Sexton, "The Vel of Slavery," 593.

9. Wilderson III, "The Master/Slave Relation," 18.

10. If 'genocide' feels too strong a word, see, for instance Starblanket, "'Kill the Indian in the child'," which demonstrates how the residential school system fits the U.N. definition of genocide, as do the ongoing effects of residential school trauma.

11. For two non-academic overviews of these processes, see the computer game: Indian Land Tenure Foundation and Entertainment and Learning Lab, "When Rivers Were Trails"; and Hill, *The 500 Years of Resistance Comic Book*.

peoples have disappeared or are about to, understand themselves as the uncontested 'owners' of Indigenous culture, knowledge and spirituality.[12]

3.1.3   Orientalism

The third pillar Smith calls 'Orientalism' as she builds its conception on the work of Edward Said.[13] It represents a logic that sees all other people of colour – that is, all non-Black and non-Indigenous people of colour – as subjects of inferior civilizations. These inferior civilizations are imagined and constructed as constant threats to the imperial ambitions of the white settler-colonial state. Their subjects are understood as forever foreign, even when they have resided within the borders of the settler-colonial state for generations. This pillar, Smith argues, therefore anchors war, as it is only through constant war that foreign threats can be contained and white domination secured.[14] Overseas wars of empire are driven by this logic, but so are the wars waged within or around the borders of the settler-colonial state. Islamophobia, anti-immigration movements, deportation regimes, migrant detention centers – these are all informed by the logic of Orientalism.

3.2   Settler colonialism is more than the sum of its parts

The three pillars of white supremacy, and the racist logics they describe, emerged out of long histories of theorizing race on Turtle Island.[15] Earlier conceptions of race that focused only or mostly on how one particular group is racialized led to contradictions that threatened to undermine the anti-racist or anti-colonial work of other groups – thereby leaving white supremacy intact.[16] An understanding of how these logics work to oppress different groups in different ways therefore offers insights into how white supremacy can be challenged on more than one front, and hopefully with more successful outcomes. Evelyn Nakano Glenn argues that such an understanding encourages us to notice how "racisms targeting different groups are not identical and … different racisms cannot be made equivalent by drawing analogies between differing forms of subordination, for example between chattel slavery and labor exploitation." She goes on to say that despite these differences, however, "settler colonialism rests on social, economic, and political underpinnings that link racisms."[17] In other words, while it's important to keep in mind that these logics create different forms of oppression for different groups, it's just as important to understand that they overlap in complex and messy

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12. See Smith, "Indigeneity, Settler Colonialism," 2.

13. See Said, "Introduction."

14. See Smith, "Indigeneity, Settler Colonialism," 2.

15. Turtle Island is how some Indigenous peoples refer to North America. It's a term I've seen frequently in scholarship on Canadian settler colonialism and decolonization, but it is not one shared by all the Indigenous peoples of these lands. I'm using it here, then, not as a definitive 'Indigenous' name for the territories I occupy, but rather as a way to decentre colonial place names and challenge settler futurity.

16. See Glenn, "Settler Colonialism as Structure."

17. Glenn, "Settler Colonialism as Structure," 61.

ways that shift and change over time, that manifest in different ways in different contexts, and that work through and reinforce each other, as well as through other oppressive social relations as informed by patriarchy, homophobia, transphobia, ableism and capitalism. While I'm still learning about the complex ways these systems inform one another, the following two sections give a brief overview of the way settler colonialism is interconnected with (settler) gender relations, and with capitalism.

3.2.1   Settler colonialism and gender

Hierarchical concepts of gender and sexuality that define cisgender, endosex, straight men as 'default' or the norm, and all others as inferior or subordinate, were not only brought to the colonies by Europeans but also actively deployed towards the establishment and consolidation of white supremacy. In English colonies, settlement was encouraged for entire families (defined the English way, that is, as a nuclear unit made up of a property-owning male 'head of household,' a wife whose labour is controlled by her husband, and children). 'Heads of households' were allotted much larger plots of land for settlement than unmarried men or men under 18, which was "designed to encourage heteropatriarchal nuclear households."[18] This system not only facilitated the theft of Indigenous land, but also helped establish heteropatriarchal gender relations by concentrating power into the hands of white men, the only people legally able to own property.

European conceptions of gender were also used to justify the appropriation of land. White settlers, for instance, perceived Indigenous women as being 'too masculine' because they shared in physical labour with Indigenous men. This was understood in tandem with the perception of Indigenous men as lazy – because Indigenous women did too much physical work, Indigenous men were therefore not as 'hard working' or 'industrious' as white men, and thus the imposition of colonial gender norms was part of a process of bringing 'material progress' to the natives.[19] Similarly, residential schools were designed not only to destroy Indigenous cultures, languages, kinship structures and ways of life, but also to funnel Indigenous children into menial labour and servitude divided according to settler gender norms. Indigenous boys "were trained in farming and trades and girls in domestic skills."[20]

While these are only a few examples, it should be clear that gender and the logic of genocide work together in the settler-colonial project – indeed, they also work together with the other logics of white supremacy, such as Orientalism. Shaista Patel notes, for example, that Indigenous poverty is part of what forces hundreds of Indigenous youth to join the Canadian military every year, and to therefore participate in imperial wars in places like Afghanistan. This implicates them in violence against racialized peoples far from Canada, while the traumas

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18. Glenn, "Settler Colonialism as Structure," 55-59, quote on p. 56.
19. Glenn, "Settler Colonialism as Structure," 56.
20. Glenn, "Settler Colonialism as Structure," 57. Note that residential schools are known as boarding schools in the United States.

of war also contribute to violence in their own communities after they return home – violence which is often directed towards Indigenous women and girls.[21] Sunera Thobani also observes that in the so-called 'war on terror,' "the Muslim woman is constructed as the victim who needs to be rescued from her religion and her culture."[22] In this example, therefore, gender and the pillars of genocide and Orientalism all factor into justifications for and expressions of violence against racialized peoples.

The effects of imperial wars also factor into how gender and anti-Black racism work with and through one another. Robyn Maynard recounts how in the early 90s, most Somali refugees in Canada were single mothers fleeing conflict. At that time, an unsubstantiated government report declared that Somali refugees were involved in massive "welfare fraud." Despite evidence provided by other government studies that welfare fraud was insignificant, and that whatever fraud existed "could be best addressed by making benefits more adequate," the government of Ontario used the image of Black women – in particular Somali and Caribbean women – as undeserving recipients of social assistance in order to criminalize welfare practices that had been part of "poor women's survival strategies [for decades]." This, Maynard argues, fits into a long history of anti-Black racism which frames "Black women's poverty ... not as a result of state processes, but [as being] because of their inherent criminality, laziness and calculated dependency."[23]

3.2.2 Settler colonialism and capitalism

White supremacy and capitalism are also tightly linked and interconnected. Their shared histories start at least as early as 1492, when the European invasion of the so-called Americas began.[24] Over the centuries, they have continued to work together and through each other to consolidate power for certain groups, most of all for white property-owning men. One way to piece together some of their connections is by investigating Canadian immigration policies and the policy of multiculturalism through the logics of capitalism and white supremacy.

In the first few decades after the Second World War, capitalism boomed in Canada – but European immigration was no longer enough to meet the rising demands for labour. At the same time, in the aftermath of the Holocaust and in the midst of the Civil Rights era, the Canadian state worried that hanging on to its explicitly-racist immigration policies would create 'bad PR' for the country. As Sunera Thobani notes, Canadian government officials "were concerned that international perceptions of such policies could have potentially damaging effects on national interests, including Canada's participation in the United Nations and the Commonwealth."[25] This was because new nations that had previously been under direct colonial

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21. Patel, "Defining Muslim Feminist Politics."
22. Thobani, *Exalted Subjects*, 218.
23. Maynard, *Policing Black Lives*, 131-134.
24. See Moore, "Masters and Possessors of Nature."
25. Thobani, *Exalted Subjects*, 147.

control of European powers were important markets for capitalist expansion – which is to say that Canadian government policies insisting on the inferiority of these nations' citizens were going to be bad for business.[26]

To address these concerns, the Canadian government made changes to immigration policies, and developed new multiculturalism and bilingualism policies in the 60s and 70s. While these policies were heralded as creating a new, welcoming and tolerant character for Canada, a closer examination makes clear that they instead solidified whiteness and white supremacy. For instance, the Royal Commission on Bilingualism and Biculturalism, a series of reports that led to the Official Languages Act and later to the Multiculturalism Policy, repeatedly leans on the settler colonial idea that the English and the French are Canada's two "founding races."[27] Despite Indigenous resistance to this particular interpretation of a long history of genocide and occupation, claims of Indigenous presence before European settlement were simultaneously ignored[28] and incorporated into imaginings of Canada having always been multicultural.[29] This has furthered processes of dispossessing Indigenous peoples of their ancestral lands, because, as Sunera Thobani observes, their "claims to special status as the original inhabitants of the land" are "discredited" on the basis that Indigenous peoples now represent "only one among several cultures" that contribute to the Canadian 'mosaic.' She also remarks that Canada's government deliberately chose to fill labour shortages by bringing in more immigrants, rather than by prioritizing employment for Indigenous people already present within Canada's borders. This was because more employment for Indigenous people would mean that less Indigenous nations would remain dependent on the Canadian state. To ensure that Indigenous peoples would not find more power to challenge the theft of their land, government policy could not risk their economic empowerment.[30]

Anti-Black, Orientalist and capitalist logics also continue to work hand-in-hand with immigration policies. For instance, the Seasonal Agricultural Workers Program continues to import tens of thousands of workers every year, mostly men from Mexico and the Caribbean, who are forced to live and work in highly exploitative conditions. Such workers "remain prohibited from joining unions, and reports continue to note that workers are paid exploitatively low wages, often work twelve- to fifteen-hour days and are placed in substandard housing."[31] Despite paying taxes, many migrant workers in Canada are also denied access to health care or employment benefits – indeed, if they become sick or are injured as a result of their work, instead of being offered medical care they are often fired and deported. And in 2013, out of forty thousand migrant agricultural workers, only 173 were able to leverage their work into Permanent Residency.[32] Racist and capitalist logics therefore continue to extract wealth from

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26. See Thobani, *Exalted Subjects*.

27. See Haque and Patrick, "Racial Hierarchisation of Language"; Walcott, "The Book of Others."

28. Again, see Haque and Patrick, "Racial Hierarchisation of Language"; Walcott, "The Book of Others."

29. See Thobani, *Exalted Subjects*, 173-174.

30. Thobani, *Exalted Subjects*, 172-175.

31. Maynard, *Policing Black Lives*, 68.

32. Maynard, *Policing Black Lives*, 68-71.

racialized people and to dispose of them when they are no longer profitable – this all taking place on stolen land. All the while, white supremacy is secured.

3.2.3   Settler colonialism and ableism

Disability studies is a notable gap in my research. I had the opportunity throughout my graduate studies to address this gap, but for the most part, it was only after the workshop that I began a more deliberate effort to learn about the disability community. In an earlier draft of this section I focused my attention on accessibility, but my supervisor challenged my perspectives on disability by reminding me that there is much more to disability justice than accessibility. And while I am still learning, I am already certain that critical studies of disability offer significant implications for thinking about settler colonialism, decolonization and abolition.

Nirma Erevelles and Andrea Minear illuminate how there are "historical contexts and structural conditions" that interlock disability with other identity categories such as race, gender and class, and that produce specific forms of oppression.[33] For instance, projects and discourses of eugenics are often justified by an ideology of disability which "[invokes] biological difference as the 'natural' cause of all inequality."[34] The attribution of mental or bodily deficiencies to poor and racialized peoples, segregation, forced sterilizations and miscegenation laws must therefore be understood as the interlocking of race, gender, class, sexuality *and* disability.[35] While I cannot speak about this in much detail yet, it is clear to me that eugenicist projects and discourses are informed by multiple forms of oppression, including ableism and racism, and that therefore resisting and undoing ableism is part of dismantling white supremacy.

Take as an example Canada's immigration laws and practices that deny Permanent Residency to disabled people, ostensibly because they may become 'burdens' on state health or social services. Kim Sauder writes that this policy can only be understood as being ableist, because it's impossible to prove just how much of a 'state burden' a disabled person may or may not be in the future, and because there is no requirement for non-disabled applicants for Permanent Residency "to prove that they will never contract cancer, experience a disabling accident or simply experience prolonged unemployment necessitating the use of social supports."[36] Sauder also notes that mainstream rhetoric on the denial of immigration applications on the basis of ability tends to itself reproduce ableism because the focus is often on a few sensationalized stories in which families are denied Permanent Residency because of a disabled child. "Disabled people in these scenarios are not seen as having any inherent value beyond

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33. Erevelles and Minear, "Unspeakable Offenses," 127-131.
34. Erevelles and Minear, "Unspeakable Offenses," 133, citing Erevelles, "Dialectics of Difference."
35. Erevelles and Minear, "Unspeakable Offenses," 131-134.
36. Sauder, "Canada's Immigration Policies," n.p.

that they may be cute children," she writes, and goes on to argue that ableist immigration policies would be harder to defend if Canadian society did not de-value disabled people.[37]

In the previous two sections, I discussed how Black women were specifically targeted by the Candian government because they were imagined as placing an undue burden on state social services, and racialized migrant workers were deported if they became sick or injured – in other words, disabled – on their job. While it is important to keep in mind that anti-Blackness, Orientalism and ableism target migrants and immigrants in different ways, there are parallels in how these logics are deployed by the Canadian state to police its borders, to manage 'undesirable' populations, and to reproduce a system of power that privileges able-bodied white men.

Beginning to study disability more critically also from a technological angle, I find the work of Aimi Hamraie and Kelly Fritsch useful. As disabled scholars and activists, they argue that disability is not "a problem in search of a solution," an idea particularly popular with able-bodied producers of technology, and in line with what one would expect from technologists socialized into the processess of rendering technical.[38] Instead, they put the concept of "crip" – "the non-compliant, anti-assimilationist position that disability is a desirable part of the world" into conversation with science and technology.[39] In doing so, they acknowledge that many of the technologies that create accessibility for disabled people have been produced, and are embedded within, capitalism, militarism, colonialism and the destruction of the environment, but that science and technology can nevertheless "be a transformative tool for disability justice."[40] They call for scholars and activists to "struggle for a more accessible future in which disability is anticipated, welcomed, and in which disabled people thrive."[41] In chapter 6 I write more about how in the process of organizing the workshop it was only very late that I began to think about the importance of such a struggle, but today I see it as crucial to conversations about ending white supremacy.

3.3 Sitting with the theories

The last time I had taken that Hastings St. bus, about half a year earlier, I was only just beginning to sit with these theories. Learning – for me anyway – is a slow, deliberate and often uncomfortable process, and it had taken me some time to incorporate enough insights from these theories to change the ways I experienced the world around me. And that afternoon before the workshop, the destructive logics of white supremacy sat with me, only for the first time consciously, as I watched the city through the windows of the bus.

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37. Sauder, "Canada's Immigration Policies," n.p.
38. Hamraie and Fritsch, "Crip Technoscience Manifesto," 4.
39. Hamraie and Fritsch, "Crip Technoscience Manifesto," 2.
40. Hamraie and Fritsch, "Crip Technoscience Manifesto," 3.
41. Hamraie and Fritsch, "Crip Technoscience Manifesto," 6.

The city's constructions – paved streets and sidewalks, shops and restaurants, electric and telephone lines, cars and bikes and parking metres – were no longer common and banal objects I had seen countless times. Seeing them that day brought to mind the tangled networks of settler-colonial relations that made them possible – the stolen land upon which they were built, the illusion of permanency they created and the settler futurity they projected, the traces of genocides and holocausts you would surely find if you followed the money that paid for them. I wondered if the land was suffocating under the weight of the violent history each lamp pole and newspaper box carried.

On the bus, the phones in our hands and pockets, disposable remedies for the tediousness of waiting to arrive at our destinations, were anything but sleek, innocent, or ephemeral. Their shiny screens said nothing about the blood and sweat that had brought them into being, their myriad apps distracted from the voracious appetites they created for rare metals and disposable people, their insides held hidden cancers waiting for our boredom with last year's device so they can be released in faraway landfills and rivers and towns.

The tangle of thoughts, memories, questions, fears, doubts and hopes, in my heart and in my mind, made my stomach ferment. As Donna Haraway tells it, I was "staying with the trouble," refusing to run away from the ugly and upsetting.[42] I remembered that in a few minutes the bus would take us through Downtown East Side. Riding through that neighbourhood as a boy, in the back of my parents' cars, my father would lock the doors, heeding the advice of others who had settled these lands before us. Once, when we were stopped at a red light, a woman approached our car and tried the locked doors in vain. I remember she was distressed and in panic, but not what she said. I also remember feeling relieved when the light turned green and we drove off. Ignorance and denial is what always got us through those few blocks of Hastings St. Like all good settlers, we averted our eyes and minds with casual ease, looking only to see justifications, understanding only enough to feel fear, sometimes pity, never responsibility.

Will I see something different today? I wondered. *Would it matter much? I've got all these theories in my head, but what do I know, specifically, about the Downtown East Side? Tonight I'll still sleep in my parents' home, knowing that what the three pillars of white supremacy also describe is why that home, and why my life, is so damn comfortable…*

3.4   Decolonization and abolition

The workshop I had organized and was on the way to go facilitate held within it, for me, a hope that together with my communities we might find ways to decolonize Turtle Island and abolish anti-Blackness. In the words of Eve Tuck and K. Wayne Yang, decolonization means "the repatriation of Indigenous land and life."[43] This, fundamentally, requires that the land

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42. Haraway, *Staying with the Trouble*.
43. Tuck and Yang, "Decolonization Is Not a Metaphor," 21.

stolen by white settlers such as myself must be returned to Indigenous communities/nations. While learning what it means to be a settler on stolen Indigenous land is also important, Tuck and Yang maintain that this can only ever amount to a sort of "settler harm reduction" and that land *must* be returned in order for Indigenous land and life to flourish.[44]

Over the last few years, there has been some discussion at the levels of the Canadian state and of widely-circulated media about 'reconciliation' between Canada and Indigenous Peoples living within its present borders. Leanne Betasamosake Simpson, however, warns that the ways this has been forwarded so far has been disengenous and without an honest will to change the settler-colonial structures that continue to dispossess Indigenous Peoples of their lands. Canada's weak reconciliation projects have instead been done to "neutralize Indigenous resistance, so as not to impinge upon the convenience of the settler-Canadians."[45] Through her work of theorizing decolonization from within Nishnaabeg thought,[46] she has learned that decolonization requires a resurgence of Indigenous ways of life. She writes that

> reconciliation must be grounded in cultural generation and political resurgence. It must support Indigenous nations in regenerating our languages, our oral cultures, our traditions of governance and everything else residential schools attacked and attempted to obliterate. Reconciliation must move beyond individual abuse to come to mean a collective re-balancing of the playing field... Canada must engage in a decolonizing project and a re-education project that would enable its government and its citizens to engage with Indigenous Peoples in a just and honourable way in the future.[47]

For this to be successful, all the logics of white supremacy must be named, challenged, and destroyed. Decolonization projects must therefore return Indigenous land while also aligning with projects working to dismantle empires and to abolish the afterlives of slavery (such as prisons, borders, policing, and state surveillance). In my central goals for the workshop I have chosen to also highlight abolition, however, because decolonization projects that do not take anti-Black racism into account may unknowingly deepen anti-Blackness. For instance, decolonization projects that frame the settler-colonial conflict only between Indigenous nations/communities and the Canadian state will inevitably also frame the descendents of slaves, and Black people in general, as being out of place on Turtle Island.[48] Challenging white supremacy from a decolonial and abolitionist perspective would therefore have us looking to undo the pillars of genocide, anti-Blackness and Orientalism simultaneously. My current understandings of decolonization and abolition are therefore intertwined, despite their

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44. Tuck and Yang, "Decolonization Is Not a Metaphor," 21.

45. Simpson, *Dancing on Our Turtle's Back*, 24.

46. "*Nishnaabeg* is translated as 'the people' and refers to Ojibwe, Odawa (Ottawa), Potawatomi, Michi Saagig (Mississauga), Saulteaux, Chippewa and Omámíwinini (Algonquin) people." Simpson, *Dancing on Our Turtle's Back*, 25

47. Simpson, *Dancing on Our Turtle's Back*, 22-23.

48. See Sexton, "The Vel of Slavery," 591-593.

potential contradictions. And as another starting point for thinking about such a political project, to complement and challenge those proposed by Smith and Tuck and Yang above, I refer to Rinaldo Walcott. He proposes a political project that critiques the different ways colonialism and capitalism create death for Black, Indigenous and racialized peoples, and that "works the ruins of catastrophe" to create "different and new forms of human life."[49]

This being just a starting point, I expect my understanding of both decolonization and abolition to change over time. First, this is because I have only begun to learn about the logics of white supremacy and the structure of settler colonialism, and about the political projects that racialized communities are developing to challenge them. And second, this is also because as such projects unfold, new lessons will emerge that will propose new, or at least adjusted, strategies. Decolonization and abolition remain, nevertheless, my goals.

Yet, as the next chapter details, I didn't begin organizing the workshop with these goals so explicitly outlined in my mind. The workshop began as a first step towards contributing to the undoing of unjust and oppressive social relations, but it took a lot of reading, thinking, and discussing, and a little bit of community organizing, to get a clearer sense of just what those relations might be in so-called 'Canada.' As my understanding of settler colonialism developed and deepened, I focused the workshop more and more on decolonization and abolition, because I don't believe meaningful social change can be made without undoing the current relations revolving around the appropriation of land.

To say that this work is political is true, but I would like to make clear that it's not the kind of work I can compartmentalize during 'business hours.' It's not something to be done 'profesionally' in my places of work (currently, that being McGill University). Of course, the work must be done there too, because it must be done everywhere. This work has increasingly informed my entire being. Indeed, doing away with arbitrary boundaries, such as those implied by capitalist ideas like 'work/life balance,' is part of the work. As further chapters also expand on, such boundaries are part of the technologies of colonialism, serving to dull critical thinking and maintain an oppressive status quo. Refusing to see decolonizing and abolitionist work as a separate part of my life is also, for me, a way of trying to keep in mind at all times that no matter how much I may wish for it, I can never personally shed the privileges I garner by virtue of being a white settler and an able-bodied cis-hetero man in a white supremacist country.

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49. Walcott, "Problem of the Human," 103-104.

3.5 Exercise

For this exercise, consider it axiomatic that justice is an important social and political goal. That is, consider social and political justice as an accepted, self-evident truth. Starting from that idea, take a few minutes to think about each of the following questions. If it helps you, consider writing down your answers or having a conversation about them with a friend.

1. How did this chapter's content make you feel?

2. Why do you think you felt that way?

3. How are you personally positioned within the structure of settler colonialism? Think about how others identify your race, but also how your gender, sexuality, ability or wealth relate to your racial identity.

4. Considering your personal position within the structure of settler colonialism, what responsibilities might you have towards living more justly?

5. If the above questions are difficult for you to begin answering, come up with three possible things you can do that will help you begin to answer them.

Chapter 4: Finding my entrypoint into decolonization and abolition

Critical scholars identify the dominant ways of thinking in settler colonies such as Canada, and in many other places too, as being 'liberal.' They call them liberal not in the sense of the various Canadian political parties that go by that name, but in a philosophical sense. (Many people also refer to this philosophy as 'classical liberalism.') What most of all characterizes liberal ways of thinking, acting and being in the world is a focus on individuals. Missing from consideration in liberal thought, for example, are questions of how power is distributed among and between social groups; how institutions like schools or courthouses or families organize resources, rewards, opportunities or punishments; what sorts of assumptions are hidden in plain sight by the ways we think about or conceive of ourselves, each other and our world; or even who gets to decide who qualifies as an 'individual,' as 'rational,' as a being capable of thought. Liberal philosophies are therefore frequently abstract and decontextualized, imagined as separate from the histories that have shaped and continue shaping such ways of thinking.

When I started grad school, I had one foot firmly in that liberal camp. The other was testing more critical, more radical ground. Sometimes a bit gingerly, other times more rashly, but in that step was an expression of hope, a strong desire – no, a need – to abandon cynicism without averting my eyes. I had returned to school because I didn't know how to keep looking at social inequality or the destruction of ecosystems without resigning myself to apathy. As a computer programmer and later a computer programming educator, I had only in rare moments felt capable of having an appreciable impact on what most bothered me about the world I lived in. And no doubt because I rested my weight on my liberal leg, still unsure whether it was safe to transfer it to the more radical, I imagined my work to come as essentially about raising awareness of the 'bad' parts of technology.

In my first semester of grad school, in trying to stumble my way into a research project, I wrote the following questions down in my notebook:

> Why do most users of the internet have little or no understanding of the material nature of the system? As in, how the system is physically produced, operated and maintained? How can they become better informed, more aware?

> How aware are software developers of the ethical, social and environmental consequences of the software they create? How much do they care? Why / why not?

> Is it possible to teach adults empathy and compassion? What facilitates the development of empathy?

If only I could teach all these internet users and software developers about where their digital devices come from, and about the harmful ways in which they're used, I seemed to think, *then they'd change their behaviour. They'd be more responsible.* What these questions imply is a liberal assumption that what causes these problems is a lack of awareness, a lack of knowledge or of the right knowledge, and that a 'better' education could produce 'better' individuals able to make 'better choices.' Not much later than my writing down those questions, however, the work of Paolo Freire and Donaldo Macedo allowed me to notice both that assumption and its falseness.

4.1   Problem-posing education

In *The Pedagogy of the Oppressed*, Freire characterizes a traditional education in which "the teacher teaches and the students are taught" as 'banking-model' education.[1] This is a type of education in which the teacher is imagined as a (knowing) instrument for transfering knowledge into the empty heads of students – like making deposits into a bank account. A good education, in this view, would be one in which the teacher can efficiently and effectively fill students with the right facts, and, inversely, one in which the students are disciplined and obedient so as to facilitate their absorption of those right facts.

Freire argues that this process is a technology of oppression. "The more students work at storing the deposits entrusted to them, the less they develop the critical consciousness which would result from their intervention in the world as transformers of that world." In other words, banking-model education strengthens the status quo by smothering out critical thinking and drilling students into becoming obedient "automatons."[2]

Macedo, a friend and student of Freire's, explains that one way this happens is through the instrumentalization of literacy education:

> [The] instrumentalist approach to literacy, even at the highest levels of specialism,
> functions to domesticate the consciousness via a constant disarticulation between
> the narrow reductionistic reading of one's field of specialization and the reading
> of the universe within which one's specialism is situated.[3]

That's quite a mouthful if you're not an academic.[4] Put differently, he observes that treating literacy as a means to an end – such as getting a job – is a feature of banking-model education. Stripping literacy down to a skill to be taught or learned removes it from the social, cultural, economic and political contexts that create "the need for reading in the first place."[5]

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1. Freire, *Pedagogy of the Oppressed*, 73.

2. Freire, *Pedagogy of the Oppressed*, 73-74.

3. Macedo, *Literacies of Power*, 15.

4. Macedo himself knows this. He argues that language so-called 'educated' people find complex is often quite clear for so-called 'uneducated' folk, because for the latter it describes reality while for the former it challenges it. He also questions whether (elite) calls for 'simpler' language might soften and domesticate critical theoretical insights, robbing them of their power to raise critical consciousness (see Macedo, *Literacies of Power*, 5-8).

5. Macedo, *Literacies of Power*, 17.

To Macedo, this is true not only of learning to read and write, but also of highly specialized literacies one might pick up in a university. The division of knowledge into academic or professional disciplines disconnects them from the rest of the world. All of this, he argues, hinders the development of critical consciousness which, echoing Freire, maintains the unjust order of the world.[6]

It struck me, reading all this for the first time, that nearly all my experiences with formal education, at their core, could be described by the banking metaphor. My professional life as a software developer, too, seemed to mirror what Macedo wrote of literacy education. The corporate software projects I had contributed to had all been built through the deliberate division of highly specialized work. Back-end and front-end engineers, user experience and graphic designers, testers and project managers – we all had our separate roles and concerned ourselves only minimally with what was beyond them, usually just enough to put the different pieces of our work together. Most of the time, we knew little or nothing about how that fragmented work fit into the bigger social, cultural, economic and political picture. And my own vague goals of teaching internet users and software developers about all the horrible things they didn't know about tech also betray that I took banking-model education for granted. My questions pointed to what might be missing in existing education, not to whether *education itself* might be part of the problem.

Freire called the radical alternative he proposed to banking-model education 'problem-posing education.' (North American academics often refer to this and other similar approaches as 'critical pedagogy'). This is an education which assumes from the start that students are beings capable of creative reasoning and critical thinking. The hierarchy between superior teachers and inferior students is challenged by a relationship of trust and dialogue between teachers who also learn and students who also teach. In problem-posing education, learning teachers and teaching learners come together, in constant action and reflection – that is, in praxis – as they struggle for liberation. As they struggle to transform their world into one that is more just and more free.[7]

It was in reading that that I began to let go of liberal notions of behaviour change and empathy as (among the only) paths to social transformation. The more I understood that education is political – that even its very structure expresses particular (i.e. white middle-class) values and orients itself towards particular purposes (i.e. maintaining white supremacy) – the more I understood that learning is only part of what's required for social transformation. The other part is deliberate and thoughtful, therefore cautious and strategic, action, action aimed at dismantling social hierarchies.

In *The Pedagogy of the Oppressed*, Freire draws examples for such actions from the work of liberation theologists and revolutionaries such as Camilo Torres and Che Guevara, as well as from his own work. These men came from more-privileged backgrounds but worked with

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6. See chapter 1 in Macedo, *Literacies of Power*.

7. Freire, *Pedagogy of the Oppressed*, 75-83.

working class and poor rural people. In my research, I found some computing educators applying critical pedagogy, and they too work with oppressed people – in their case, poor youth and youth of colour.[8] And generally, the most critical scholarship I have engaged with speaks of/to the struggles of marginalized communities – and often, if not always, also *against* the communities I personally most belong to.

I understood the need to work collectively with others in order to make more radical social change. But where to start? Would I have to also work with 'oppressed' communities? Who are they? Where might my experience teaching computer science be needed? Could I find a community to help?

4.2   Finding a community

Questions I scribbled quickly while sitting in a research methods class in the first semester of grad school:

> How will I engage with the people my research is for? What do *they* want? How can the work be reciprocal? What comes after the research? Will we work together? How can I teach CS [Computer Science] from my particular standpoint?

> Wait: what's problematic about using CS to 'help' with anti-oppression work?

The last question came from a classmate, in constructive response to a conversation we had about the direction of our research projects. She challenged me to consider the colonial attitude in framing my possible research in terms of 'helping' marginalized communities, and suggested I swap that verb with another: 'infuse.' As in, how might CS be *infused* with anti-oppression work, or anti-oppression work *infused* with CS? And together with which communities should I infuse my CS knowledge and skills with anti-oppression work?

Erica Lagalisse writes that for white middle-class activists and leftie academics (like me), 'community' never seems to mean their own white middle-class communities. This is probably because, consciously or not, they understand that their communities are so "full of 'privileged fucking assholes with lawyers for parents' who the current system favours in every possible way … that trying to organize *their* families and people in *their* neighbourhoods would be tantamount to smashing their heads against a wall."[9] People like me, she observes, imagine 'authentic' and 'local' communities to mean "black inner-city ghettoes or Mohawk reservations."[10] Worse, she observes that we middle-class activists (and academics) use these communities as a way to assuage our white guilt, while simultaneously distancing ourselves from poor white people, who we imagine to be 'truly' racist (unlike us middle-class whites, who are 'doing something' about racism):

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8. See Lee and Soep, "None but Ourselves."

9. Lagalisse, "'Good politics'," 165 (emphasis in original). The inner quote is a phrase she frequently hears from white middle-class activists.

10. Lagalisse, "'Good politics'," 163.

> White middle class activists seek white redemption by flocking to coloured communities hoping for some "effervescence"[11] to rub off on them, but also to construct a "good" white identity by defining themselves against poor ("racist") whites and appropriating working class markers of "authenticity" at once, seeking class redemption as well.[12]

Many of the anarchist activists Lagalisse writes about do acknowledge that to 'help' marginalized communities implies a colonial logic of the helplessness of poor and racialized Others, and that they instead must work in solidarity or allyship with marginalized communities. But Lagalisse also observes that talking the talk is easy, and walking the walk is not. Colonial, capitalist and patriarchal logics still inform the ways many (white middle-class) anarchist activists organize in North America, even when they say they're 'following Indigenous leadership.'[13]

Decolonization can't happen if such logics aren't challenged and destroyed – not only in words, but also in actions. The Montreal Urban Aboriginal Community Strategy Network recently released an 'Indigenous Ally Toolkit,' a short pamphlet in which they call attention to the fact that "being an ally is not a self-appointed identity" and that anyone looking to work with(in) an Indigenous community must "show [their] understanding through actions, relations, and recognition by the community."[14] They also write that anyone wishing to act in allyship must be critical of their motivations to do so, and that learning and unlearning are a constant part of the process.

This was not something I understood as I first began thinking about finding a community to work with. That understanding developed as I immersed myself in critical takes on the ongoing histories of research ostensibly being done on behalf or to the benefit of marginalized communities.

4.3 Research and colonialism

Linda Tuhiwai Smith writes that 'research' "is probably one of the dirtiest words in the Indigenous world's vocabulary" because research is responsible for some of the worst violence

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11. The double-meaning of effervescence as in 'fizzy drinks' and also as in 'liveliness' is a reference to Stokely Carmichael and Charles V. Hamilton, who had this to say about white radicals in the 60s: "Like some sort of Pepsi generation, [they] have wanted to 'come alive' through Black communities and Black groups. They have wanted to be where the action is – and the action has been in those places. They have sought refuge from a sterile, meaningless irrelevant life in middle class America." Cited in Lagalisse, "'Good politics'," 164

12. Lagalisse, "'Good politics'," 165.

13. The central idea in Lagalisse's dissertation is that this isn't just a personal failing of the activists, but is rather an example of bourgeois identity-building. Middle-class activists and leftie academics alike are well trained in playing what she calls 'the game of good politics,' in which *representing* oneself as a 'good ally' is more important that actually undoing oppressive systems that often privilege them.

14. Montreal Urban Aboriginal Community Strategy Network, Swiftwolfe, and Shaw, *Indigenous Ally Toolkit*, 2.

perpetrated by whites against colonized peoples.[15] Anthropology is commonly looked at as the most offensive research discipline in this regard, but as Lagalisse points out,

> [a]nthropology would not have been able to slaughter and alienate indigenous people everywhere if it weren't for the sociologists that helped build the prisons, the psychologists that pathologized them, the political scientists that couldn't see politics and personhood outside of ancient Greece, the philosophers that called the "primitives" irrational and the engineers that built the weapons.[16]

Lisa Nathan and her colleagues note that computing researchers and developers, even when they claim to be producing work 'for the community,' often also "perpetuate a colonial point of view" when they frame their work in terms of an imagined "common good." They urge researchers, instead, to pay careful attention to who exactly benefits from their work, and to take cautious steps towards "unsettling" their research practices.[17]

And it isn't just in the active portion of research – the doing part of it – that we find violence, but also in the very essence of Western science. Western knowledge 'production' since Columbus invaded the so-called 'new world' has been part-and-parcel of the machinery of colonialism. "The cannon comes in the morning, the school at night" – Rubén Gaztambide-Fernández put military conquest and colonial knowledge 'production' in the same breath while speaking on a panel at the Decolonizing Conference in 2018.[18]

While the pattern is often one of military subjugation followed by the "more subtle and sophisticated" deployment of Western knowledge as tool of colonial domination, Gina Thésée also notes that the relationship is a reinforcing one: the cannon makes room for the (white) scholar, the (white) scholar justifies the cannon, and the deadly cycle continues, strengthened and strengthening with every turn. She writes, for instance, that the construction of Western philosophy's roots in ancient 'Greece' not only erases African philosophy as a whole, but also constructs Africa as a place of non-philosophy.[19] This anti-Black logic is what enabled Western science (and philosophy and art and ...) to "[produce] a coherent imperial knowledge" of the (negated) Other, thus establishing the superiority of Western epistemology through the suppression and erasure of Indigenous epistemologies.[20] Anti-Blackness thus informs the entire epistemological ordering of the modern world, as expressed in and through the academy. Sylvia Wynter argues that "the issue of 'race' and its classificatory logic ... lies in the founding premise, on which our present order of knowledge ... and its rigorously elaborated disciplinary paradigms, are based," and that in fact it's this very ordering which defines the Human

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15. Smith, *Decolonizing Methodologies*, 1.

16. Lagalisse, "'Good politics'," 40.

17. Nathan et al., "Good for Whom?," citations on p. 2 and p. 8.

18. He attributed the phrase, in his words, to a Kenyan scholar. For more on the conference, see http://decolonizingconference.com

19. Worth noting here is also how much of what's referred to as ancient 'Greece' in the context of 'Western' thinking is now also Egypt, Lybia, Tunisia and other Mediterranean countries with historically diverse populations.

20. Thésée, "Tool of Massive Erosion," 33.

as non-Black and produces gratuitous violence against the non-Human, that is, against the Black body.[21] Like the cannon and the school, violence against Black bodies contributes to Western knowledge, which then justifies continued violence.

George Dei argues that Western science not only suppresses and erases Indigenous knowledges, but in fact builds its own dominant knowledge by appropriating Indigenous knowledges.

> The disciplines of science create their knowledges out of marginalised cultures. Subjugated history becomes dominant anthropology, subjugated medicine becomes dominant 'herbal remedies', subjugated ways of understanding and naming the physical world become dominant science and technology.[22]

Because the colonial era is still ongoing, these practices continue today, for instance through the application of 'intellectual property' laws. Pharmaceutical and agricultural corporations compete with each other to 'patent' Indigenous medicinal, herbal or agricultural knowledges. This is not only a theft of what is often collective knowledge, to be placed in corporate control for the pursuit of private profit, but it can also have devastating effects by disrupting Indigenous economies or ways of life.[23]

It is also important to keep in mind that knowlege production is tightly bound to the material aspects of colonialism. Western science is built not only through the appropriation of knowledge, but also through the appropriation of land and through the human property regimes of the slave trade. For example, ships transporting enslaved Africans from their homelands to the 'new world' were sites of early developments in medicine and research methods (among other things);[24] modern accounting and corporate management techniques were developed to track the profitability of slave plantations;[25] indeed, the entire modern world was built through capitalist and colonial invasion, exploitation, enslavement and genocide.[26]

4.4   Friendship, my entry point into decolonization and abolition

Today, research can still be, and often is, colonial theft. In Tuhiwai Smith's communities,

> research was talked about both in terms of its absolute worthlessness to us [that is, to Indigenous communities], and its absolute usefulness to those who wielded

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21. Wynter, "'No Humans involved'," 47, 64, 69-70.

22. Dei, "The Denial of Difference," 22.

23. See Choudry, "Property Rights and Rice"; García, "The Taste of Conquest," 516; Kuokkanen, "Globalization as Violence," 217.

24. See Grandin, "Slavery Made the World."

25. See Green Carmichael, *Management History*.

26. See Moore, "Masters and Possessors of Nature."

it as an instrument. It told us things already known, suggested things that would not work, and made careers for people who already had jobs.[27]

Zoe Todd further warns that when settler scholars work, for instance, with Indigenous communities, "Indigenous trauma [serves as] a form of settler capital" that converts Indigenous suffering into papers, conference presentations, degrees, grants, careers, and so on.[28] If I were to look for a marginalized community to work with, it therefore wouldn't be enough simply to frame my work as an infusion of my skills and their needs; I would need to be sure, at the very minimum, that the necessity for and the drive of the work emerges from the community itself. Otherwise, could I trust my intentions, if it was I who initiated such a project? What do I really know about the needs of such a community, not from theories but from the details of their lives? Where in their list of priorities, if at all, might computer science education be found? What makes me think I know computer science better than their community does, anyway? Who am I to imagine myself as the enlightened revolutionary, coming in to foment rebellion by educating for critical consciousness, and then connecting that exercise, somehow, to computer science education so I can appease McGill's thesis requirements?

Before I even got a research project underway, reading Eve Tuck's denouncement of research framing marginalized communities as lacking, deficient or incapable, as in need of saving, nipped that idea in the bud.[29] It was another year before I started to learn about the anti-Black and genocidal logics so deeply engrained in Western science, but fortunately I already knew enough to understand that finding a marginalized community was a colonial way to start a research project. Instead, I was going to heed Elizabeth Ellsworth's advice: in her own struggles with/against critical pedagogy, she found that before entering into anti-oppressive work with someone, there must already be friendship there. Only friendship involves the trust and vulnerability this sort of work requires.[30] That was it, then: I was going to work with a community I already belong to. I was going to work with my friends in the tech industry.

Realizing I already had community and that the decolonizing and abolitionist work I want to do needs to take place everywhere, including and especially also in my own communities, I had found a place to start.

4.5   Exercise

For this exercise, consider it axiomatic that justice is an important social and political goal. That is, consider social and political justice as an accepted, self-evident truth. Starting from that idea, take a few minutes to think about each of the following questions. If it helps you, consider writing down your answers or having a conversation about them with a friend.

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27. Smith, *Decolonizing Methodologies*, 3.
28. Todd, "Indigenous Trauma."
29. Tuck, "Suspending Damage."
30. Ellsworth, "Why Doesn't This Feel Empowering?," 317.

1. What communities do you belong to? Make a small list, thinking about communities in your neighbourhood, your place(s) of work or study or worship, what hobby groups you might belong to, etc.

2. From the list you made in question 1, pick one or two communities you feel the most connected to. If you work in or are studying tech or another tech-related field, pick a tech-related community as one of your choices. Then answer the rest of the questions below with these communities in mind.

3. Keeping the structure of settler colonialism in mind, how are you positioned relative to the members of your communities? How are the different members positioned relative to each other?

4. How are your communities positioned within the structure of settler colonialism? For this question, think about each community as a whole, but do keep in mind your answers to question 3.

5. Considering your answers for questions 3 and 4, what responsibilities might your communities have towards living more justly?

6. If the above questions are difficult for you to begin answering, come up with three possible things you can do that will help you begin to answer them.

Chapter 5: Imagining the workshop

5.1 The workshop's goals

One of the first things my supervisor encouraged me to do in preparing a workshop with/for technologists, was to identify the workshop's learning goals. What follows is a list of what I wanted the workshop participants to do:

1. Share personal experiences with and knowledge of a social issue in tech that they have a stake in

2. Compare and contrast their experiences and knowledge of the issue at hand

3. Identify how different groups in society are affected by and implicated in the issue at hand

4. Describe and illustrate why and how technology is inherently political and what implications this has for the issue at hand

5. Build closer relationships with others in their industry that are committed to working together for social change

6. Create a plan of the next steps the group will take in order to begin addressing the issue at hand

7. Reflect on their positionalities relative to the issue at hand

I wanted to challenge banking-model education by meeting the workshop participants where they were, and by coming together, all of us both learners and teachers, to start posing problems in community. I saw the above learning goals a bit like mountain passes in the distance, dips in ridges we needed to get over, on our way towards decolonization and abolition. Our way to those passes could and would vary. All of us would be starting at different distances away from them – some of us would perhaps even be making our way over the smaller, earlier passes, trailblazing paths that guide the rest of us. Some might even question the passes, pushing us to see other possible ways into the valleys beyond – but that's where I nevertheless hoped we were headed.

Hiking up to a mountain pass is not easy, so I also saw the learning goals as made up of smaller ones, rocks where we could sit and rest a while, on our way up. I believed that it was within our collective reach to begin:

- conceptualizing of technology (more) critically,

- understanding why and how technology is political,

- discussing what most concerns us in/about tech,

- finding ways to move beyond only developing radical consciousness, and

- developing accountability relationships with marginalized communities.

And in order to do this as effectively as possible, I wanted the workshop's participants to be gender-diverse, I wanted them to lead the learning, and I wanted all of us to end with energy we could carry, even if only briefly, into the days beyond the workshop.

5.2   Conceptualizing of technology (more) critically

Last summer I returned from visiting my parents on Coast Salish territory[1] with three beautiful pieces of țesătură – that's Romanian for woven fabric. All three were made by hand, two of them by Bunica de la Sebeș, my grandmother on my mother's side, the third likely made by Bunicu's mother, my great-grandmother on my father's side. Here's one of the two Bunica made:

Figure 5.1:   An arm chair covered by a black woven fabric decorated with red, purple, and green geometric patterns. The woven fabric, including the pattern design, was created by my grandmother.

When we were looking through the heirlooms my parents brought with us when we immigrated to what today we know as Canada, most of them țesături like the chair covering

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1. Also known today as Burnaby, British Columbia.

pictured above, I wondered why the word 'craft' presented itself first on my tongue as a way to describe the work of my grandmother and great-grandmother. Could it be that social hierarchies, in this case patriarchy most of all, relegated the creative and skillful work of peasant women to the domain of homey 'hobbies'? Looking at the weaving I certainly felt something difficult to express in words, the way I feel after reading a good novel or watching a good movie, so why didn't the word 'art' come to mind instead? Or why not 'technology'? The țesături may feel like 'mere' embellishments in an era of consumerist glut, like simply something pretty to decorate a chair with. To eyes that for a long time have seen a technically rendered world, they did not stand out immediately as 'practical' objects that 'solve' particular problems. But in their days, my grandmother and great-grandmother spun wool and wove fabric for a variety of purposes: to decorate the icons of holy figures they hung up in their homes, to use as bedding, table-cloths, curtains or to fill other household needs, to wear as clothes, to fashion into tote bags, pencil cases, or other cloth containers, even to set aside as dowry for their daughters. So then why not think of the weaving (also) as technology?

Judy Wajcman observes that "technology tends to be thought of in terms of industrial machinery and military weapons, the tools of work and war, overlooking other technologies that affect most aspects of everyday life." This dominant conceputalization of technology emerged in the 19th century, when mechanical and civil engineering became increasingly associated with technology, while other practices, particularly domestic ones, were increasingly disassociated from it.[2]

My own conceptions of technology had been in line with that history, although, probably because I was trained as a computer programmer, 'technology' – and especially the shorter, Silicon-Valley-invoking 'tech' – I mostly imagined as specifically connected to computers. My assumption was that the friends and former colleagues I had in mind to invite to the workshop would be in a similar place. I wanted us to spend some time discussing what technology is, then, first of all to be more-or-less on the same page, but more importantly to think of it as being much more than soft- and hardware. This was going to be crucial to understanding how and why technology is inherently political.

5.3 Technology as political

Wajcman's observation that dominant conceptions of technology are associated with industry and war emerged from problematizing technology – that is, questioning its accepted meanings and non-meanings – from a feminist standpoint. The 19th century history she refers to was one in which technology came to be defined in favour of objects and practices associated with masculinity, and against those associated with femininity. "The very definition of technology, in other words, is cast in terms of male activities," she writes.[3] This has profound and important

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2. Wajcman, "Feminist Theories of Technology," 144.
3. Wajcman, "Feminist Theories of Technology," 144.

political implications. To name but one example, we find such implications in the history of the term 'software engineering.'

5.3.1   'Software engineering' and the masculinzization of programming and computer science

On the surface, the term 'software engineering' sounds like a technical one, describing the process by which software – a game, a dating platform, a military drone piloting system – is developed. Indeed, this is what I learned studying computer science. A closer look at the history of the term, however, while paying special attention to gender within that history, shows that it encompasses something that is much more than only technical.

In the book *Recoding gender*, Janet Abbate highlights the fact that the first computer programmers were women. Gender played a role in their hiring, in part because programming was yet to be seen as a challenging intellectual task – there were no stereotypes, yet, that said women made poor programmers.[4] But gender also played a role in erasing these women's contributions to early computing. When the ENIAC was first introduced to the media in 1946,[5] the focus was on the machine – engineered and for the most part built by men – and not on the programs that made the machine useful. In short, the women's work was ignored. Overlooked from the history of computer programming more generally was also the fact that in the process of programming the ENIAC, the same women also developed techniques still used today, such as breakpoints, pseudocode and calculation methods minimizing rounding errors.[6]

Women continued to play key roles in early computing through its first two decades. For example, Grace Hopper, who was employed by the U.S. military, led the team that invented the first compilers, and also invented the first business-oriented programming language.[7] But as it became clear in both the military and the corporate world that programming was important, women programmers were slowly pushed out of their jobs.

This took place through organizational practices that shifted programming-related jobs increasingly away from women and towards men. For example, after the Second World War, the British government "was the largest British employer of computing labor," and women made up the majority of those workers.[8] Towards the end of the 40s, the government institutionalized these predominantly women workers into several official 'machine grades' employment categories, and most programming-related hires came from these grades until the mid 60s. Mar Hicks writes about how that changed in the 1960s, when the government started an ini-

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4. Abbate, *Recoding Gender*, 20.

5. The Electronic Numerical Integrator and Computer, built at the University of Pennsylvania and finished in 1945, was the "first fully electronic programmable digital computer." Abbate, *Recoding Gender*, 13.

6. Abbate, *Recoding Gender*, 32-38.

7. This was called FLOW-MATIC, and it was a predecessor to COBOL. See Abbate, *Recoding Gender*, 78-80.

8. Hicks, "Only the Clothes Changed," 6.

tiative of grooming programmers into upper management. What the government wanted were programmers with 'management potential,' a.k.a. 'a penis,' because they could only imagine *men* as managers. So starting in 1962, a new recruitment policy looked to hire new programmers only from the 'executive grades' made up mostly of men in middle management positions. Women who already worked as programmers at the time, but predominantly in the less-prestigious machine grades, were not only removed from hiring or promotion considerations, but in some cases were even tasked with training less-qualified but better-paid men to replace them, eventually being demoted to become the men's assistants.[9]

The coining of the term 'software engineering' fits into this story. At a NATO conference in 1968, a bunch of 'experts' from academia, industry and government decided to append the word 'engineering' to 'software.' (I'm being snarky about the word 'experts' not only to challenge the falsehood of expertise, but also because at this invite-only conference, only men were invited. Not even Grace Hopper seemed to merit an invitation, who one would imagine qualified given her contributions to the field and the fact that at the time she was the U.S. Navy's director of programming languages and language standards...) The NATO men claimed that the idea of software engineering was new and exciting and bound to solve many of the difficulties in creating software; but some of the techniques they proposed were already in practice, and there were also many programmers who, in Abbate's words, "questioned both the feasibility and the desirability of [the new] techniques proposed." The new term was in fact more of an aspiration – a direction for the industry to take – and one that had profound implications for women.[10]

Not unlike today, gender sterotypes strongly associated engineering with masculinity. Attaching the word 'engineering' to 'software' thus gave it a higher status, wrestling programming away from its previous associations with femininity, and instead constructing it as the domain of men. Abbate notes that none of the problems the term software engineering was supposed to solve have been solved since 1968, but the linking of software with engineering seems to form part of the answer to "why women took a leading role in the first wave of software improvements but became much less visible in the software engineering era."[11]

What this history demonstrates is that a seemingly techincal term, commonly assumed to be neutral, is in fact bound up in larger political struggles shaped by patriarchy. This context never figured into my CS education, not even in a mandatory course which dedicated an entire semester to the practices and theories of software engineering. Instead, and in alignment with how it's most commonly used in the tech industry, the term was rendered technical, stripped of all contexts but the technical ones, thus creating an illusion that technology is not political.

9. Hicks, "Only the Clothes Changed," 8-13.

10. Abbate, *Recoding Gender*, 97-102.

11. Abbate, *Recoding Gender*, 104-109.

5.3.2 'Made in China,' or, Silicon Valley's sleight of hand

The computer I used to type up this thesis has seen much wear and tear, and the tiny inscriptions on the bottom of its metal shell are faded into illegibility. Once, however, I could clearly read the mark by which it distinguished itself from all the 'lesser' computers: "Designed by Apple in California." That phrase puts forth a cool Californian sexiness, and in just five words, the now ubiquitous engraving renders technical complex and uneven processes that bring together metals, miners, plastics, assembly plant workers, energy, designers, programmers, software, marketers, and much more. Apple does hint at the bigger picture by engraving, next to the branding of Apple and California, that its products are "Assembled in China," but that's only one part of the bigger infrastructure that makes hardware and software useful. Nevertheless, the nod to China is not the same as the one to California. Where the former seems to imply routine, menial labour in a foreign country, the latter conveys an impression of creativity and professionalism associated with the exciting brand of California, imagined as a sort of holy place for everything that's new and innovative and world-changing.

Kavita Philip, Lilly Irani and Paul Dourish point to how questions of infrastructure, which is as crucial to the design, development and deployment of software, are taken for granted. The often gendered and racialized labour practices that make up that infrastructure are left out of the picture, while only the programmers, designers and users are painted as the "heroic actors" of technology creation and use.[12] Similarly, Lucy Suchman notices that

> anonymous and unlocatable designers, with a license afforded by their professional training, problematise the world in such a way as to make themselves indispensable to it and then discuss their obligation to intervene, in order to deliver technological solutions to equally decontextualized and consequently inlocatable 'users.'[13]

Put differently, the engraving on my Apple computer implies that the 'heroic' work is that of the Californian designers, who, qualified by their training but also by their association with the prestigious brand of Apple, are presented as knowing what problems users need solving, and thus both as capable of and necessary to designing their solutions.

The assemblers in China don't get the same treatment; the rest of the infrastucture doesn't even get a mention. The engraving that sources my computer unevenly in California and China feeds into the marketing that creates a stand-alone 'computer' or 'digital product' out of much bigger processes. Made invisible by this marketing, for instance, are:

- The destruction of ecosystems and livelihoods as a result of mining for the rare-earth minerals used in batteries and electronic chips[14]

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12. Philip, Irani, and Dourish, "Postcolonial Computing," 11.
13. Suchman, "Working Relations of Technology," 27.
14. See Mantz, "Improvisational Economies"; Scheele et al., *Cobalt Blues.*

- The materiality of tech infrastructure, such as the staggering amounts of energy and water appropriated by states and corporations to power and cool their massive data centres[15]

- The vastly uneven relationships between American tech companies and Asian manufacturers which puts downward pressure – sometimes even fatal – on assembly-line workers[16]

- The biases built into algorithms or computing systems that reproduce and even solidify systemic oppressions such as racism or transphobia[17]

- The difficult, dirty, and dangerous working conditions for those who keep the tech infrastructure intact, such as commercial content moderators or electronics recyclers[18]

Having learned to render technical, in our education and our workplaces, computer scientists and programmers like the workshop participants and myself have a difficult time keeping such concerns in mind when we're writing code, debugging hardware, or designing user experiences. Mirroring Macedo's take on the instrumentalization of literacy, Suchman further argues that by focusing on our particular specialization within technology, we are "cut-off from others who might seriously challenge aspects of [our] community's practice."[19] Computer science education had likely trained most of us to treat computational practices as well as the societies in which they operate as metaphorical 'black boxes,' systems whose inner workings don't concern us as long as we can build technology to manipulate their inputs and outputs. A further and central goal of the workshop I was organizing was therefore to begin unlearning the black box metaphor by bringing to light and discussing issues such as the above. In other words, it was to start pushing us all beyond the artificial walls around our thinking built by the practices of rendering technical.

5.4 Discussing our concerns in/about tech

When I invited friends and former colleagues to attend the workshop, I mentioned that we were gathering specifically to discuss social/political issues in tech. The disappearing of infrastructure with all its ethical and moral implications was one such issue I had in mind. However, rather than focusing on the issues that concerned me personally, my goal was to break with the banking-model of education and focus the workshop on what social/political

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15. See Hogan, "Data Flows and Water Woes."

16. See Lin, Lin, and Tseng, "Manufacturing Suicide"; Perlin, "Chinese Workers Foxconned."

17. It seems like every week there are new examples of such biases. For two recent ones, see Hicks, "Hacking the Cis-Tem"; Johnson, "Racial Bias in Algorithm."

18. See Chen, "Laborers"; Roberts, "Digital Refuse."

19. Suchman, "Working Relations of Technology," 28.

issue(s) most worried all those of us present in the room. Nevertheless, I hoped our analyses of such issues would open up paths towards decolonization and abolition, which would require that we frame our discussions through understandings of settler colonialism.

For instance, if we were to discuss issues of algorithmic bias, we could do so by placing the design, applications and outcomes of automated systems that disadvantage or oppress Blacks, and that privilege or benefit whites, within the history of anti-Black racism. We might discuss how the data sets that feed machine learning algorithms are not 'objective' – as many of their designers, developers and defenders claim – but are instead created and interpreted within white supremacist power structures that favour dominant (that is, white) ways of sensing, measuring and understanding the world.[20] As Ruha Benjamin puts it, we might discuss how "tech designers are erecting digital caste systems, structured by existing racial inequities" that not only automate discrimination but also justify it with claims to the neutrality of technological fixes.[21] We might also, for example, consider how the state and corporate surveillance regimes that Edward Snowden revealed are not new but simply digital expansions of anti-Black surveillance regimes that have existed for centuries. Black people have been subject to white surveillance from the slave ship, to the plantation, to stop-and-frisk policing practices, to over-representation in 'predictive policing' databases – indeed, Benjamin points out how many oppressive state and corporate technologies were first developed to contain and manage Blackness before being expanded to other populations.[22]

Such discussions could also be made more complex by noting how Orientalist and eugenicist logics play out in surveillance and deportation regimes. As migrant and immigrant justice organizations note, there are tight links between U.S. state agencies like Immigration and Customs Enforcement (ICE) and Silicon Valley. As one report illuminates, companies like Amazon, Microsoft and Palantir are part of a growing network of tech companies involved in the collection, management, processing and analysis of data that is deployed in surveilling, arresting and deporting migrants and immigrants.[23] Data and computation therefore work alongside anti-immigrant and ableist rhetoric and policies to police the borders of settler-colonial nations, keeping or kicking out 'undesirable' populations and thereby solidifying white supremacy.

By bringing into our discussions the materiality of data collection, storage and analysis for corporate and state purposes, we might also find connections to the pillar of genocide. Meredith Whittaker, a former Google employee and one of the core organizers of the November 2018 employee walkouts protesting sexual harrassment at the company, observed that a lot of the engineering staff at Big Tech companies work on infrastructure – which implies how crucial infrastructure is to the business operations of such companies.[24] Yet despite the airy-

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20. See Benjamin, *Race after Technology*, 15.

21. Benjamin, *Race after Technology*, 14.

22. Benjamin, *Race after Technology*, 26-32.

23. Mijente, National Immigration Project, and Immigrant Defense Project, "Who's behind ICE?."

24. Logic Magazine, "New Tech Worker Movement," 1:14:00.

ness implied by the term 'cloud computing,' the infrastructure supporting Big Data requires staggering amounts of land, water and energy to operate. For instance, the U.S. National Security Agency (NSA)'s data centre outside Salt Lake City occupies nearly 250 acres of sagebrush, and at its full capacity is expected to use about 65MW of power and 7.7 million litres of water *every day*.[25] At the same time, many communities in Canada – and especially Indigenous communities – have limited or no access to clean drinking water, an ongoing problem caused and exarcebated by colonial occupation and governance of Indigenous territories.[26] Considering all of this, we may therefore discuss how government agencies as well as tech companies have a direct interest in occupying Indigenous land, appropriating resources, and maintaining the genocidal logics of settler colonialism in order to both justify their actions and to allow them the possibility of further expansion.

Ultimately, I hoped that by engaging with such analyses while discussing the issue(s) that most concerned us, we might find ways in which we could contribute to political actions aimed at dismantling white supremacy.

5.5 Finding ways to move beyond only developing radical consciousness

Discussing the issue(s) that most concerned us might lead to developing a more radical consciousness, but this, however, would not be enough if we wanted to truly contribute to efforts to transform oppressive social relations. bell hooks notes that a critical education is only part of the work of a critical educator:

> No radical change, no revolutionary transformation will occur in this society—in this culture of domination—if we refuse to acknowledge the necessity for radical-izing consciousness in conjunction with collective political resistance.[27]

Action is also necessary along with a critical education, as without action education alone can't decolonize. Eve Tuck and K. Wayne Yang argue that even an education aimed towards emancipation can't be said to be 'decolonizing' as long as all the work takes place in the mind, because "decolonization specifically requires the repatriation of Indigenous land and life."[28]

Afropessimist scholars, on the other hand, do not see a 'way out' of the relationship between the non-Human and the Human, that is, between the Black and the non-Black. "[What]

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25. Hogan, "Data Flows and Water Woes," 4-5. While calculating power and water usage relative to some other more familiar form of consumption is difficult, consider that 65MW/day means that the data centre uses as much power as it would take to power 1,000,000 65W lightbulbs for an entire day. A typical North American style toilet uses something around 7.7 litres of water per flush, so that would mean the data centre uses as much water as it would take to flush a toilet about 1,000,000 times.

26. See Vowel, *Indigenous Writes*, 188-195.

27. hooks, "On Self-Recovery," 29.

28. Tuck and Yang, "Decolonization Is Not a Metaphor," 19-22, quote is on p. 21.

Black people suffer is real and comprehensive but there is actually no prescriptive, rhetorical gesture which could actually write a sentence about how to redress [the relation between Blacks and non-Blacks]," says Frank Wilderson.[29] Unlike being able to say that decolonization is about the repatriation of land, there is nothing that can be put forth as a path to abolition – and I had no illusions about us being able to find such a path. Nevertheless, I hoped we would find some ways to move beyond only developing radical consciousness.

5.6 Developing accountability relationships with marginzalized communities

Keeping in mind Ellsworth's remark that it's not possible to do anti-oppressive work with anyone but your friends,[30] engaging in political issues in tech that go beyond my own community means that we must also, at some point, develop accountability relationships with marginalized communities.

This was going to be difficult – if not impossible – in a three hour workshop, so as a first step towards this longer-term goal I wanted to find ways to bring into our discussions the experiences, words, knowledges and worldviews of those not present in the room.

In particular, I wanted to incorporate in our discussions the voices of Indigenous and Black peoples, of women in technology, and of those exploited or harmed by the development or deployment of computer technology.

5.7 Inviting workshop participants to lead our collective learning

There were two main overlapping reasons why I wanted the workshop – its themes, its discussions, its potential follow-up actions – to be led by the participants. The first was that the long-term path I wanted to guide us towards is one that nobody knows how to walk. Neither decolonization and especially not abolition have steps to follow. This meant that while I believed I had much to offer possible participants in discussions of technology and politics, I was not going to be 'the expert' in the room. I wanted to create a learning environment where our collective intelligence could shine, as we worked together to create new knowledge, achieve deeper insights, and ask questions that could take our learning further.

Tied into this motivation is the second reason why I wanted participants to lead the workshop: I assumed that the past educational experiences of most, if not all the people I had in mind of inviting to the workshop, would likely resemble the banking-model. I worried that our histories, shaped by our social locations as middle-class, educated, and for the most part securely-employed technologists, would be barriers to seeing ourselves as capable of acting

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29. Wilderson III, "The Master/Slave Relation," 22.
30. See chapter 4.

directly to address the problems we face. I did not want the participants to feel the unproductive comfort of learning from an expert or of deferring action to the 'proper authorities.' Instead, I wanted us all to practice seeing ourselves as knowledgable and as capable of organizing for social change.

It would therefore be my responsiblity to organize the workshop, but it would be all of us, and especially the participants, that would drive our discussions, and our learning and teaching, during the workshop itself.

5.8 Gender diversity

Over the last several years, much attention has been paid, and rightly so, to sexist work cultures and practices that make and keep tech predominantly male. This narrative, however, is based on a tendency to place programmers and designers at the 'core' of the tech industry. One of the reasons I wanted us to problematise tech(nology) was that defining tech so narrowly actually contributes to the gender disparity. Wendy Cukier and her colleagues studied the discourses surrounding the tech industry in Canada, finding that the definitions keep changing over time, and that a very broad range of skills are required in the industry. They argue that, in spite of this, the reason tech is commonly associated with computer science and engineering is because "leaders in the [Information and Communications Technology] profession are often men who are computer scientists and engineers" who exert their institutional power to shape how tech is talked about and understood.[31]

My background as a progammer, however, means that my experiences of tech have indeed been at that unquestioned 'core' dominated by men. It had therefore been important for me to keep gender in mind when inviting participants. This was foremost a question of representation; I wanted the voices in the room to be as diverse as possible. But I was also careful to ensure that the workshop, beyond just the invitations, would be well-attended by women. That's because I did not want a minority group of women in the room to feel intimidated to potentially engage questions of gender during the workshop.

Given my goals of decolonization and abolition, it may seem surprising that I found it important to pay attention to gender when inviting participants, but not race or other aspects of identity. While some of the friends I was going to invite are non-Black, non-Indigenous people of colour, most of my friends, especially those in tech, share with me at least the privileges of being middle-class. My dominant social positions relative to other aspects of identity, like sexuality, gender, ability and race, also means that the spaces I have moved through in my life have presented me with more opportunities to build strong connections with other socially-dominant, rather than with marginalized, people. Some of the work of learning to see ourselves as responsible, particularly in the context of settler colonialism, we would be able to do together. But meaningful differences among us do exist, so we would also

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31. Cukier et al., "Diversity and Skills Shortage," 7.

have to learn to understand the ways in which social hierarchies can play out even among friends.

5.9   End with energy

In preparation for organizing the workshop, following the advice of my supervisor, I had piloted two shorter learning activities for two CS-related reading groups I attended at McGill University. The first group is focused largely on computer science pedagogy, and in the summer I organized a learning activity for us, it was attended by CS students, instructors, TAs, professors and others interested in the theory and practice of teaching and learning CS. I had organized a series of short, connected activities for the hour we would be meeting. Much like I had wanted the workshop participants to understand that technology is political, I wanted to have a discussion in the reading group about why *education* is political.[32] The different activities lead us into having that discussion, but by the end of the hour, most of us felt deflated, sad and hopeless about the state of education and the possibilities for change. I remember that the energy I had put into organizing the learning activity and had brought with me into the room dissipated into apathy by the time we finished.

A similar thing happened during the second pilot, this time in a reading group focused on the social, historical, political, philosophical, cultural and economic contexts that define, and that are defined by, computer science. I had just recently returned from the Decolonizing Conference at the University of Toronto,[33] and in the spirit of starting a conversation about settler colonialism that may lead into possible paths towards decolonization, I organized a loosely-structured discussion about the land upon which our reading group met. Our discussion engaged just about everyone in the room, to various degrees and towards various ends, but again I sensed a collective apathy and powerlessness as we left the room.

One possible reason both pilots had put most learners in a place of helplessness is that one hour for the learning activities wasn't enough time. We only had enough time to start difficult, complex and uncomfortable discussions, not also to begin connecting our learning to possible political action. Another reason is that I also didn't organize the activities to lend themselves to deliberations of action, which may have energized us, maybe even helped us build some hope.

Learning from the experiences of these pilots, I thus wanted to end the workshop in a more active way, so that we may leave the room with more energy and more hope than we came in with. But it would be dangerous to move into action too quickly. Without an honest engagement with theory – and especially with people and communities not present in the room – action for the simple sake of it would likely do more harm than good. I did not therefore plan for us to develop concrete action plans during the workshop, but instead to

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32. For more on why this is so, see chapter 4.
33. I write more about my experience attending this conference in chapter 8.

brainstorm possibilities for action. I hoped that even merely thinking about possible actions would help the participants understand that they are capable of living more responsibly – and that that responsibility must not be delegated but embraced. And I hoped that this would help us create enough energy and enthusiasm among us all so that we would encourage one another to continue our learning, and to be more politically active in our day-to-day lives.

5.10 Exercise

For this exercise, set aside 20 to 30 minutes, then think about each of the following questions. If it helps you, consider writing down your answers or having a conversation about them with a friend.

1. Make a short list of technologies you work on or rely on in your day-to-day life, then pick the one you find the most interesting.

2. If you can think of the technology you picked as a 'thing,' think about the following questions. If there are questions you don't know how to answer, that's OK – just make a note of them and continue to the next question.

    (a) What is it made of?

    (b) Where did the materials it is made of come from?

    (c) What kind of work was required to gather those materials and to turn them into the finished product?

    (d) Who did that work, where, and what do they think about it?

    (e) What else is required to make this technology useful besides the thing itself? For instance, if you're thinking about a pressure cooker, you may think of the energy required to power it, the recipe books or websites that teach you how to use it, or the raw ingredients you cook with.

3. If you can think of the technology you picked as a 'skill' or a 'practice', or if it requires particular skills or knowledge to be useful, think about the following questions. If there are questions you don't know how to answer, that's OK – again, just make a note of them and continue. If there are questions that aren't applicable to the technology you picked, feel free to skip them.

    (a) How did you learn this skill or become initiated into the practice?

    (b) What resources, abilities or other skills or knowledge did you need in order to learn it?

    (c) What social groups have easier access to those resources? What social groups have harder or no access to them?

4. As far as I understand, to say that something is 'political' is to say that it embeds or expresses certain ideas about what is valuable in society, what is desirable for the future, and who gets to decide those things. Considering this interpretation of the word 'political,' what are the political implications of your answers to questions 2 and 3?

5. If there were questions you didn't know how to answer, come up with three things you can do that will help you begin to answer them.

Chapter 6: Organizing the workshop

In the years I taught computer programming I had been involved at every stage of more traditional educational processes, from designing curriculum, to preparing and delivering lectures, to working one-on-one with students to level-up their skills, to designing, administering and reflecting on student evaluations. For the most part, my teaching of computer programming was a patchwork of techniques and philosophies picked out from my memories as a student, adapted from advice I sought from more-experienced teachers, and a smidge developed from the ideas and critiques computer science educators wrote about on their blogs.[1] Looking back, my approaches were firmly rooted in liberal educational approaches, themselves built upon liberal philosophies. What I mean by 'liberal' here is that all my educational efforts were geared towards providing politically neutral and historically decontextualized teaching to individual, self-directed learners looking for personal growth. In contrast to more critical or transformational educational approaches, and despite making an effort to provide the best possible teaching that I could, I did not frame my teaching in ways that pay attention to history and to the power dynamics between different social groups, or that encourage social and political change.

Aside from two short learning activities I piloted at McGill University and that I write about in chapter 5, I therefore had no experience organizing educational events based on principles of transformational education. While the workshop goals had mostly emerged from theoretical and philosophical engagement with scholarship – as much by reading it as by discussing it and working to understand it with others – theory and philosophy do not translate directly into action. To organize the workshop, then, I turned to scholarship that was more practically oriented.[2]

What would bring the participants and I together the day of the workshop was not only our shared histories, but also, to some degree, our shared concerns about tech. In the invitations I sent out, I framed the workshop as one in which we would come together to discuss what most concerned us in/about tech. Wanting the workshop to be led by the participants, I included in these emails a link to an editable document where we could all brainstorm our concerns. Rick Arnold and his colleagues write that "a paradox in democratic education practice [is] that before you can successfully give over control to the participants, you need to establish your credibility" as the facilitator.[3]

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1. A special shout-out here to Mark Guzdial's blog, https://computinged.wordpress.com/. Discovering that blog, and especially struggling to adapt what I learned from it in my own teaching, had been an influence in my decision to return to grad school. (Once here, as this thesis evidences, my work changed direction – learning, to me, has often been an unpredictable process.)

2. I got the most use out of the following: Arnold et al., *Educating for a Change*; Barndt and Freire, *Naming the Moment*; CU-SEI and CWSEI, *Using Effective Learning Goals*; Suessmuth, "How to Use Questions Effectively."

3. Arnold et al., *Educating for a Change*, 48.

6.1 Establishing my credibility

I wanted it to be clear that participant-led did not mean I wasn't going to be prepared, nor that I had nothing to offer the participants. I therefore started the brainstorming process, sharing several of my own concerns in/about tech, as a way to demonstrate that even while we were going to focus on the issue(s) that concerned us most as a group, I nevertheless had put lots of thought into the workshop.[4]

At first, my idea had been to use the brainstorming document as a guide for how to frame the workshop. But as the workshop neared, I realized that it couldn't stand in for discussing our concerns in/about tech when we all met in person. That was partly because I figured it would be more productive that way, and partly because not everyone was getting the workshop invitation at the same time and I worried that we wouldn't all have a fair chance to contribute to the brainstorming document before we met. I decided, therefore, to move this brainstorming into the workshop itself.

6.2 Setting the workshop agenda

What follows is the complete agenda I eventually settled on (and kept visible during the workshop so participants could refer to it):

1. Introductions (25 mins)

2. What does technology mean to me? (15 mins)

3. Our biggest concerns in/about tech (20 mins)

4. Presentation (20 mins)

5. Break (15 mins)

6. Supports and obstacles (75 mins)

7. Wrap-up (10 mins)

6.3 Acknowledging the land

I had set aside twenty-five minutes for introductions because it would be a crucial time during which I would set the tone and begin establishing trust with the participants, and also because I wanted to begin with a land acknowledgment. Much has been said and written about land acknowledgments and both their potential and inability to contribute to decolonizing projects.

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4. For the list I shared to start our brainstorming process, see Appendix A.

Chelsea Vowel writes, for instance, that a land acknowledgment can have a meaningful impact if it's disruptive to the business-as-usual (aka colonial) attitudes and actions of those hearing it. But she goes on to say that this can happen only "as long as these acknowledgments discomfit both those speaking and hearing the words. The fact of Indigenous presence should force non-Indigenous peoples to confront their own place on these lands."[5]

Printed in the program for the Decolonizing Conference I attended in November 2018, were Eve Tuck and George J. Sefa Dei's takes on land acknowledgements. Eve tuck writes that

> Acknowledging land is important to do in settler societies because these societies otherwise only consider land as property. But more important is to acknowledge the relationships to land that Indigenous peoples as specific peoples have engaged since time immemorial. To acknowledge land at the start is only a start, but a necessary start to any gathering that hopes to be responsible to Indigenous peoples' meaningful and ongoing relationships to land.[6]

And George Dei adds that

> By acknowledging the Land, we show humility and appreciation for the magnanimity of the peoples on whose Indigenous Land we have come to reside. Such acknowledgement expresses a readiness to receive the teachings of the Land/Mother Earth, to understand our connected histories and struggles as well as to think about our collective implications and responsibilities.[7]

I had heard many land acknowledgments before reading the above texts (and even recited a few myself). But it wasn't until I read them in the context of the Decolonizing Conference – which began with an Anishinaabe opening ceremony that brought the land into the room and into our minds, and where nearly every talk opened with a land acknowledgment – that I began to see an extra power they hold: to expose settler relationships to land as based on property, and to teach more humble and more spiritual relationships to land.

6.3.1 Critiques of land acknowledgments

Despite the potential for land acknowldegments to expose and confront the colonial status quo, they *cannot be said to be decolonizing on their own.* That would require more than thoughts and words and discomfort – that would require the repatriation of the land being acknowledged. This important distinction can often be missed, or worse, obscured, when land acknowledgments do not shake up business as usual but become little more than exercises in political correctness. In the book *Exalted subjects*, in which Sunera Thobani exposes the racist

5. Vowel, "Beyond Territorial Acknowledgments."
6. Centre for Integrative Anti-Racism Studies, *Decolonizing Conference 2018 Program*, 4.
7. Centre for Integrative Anti-Racism Studies, *Decolonizing Conference 2018 Program*, 4.

logics masked by Canadian multiculturalism, she has this to say about how the ideology of multiculturalism intersects with Indigenous claims to sovereignty:

> With its emphasis on tolerance and diversity, multiculturalism has discredited Aboriginal claims to special status as the original inhabitants of the land; Aboriginality is instead devalued as only one among several cultures that needs to be harnessed for the cultural enrichment of nationals.[8]

Applying her insight to settlers making land acknowledgments in settler spaces – which would be the case at the workshop – there's a risk the words would not disrupt the settler-colonial status quo, but instead strengthen it by constructing settlers – us – as 'woke' and politically correct. The risk is that they might allow us to do nothing about our settler status on these lands while simultaneously making us feel good about being knowledgable about Indigenous decolonial struggles.

Hayden King, who spoke to the CBC about his regrets in writing Ryerson University's territorial acknowledgment, seems to agree.[9] He argues that guides to making land acknowledgments absolve non-Indigenous peoples of the responsibility to learn about the land they occupy and about the peoples that have taken care of that land since time immemorial. And when that's the case, he believes such guides "effectively [excuse settlers] and offers them an alibi for doing the hard work of learning about their neighbours and learning about the treaties of the territory and learning about those nations that should have jurisdiction."[10]

Nevertheless, my goal to lead us towards decolonizing and undoing the relations that are continuing the genocide of Indigenous peoples on Turtle Island meant we had to engage with our status as settlers on these lands. From my standpoint as someone engaged in scholarship on settler colonialism on a near daily basis, land acknowledgments no longer hold the discomfiting power they once did. However, in the context of the workshop, because I believed most participants would have so far engaged in decolonial struggles only in small or partial ways, I hoped a land acknowledgment would have some of the power Vowel, Tuck and Dei write about. I looked, then, for a way to acknowledge the land we would meet on that would make us uncomfortable, that would make us more aware of how little we know about our positions as settlers on these lands, and that would challenge us to learn about and confront the structures we draw privileges from.

6.3.2   My approach to acknowledging the land

The space I had booked for the workshop was at Simon Fraser University's Harbour Centre campus, located on land that includes the territories of the xʷməθkʷəy̓əm, Skwxwú7mesh and

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8. Thobani, *Exalted Subjects*, 174. Note that Thobani uses the term 'Aboriginal' where throughout this thesis I have used 'Indigenous.' For a quick overview of some of the differences between the two terms, see The University of British Columbia, *Indigenous Peoples*.

9. The CBC is the Canadian Broadcasting Corporation, a publicly funded media institution.

10. Deerchild and King, "'I regret it'."

Tsleil-Waututh nations/communities[11] [12] – commonly (and not unproblematically) referred to as 'Coast Salish' peoples.[13] I had attended elementary, secondary and post-secondary schools on Coast Salish territories but never once in all that time did I learn anything about what that means. Preparing for the land acknowledgment, therefore, I would have to start nearly from scratch.

After putting together a land acknowledgment text, largely borrowed from SFPIRG,[14] I showed it to my partner who immediately identified it as too academic and too distant. This was a serious concern. If the land acknowledgment would come off too academic, it might implant itself in the minds of the participants as a problem for 'the experts' to figure out. And if it would come off too distant, it would risk allowing us, as settlers, to distance ourselves from the structures of settler colonialism. My partner's advice was that I tell a story instead, that I "speak from the heart" and make the land acknowledgment personable, that I connect it to our lives. This was good advice – but what story to tell, when I knew very little about the Coast Salish? And how to tell it as a settler?

Clearly, to speak from the heart did not mean to wing it. I spent several days looking for resources to learn about the Coast Salish peoples, their relationship to land and their worldviews. I realized during that research that heeding the call to learn about the Indigenous peoples whose traditional territory I live and work and play on was a different task than engaging with theories of settler colonialism – and that there was, and is, very much left for me to learn. I also relearned during that time, as Judy Iseke-Barnes puts it, "that knowledge of indigenous peoples must be learned in relationship with the people as reflected in history and culture of the people."[15]

Unfortunately, my particular social location has contributed to my not having yet developed strong relationships with Indigenous communities. Doing so was going to have to remain a longer-term goal; for the time being, I continued struggling in my search for a story to tell.

That did not happen until the mostly sleepless night before the workshop. Earlier that day I had been watching TV with my family. The news was on. One of the segments was about how the 'Lower Mainland' region of so-called 'British Columbia' had had a lot of rain the previous days.[16] The story focused on the destructive force of nature, and the language the newscasters and reporters used to refer to nature's actions was violent: rain "battered" the city; storms "destroyed" landmarks and property; residents "feared" the possible coming of

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11. xʷməθkʷəy̓əm is also commonly written as 'Musqueam' and Skwxwú7mesh as 'Squamish'. For how to read hən̓q̓əmin̓əm, the language spoken by the xʷməθkʷəy̓əm community and the Tsleil-Waututh nation, see http://www2.moa.ubc.ca/musqueamteachingkit/alphabet.php.

12. This territory is also known today as downtown Vancouver.

13. The term 'Coast Salish' originated in anthropology and is therefore more often used by settlers than the communities/nations themselves. See The University of British Columbia, *Indigenous Peoples*, 8.

14. SFPIRG is Simon Fraser University's Public Interest Research Group. For their materials on land acknowledgments, see https://sfpirg.ca/acknowledgement-of-indigenous-territories/.

15. Iseke-Barnes, "Aboriginal and Indigenous Resistance," 185.

16. The 'Lower Mainland' is a region that encompasses the city of Vancouver and its surrounding suburbs.

further storms and more rain. Lots of attention was paid to how nature had damaged (settler) property and inconvenienced (settler) economic activities. In order to prevent or mitigate this sort of 'harm' in the future, the reports turned to the 'governing experts' for their proposed solutions. Settler politicians promised more money spent to manage and contain nature, and city planners and engineers spoke of how they would prepare the cities for quicker responses to 'inclement' weather so that nobody would need worry about not being able to go to work or to the mall.

This news story, it struck me as I lay awake, was in strong contrast to one I had come across on YouTube earlier that week. That had been a story told by Alec Dan of the xʷməθkʷəy̓əm community about how his people got their name.[17] I encourage you to watch the video for yourself, so you may hear the story as he tells it directly, but I will briefly paraphrase it here. xʷməθkʷəy̓əm means "people of the river grass," Dan says. Telling the story in the staləw delta near c̓əsnaʔəm,[18] Dan speaks of how long ago, a giant serpent used to travel over the land, shaping the different arms of the river. As it slithered across the land it left a poison behind, from which, later, poisonous grass had grown. (This grass is now gone, a direct effect of colonialism.) Children would play along the bank of the river, Dan says, and this poisonous grass would make them sick. In response, his people prayed to χe:ɬs,[19] who answered their prayer by giving the grass a flower – now, the children would know which grass was poisonous, helping them avoid it as they played. This grass is called məθkwəy̓ – and xʷməθkʷəy̓əm means "people from where the məθkwəy̓ grows."[20]

I then prepared to tell these two stories at the workshop, the one from the news, and Alec Dan's. Both were stories about the power of nature to cause harm to humans. However, the former was about how settlers were upset when they could not control nature, and what they would do to (try to) exert more control over it in the future. In the latter story, the xʷməθkʷəy̓əm did not place themselves above the grass in importance, and looked not for a way to control the grass, but for a way to live in harmony with it. And given that for the settler city engineers nature posed technological problems, I hoped we might find some connections between these two stories and the rest of our discussions that day. My hope was that we would continue to engage with the structures of settler colonialism beyond the land acknowledgment by understanding that the purposes or applications we imagine for technology can all to easily align with settler-colonial projects.

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17. Owens, *How Musqueam Got It's Name*.

18. staləw was dubbed by settlers as the Fraser River, and c̓əsnaʔəm is a village and burial site between 2500 and 5000 years old in what today is also known as the Marpole neighbourhood of Vancouver. See Musqueam First Nation and UBC Museum of Antrophology, "xʷməθkʷəy̓əm: Musqueam: An Introduction," chapter 1.

19. Alec Dan calls χe:ɬs the Creator. The xʷməθkʷəy̓əm community website also refers to χe:ɬs as 'the transformer' (see https://www.musqueam.bc.ca/our-story/who-we-are/).

20. Musqueam First Nation and UBC Museum of Antrophology, "xʷməθkʷəy̓əm: Musqueam: An Introduction," 8.

6.3.3 Paying attention to the complex histories of Indigenous territories

The attentive reader will have noticed that I mentioned we would be meeting on land that included the territories not only of the xʷməθkʷəy̓əm, but also the Skwxwú7mesh and Tsleil-Waututh communities/nations. Khelsilem warns that settlers, by not doing their due dilligence, can interfere in territorial disputes between Indigenous nations, making a mess.[21] This was something I had tried to keep in mind while preparing for the workshop, but in my excitement at finding a story to tell in the acknowledgment of the land – especially one I could connect to technology – I forgot about this warning. At the workshop I did acknowledge the Skwxwú7mesh and Tsleil-Waututh nations, but by my telling of Alec Dan's story about the məθkwəy̓ I may have carelessly foregrounded the xʷməθkʷəy̓əm's claims to the territory. While I believe the story I told was more powerful than reciting a land acknowledgment, this is a problem I must avoid in the future.

6.4 Guidelines for learning in community

A discussion of our settler relationships to the land and our locations within the settler-colonial relations would be easier to engage in if we knew each other. I had prepared, therefore, not to immediately start with the land acknowledgment. First, I had set aside time to introduce ourselves – sharing names, where we worked, and why we were attending the workshop. In my introduction, I also spoke about my motivations for organizing the workshop, about how it was structured to challenge notions of expertise common to traditional education, and about how we may find it challenging to understand ourselves as knowledgable and capable of addressing political problems ourselves.

This would take time for us to learn. To give us a head start, however, I shared a list of guidelines for learning in community. This written list was hung up in the workshop space for reference, and before moving on to the land acknowledgment I shared them with the group:

- Speak authentically
- No question is ridiculous
- Intend no harm
- Honour each other's words and truths
- Honour silence
- Honour all emotions – including anger
- Embrace discomfort

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21. Khelsilem, "Tips for Acknowledging Territory."

These guidelines I borrowed and adapted from Philip S. S. Howard, who shared them with my classmates and I at the beginning of two courses I attended at McGill University (Critical Influences on Educational Praxis, and Critical Race Studies and Education). The guidelines are similar to those one might find in lefty collectives and organizations, and that are said to create safe spaces for dialogue. However, as Howard encouraged us to learn over the course of those two classes, simply calling a space safe doesn't make it so. Two particular readings he shared with us to deepen our understandings speak to why that's the case. In her struggles with/against critical pedagogy, Elizabeth Ellsworth exposed that the ideas of critical pedagogy rely on students and teachers being "fully rational subjects."[22] This is problematic, she argues, because the idea of the 'rational subject' has been defined in opposition to 'irrational' others – such as women and racialized peoples. Indeed, even the idea of the *subject* has been defined in opposition to those not deemed to qualify as such. As Rinaldo Walcott explains, "[what] it means to be Human is continually defined against Black people and Blackness."[23]

Howard shared the above guidelines for learning in community with these critiques in mind, and then guided us over the course of entire semesters to deeply engage with such critiques and to work at undoing dominant (and dominating) ways of thinking and being. I knew, of course, that we wouldn't have the time for that in the workshop. Still, I hoped the guidelines would raise some eyebrows, spark some questions and perhaps lead to further learning down the road. The important ideas for myself to keep in mind, as the workshop unfolded but indeed at all times, are the insights gleaned from critiques such as Ellsworth's and Walcott's, and the world-building aspirations of the guidelines. Ellsworth expresses her starting point for engaging in dialogue for anti-oppressive purposes like this:

> If you can talk to me in ways that show you understand that your knowledge of me, the world, and 'the Right thing to do' will always be partial, interested, and potentially oppressive to others, and if I can do the same, then we can work together on shaping and reshaping alliances for constructing circumstances in which students of difference can thrive.[24]

That is to say that I had to keep in mind that I myself, as a 'critical pedagogue,' am not impartial, and that my starting point for entering into dialogue and partnerships with others is to acknowledge the way I am implicated in the oppressions of others, possibly (if not likely) in their particular oppressions.

I hoped, then, by sharing the guidelines, that they might offer a first step in coming to understand the ways that many knowledges are subjugated, and that to create the space they need to to thrive means the necessary critique and dismantling of dominant ways of teaching, learning and engaging in dialogue.

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22. Ellsworth, "Why Doesn't This Feel Empowering?," 301.

23. Walcott, "Problem of the Human," 93. Note that he capitalizes the word 'Human' to refer not to humans as beings, but to how 'Human' has been defined in (anti-Black) European philosophy.

24. Ellsworth, "Why Doesn't This Feel Empowering?," 342.

6.5   The learning activities

The rest of the activities followed an incremental logic in the way I had organized them. We would start with a Think-Pair-Share activity to discuss what technology meant to us. This was a to be warm-up that started solo, then moved through working in pairs before bringing the whole room into conversation. The goal was to begin questioning our understandings of what technology is as we moved into brainstorming our biggest concerns in/about tech. I had planned a presentation to follow that, during which I would make the case for why technology is political, much like I did in chapter 5. Following the advice in *Educating for a Change*, I placed the presentation in the middle of the program so that it can easily be skipped if earlier activities took up more than the allotted time.[25]

After a scheduled break complete with snacks, we would begin the longest activity of the afternoon. This activity I called 'Supports and obstacles' and I modelled after a similar one, also borrowed from *Educating for a Change*.[26] In order to meet my goal of ending with energy, this activity was one in which we would choose, as a group, which of the issues we brainstromed earlier concerned us the most as a group. Then, we would come up with factors that support the solution of the problem, as well as factors that contribute to the problem or pose obstacles to its possible solutions. I had an idea of what potential problems we might end up looking at more closely during this activity, but I could not directly plan for them as they would emerge in the room. Still, I knew that all problems could be (and would need to be) connected to structures like settler colonialism, so I prepared a list of questions to help draw them out. My hope was that we would begin to analyze these structures in our discussions, as well as understand that there is much more we need to learn before we can honestly contribute to their undoing.[27]

We would the activity by sharing the various factors we identified in the small groups with everyone else, categorizing them as obstacles, supports or both. This was to determine, together, whether a factor brought up by the small groups was an obstacle to solving the problem, whether it supported us in solving the problem, or whether it could potentially be doing both. In order to help uncover possible actions and to create enthusiasm and energy, we would discuss how items categorized as 'both' might be made more into 'supports,' how 'obstacles' might be undone, and how we might be able to strengthen existing 'supports.'

Finally, we would end the workshop, having hopefully built some new relationships, new thoughts and analyses, and some momentum, by briefly discussing what next steps (if any) we may be interested in taking as a group.

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25. Arnold et al., *Educating for a Change*, 146.

26. Arnold et al., *Educating for a Change*, 85-86.

27. For the handout I prepared with these questions, see Appendix B.

6.6 Scrambling for accessibility

In the last week or so before the workshop was to take place, it struck me that I had not made it a goal to create a radically inclusive space. I had thought about building and strengthening community among the participants as well as building accountability relationships with communities not present in the room, but a community that I did not consider almost the entire time I was planning the workshop was the disability community. This means I did not begin to directly plan for accessibility until too late in the the process of organizing the workshop. Before realizing I had forgotten accessibility as an important concern, however, I had nevertheless taken certain steps that could be seen as meeting some accessibility needs. I had:

- Been careful to use language that my participants would understand

- Planned activities that would meet learners where they are

- Set the time for the workshop together with participants, to make sure they could attend

- Picked a place for the workshop that was easily accessible by public transit, and that was close to the participants' workplaces (we were meeting on a working day)

- Ordered snacks that would be suitable for a variety of diets (such as vegan and gluten free)

Then, with only about a week left before the workshop, I tried my best to correct my oversight. In doing so, I discovered that I did not have enough knowledge about how to make the learning space more accessible. I did not immediately know what to pay attention to, and I had a hard time finding good resources because I wasn't sure what to look for and I especially had no way of telling what I might be missing. However, I was able to make some late adjustments to the workshop plan. At the last minute, I:

- Emailed all participants ahead of the workshop to let them know that the event would be scent free

- Reached out to participants I remember having worn perfume/cologne in the past to talk to them about the scent free policy

- Ran through scenarios in my head about what I would do if someone arrived disregarding the scent free policy (willingly or not)

- Booked a room for our meeting that was wheelchair accessible, that had blackboards (as opposed to whiteboards, the markers for which are often not odourless), and that had natural lighting

- Called the university campus where we were meeting to make sure the room I was booking had not been recently painted or had not undergone construction work that may have left chemical odours lingering

It's probably better I did all this at the last minute than not at all. Still, might it be that by not starting with the goal of making the workshop radically inclusive, that certain people did not attend? Some may have received my invitation but declined to attend due to accesibility concerns. Others I may have overlooked entirely. By forgetting about accessibility there may have been people I didn't even think of inviting in the first place, and whose presense may have shifted the way the workshop unfolded.

6.7 Exercise

What questions do you have after having read this far in the thesis? Come up with at least three questions. These may be questions you ask for clarification, to explore an idea further, to wonder about how an idea connects to your own experiences or your day-to-day life, to prepare for conversations with friends or other members of your communities, etc.

I recommend you do this exercise on your own so you can feel safe asking any questions you may have. I also recommend you write the questions down – writing them down will help you think more specifically about what you would like to know or to learn.

Chapter 7: Why I'm not reporting on what happened at the workshop

If you've been wondering, as you've been reading the last several pages, how all that preparation played out during the actual workshop, I'm afraid I'm going to leave you disappointed. I am intentionally leaving that out of this thesis. In preparing for the workshop, I never imagined I would be writing about it – instead, I thought about the workshop, and still do, as political organizing. Indeed, I made the deliberate pedagogical decision not to use it as a data collection process.

My goal for the workshop was to begin a journey together with friends and colleagues in the tech industry towards the decolonization of Turtle Island and the abolition of anti-Blackness. That work is difficult enough as it is. To have dragged the participants through a McGill-approved consent process so that I may use that political work for research purposes would have distracted from the goals, caused unneccesary stress for the participants as well as for myself, and perhaps limited the effectiveness of our collective learning. Because I worried participants might self-censor themselves if their words and actions could be printed in this thesis, or even avoid attending the workshop in the first place, I decided not to use our collective experiences as data for a research project.

I do believe the research community could learn from our experiences, and that some of the pedagogical content knowledge I have presented throughout this work might be stronger if I reported on the workshop. However, more important for me than the usefulness of this thesis to researchers, are the relationships between the workshop participants (myself included).

7.1 Ongoing relationships as the metric of research success

As Lisa Nathan and her colleagues put it, in reflecting on the software and research projects they worked on with Indigenous communities, one part of addressing colonialism means that we need to judge the success of our projects by the nature of the relationships we develop.[1] One of the projects Nathan and her colleagues worked on in partnership with an Indigenous community resulted in a public museum exhibition, but their community partners did not approve the use of the data collected during that process for any research purposes.[2] The researchers therefore deliberately destroyed all the collected data and refrained from analyzing or writing about the project (except what was already made public by the community,

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1. Nathan et al., "Good for Whom?"

2. Notably, this lack of approval was not explicit; rather, the researchers followed a community protocol for proposing a research collaboration but never received an answer from the community. The researchers are humble in their awareness that Indigenous communities often face much more pressing needs than collaborating on research projects.

like the museum exhibition), yet they nevertheless considered the entire project successful because the community partnership was ongoing.[3]

The lessons that can be learned from the way the workshop unfolded are therefore secondary to the relationships the participants may wish to cultivate. And for that reason, whatever lessons can be learned from the workshop, I would hope they would be learned in ongoing dialogue with and between the participants. Through the processes of organizing and facilitating the workshop, of writing this thesis, and of sharing drafts of my writing with some of the workshop participants, I learned that physical presence is important for ongoing dialogue and for maintaining relationships. But I also learned that a written document – such as, but also specifically, drafts of this thesis – can nevertheless spark learning and dialogue even across great distances. I therefore wrote my story primarily for the workshop participants, hoping that it can offer insights and contribute to further learning for us all, and hoping also that engaging with this document together would encourage our relationships to keep growing. The next chapter is a more detailed account of the goals I set myself for writing this thesis, as well as of the struggles I faced in trying to meet them.

7.2   Exercise

Take a few minutes to think about each of the following questions and prompts. If it helps you, consider writing down your answers or having a conversation about them with a friend.

1. How might software projects be developed if, as Nathan and her colleagues suggest, relationships between developers and users were a measure of their success?

2. Are you creating software *for* other people, or *with* them? What might be different between these two approaches in the software development process?

3. Come up with three things you can do to begin or to further the goal of making software development, design and deployment more of a partnership between creators and users.

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3. Nathan et al., "Good for Whom?," 5-6.

Chapter 8: Writing this thesis

Writing this autoethnography has been a constant struggle. Despite my supervisor Elizabeth's earnest assurances and reassurances, along the entire protracted writing process I had to keep my many doubts at bay. I had to train myself to write despite my hang-ups, to exercise a faith that a story would emerge as I kept writing. And in the end, with Elizabeth's help, one did. In this chapter I write about how I wrote that story, because writing about the writing process is an important part of the critical research process more generally. Critical research write-ups should offer readers as much detail as possible about the entire research process – *including writing about it* – so that readers can understand what standpoint and perspective are embedded in that research.

From my experience in grad school, almost all academic writing follows some logical progression. Often, and this is true about this thesis as well, that sort of writing builds up to its central arguments or insights in a linear way. And that seems to make sense – it's hard to draw connections between theories or between theory and lived experience until you've presented the theories and detailed that experience first. But linear expressions of non-linear things are bound to be, at best, useful or helpful approximations, and at worst, deceptive or unreliable reductions.

My personal story of unlearning the technical renderings of computer science and of learning to become responsible has been – and continues to be – non-linear. These are both reflexive, circular processes that benefit from patient repetition, that engage my entire being, not just my mind, that thrive on serendipity, and that are hard enough to hold on to in my heart and in my mind, let alone to capture in my writing. On the one hand, the challenge has been to distill messy experiences, with all their contradictions and open questions, into words, sentences and chapters; on the other, it's been hard to resist tearing all those sentences apart, because once they're written, they come off as too sure of themselves and too definite – much more so than the experiences they're meant to explain. Yet as hard as it is to tell that story well, an even bigger and ongoing struggle is trying to answer for myself whether telling that story in this way – that is, as a thesis that earns me a graduate degree from a university whose name still, astoundingly, carries some weight; that is, as a thesis that earns me a graduate degree that commodifies all the learning and unlearning I have done into a marketable degree – whether telling my story in this way does more to solidify my white middle class privileges than to further the goals of decolonization and abolition.

8.1   Asking: Is the university my place?

In November 2018, I attended the Decolonizing Conference at the University of Toronto. Three months later, returning to the notes I kept at the conference, I was transported back to the

opening keynote by Sandy Marie Grande.[1] In her talk, Grande reminded us that the university is by definition a colonial and anti-Black institution, and that decolonization thus requires that we "refuse" the university. "Refusal is a condition of possibility," she said, challenging the liberal idea that it's possible to outweigh the 'positive' aspects of the academy against the 'negative.' No – the university, as an institution, must be refused altogether.

The radical words she spoke clashed with those printed on enormous posters hanging from the walls of that lecture hall. ("WITH OISE [Ontario Institute for Studies in Education] I CAN ACHIEVE ANYTHING!" and "EXPLORE" and "ADVANCE MY CAREER," the posters shouted in big, bold, confident capital letters.) Her listeners, myself included, were largely academics – as is Grande herself. These contradictions were not lost on her. Addressing them, she conceded that there could be various important reasons why the university may currently be someone's place. Her advice to us, should that be our situation, was to "try to be as much *in* but as little *of* the university" as possible.

I sat with Grande's words for several days. In a journal entry during that time, I wrote about how I couldn't see the university as my place:

> Taking seriously the call to refuse the university as well as to reject the temptation of justifying my presence within it by the 'good' I may do from here, I'm struggling to find an argument in favour of the university as my place. A member of the audience, entering into conversation with Sandy Marie and her talk, said that "part of decolonizing means letting our heart lead our mind." Well, my heart's telling me this isn't my place. My mind wants to complicate that answer, and it's only this push-and-pull between heart and mind that keeps me here, enrolled at McGill.

My heart was telling me, and still tells me as I write this, that earning an MA degree will do more to bolster my middle class privilege than to further the projects of decolonization and abolition. Many non-academic community organizers, educators and activists, who put on workshops on a regular basis, don't gain degrees from their work. And so I ended that journal entry with a question I'm still asking myself: "Why not walk away right now, without giving myself the option of leveraging a Master's degree into 'better jobs' or 'safer futures'?"

Well, I'm still here. Writing, worrying, wondering. I don't know if I could answer why, at least not in an honest way. I might say that were I to decide to quit school, my decision would affect more people than just me. I might also say that we live in these institutions whether we like it or not, and being able to navigate them might, maybe, make more of a difference in the long run. Or maybe I could tell you that if I were to walk away from the university, I wouldn't know where else to turn to that isn't colonial or anti-Black – and so I would be faced with more-or-less the same struggles there too. What I can say with certainty, though, is that

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1. See http://decolonizingconference.com/schedule for the conference program.

sitting with Sandy Marie Grande's words, and returning to them again and again, continues to push me to look for ways to contribute to decolonial and abolitionist projects, right here and right now.

8.2   My goals for this thesis

My here and now over the last year has been the university and working on this thesis. Struggling with Grande's words in all that time has meant that I do the best to write and work on my thesis in ways that contribute to decolonization and abolition. Early in the writing process I came up with the following list of goals for this thesis, a list I have returned to and revised many times along the way.

- I want the thesis to be entertaining to read. Not a page turner, but engaging enough for a non-academic audience to want to read it (or, at least, parts of it).

- I want the thesis to be accessible to non-academics, in particular to folks working in or associated with tech. In other words, I want it to be useful and valuable to the workshop participants themselves. I want to write using simple language without simplifying complex subjects (and I expect I will need to push, pull, stretch and bend more traditional thesis structures in order to do this).

- I want the thesis to offer my learning journey in unison with social theory so that readers may learn from my experiences. I want to do this in a way that the story doesn't lead to catharsis for the readers, but rather encourages them to do something as a response to their engagement with the work – even if that only means thinking or being reflexive. I want the narrative arc not to end in resolution or in a sufficiently satisfying 'Future Work' section, but to be a challenge, to create radical possibility.

- I want to write the best thesis I possibly can, but to remember that it's nevertheless secondary to the relationships the workshop participants and myself will hopefully continue building. I want the thesis to be a catalyst for further learning with my community, but like Nathan and her colleagues suggest, I want the nature of our relationships to be the primary measure of this thesis' success.[2]

- I want the work to be honest, that is, I want to embrace vulnerability as I share my experiences.

- I want the writing to prefigure the world I want to live in. I want to interrupt, to challenge, to destroy settler futurity, to the extent that words can do that.

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2. See Nathan et al., "Good for Whom?" and also chapter 7.

- I want to use the direct voices of marginalized peoples in this work. In my case, this would mostly mean scholars from marginalized social groups, such as Black and Indigenous scholars, women scholars, scholars of colour, queer scholars, and disabled scholars. I want to do this in a way that is more accessible and more engaging than the drive-by citation style common to academic writing. In doing this, I also want to embrace Erica Lagalisse's critique that using the words and experiences of the marginalized "merely as foils to reflect [my] reflexivity" would be to self-make myself as 'woke,' possibly then doing more harm to the projects of decolonization and abolition than if I had done nothing at all.[3] I want to remember that solidarity requires more than words.

- I want this thesis to be more than only critical or reflexive of the fact that the learning journey I will write about has mostly been an individual one. In the same talk at the Decolonizing Conference, Sandy Marie Grande spoke also of how a learning journey aimed at decolonization is not about the self, but about dismantling hierarchies. Perhaps this goal might be better understood in the bigger picture, as in beyond just the writing of the thesis and in my life and work more generally; still, I want to see what boundaries I might be able to push with my writing anyway.

- Finally, I want to do more than speak about my privileges or my understandings of how they are produced and maintained in society. Noel Ignatiev, a critical scholar of whiteness, cautions that the goal is "not to interpret whiteness but abolish it." He speaks of whiteness, but I could say the same thing about some of the other aspects of my identity. I want to write the thesis in a way, again heeding Ignatiev's advice, that would "[defy] white rules so strenuosuly as to jeopardize [my] ability to draw upon [its] privileges."[4]

8.3 Writing for praxis

The above goals all speak to my wish of writing for praxis, not to make knowledge claims. Since well before enrolling in grad school I knew that I had no intention of producing research seeking 'objective' truth. And once in grad school, I realized I also didn't wish to describe or explain social phenomena simply for the sake of describing or explaining. My goal was, is, social and political change.

I therefore had no interest in writing primarily (let alone exclusively) for academics. The work of organizing and facilitating the workshop, the nucleus around which this entire thesis revolves, I did for its own sake. It was an act of political organizing, indeed, in the weeks after the workshop I still didn't imagine I would end up (somewhat) reporting on it for (other) academic elites.

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3. Lagalisse, "'Good politics'," 392.
4. Ignatiev, "Point Not to Interpret Whiteness," 6.

This was the main reason I did not follow a well-documented and systematic research process oriented towards academic publishing. Writing an autoethnography of my experiences in organizing and facilitating the workshop came up with my supervisor only relatively late in that process, which means that along the way, whatever written records I kept I did because they were directly necessary to the success of the workshop itself.

Still, as you've noticed, I did refer to journal entries, notes, and other crumbs along the paper trail I kept throughout this degree. I don't know why I'm telling you that, though; I'm not convinced that makes this writing any more rigorous, since I didn't use those crumbs in any systematic way. I didn't look for all of them, some of them I ignored, others probably got eaten by birds or hidden away by squirrels. But if you've made it this far, you probably don't need convincing that what I'm doing qualifies as research.

Academic tradition would have it that I also say a few words about autoethnographies. But Emma Goldman once said that if she can't dance, it's not her revolution. If I had tried to write this thesis the 'proper' way, justifying my every decision next to the colonial and anti-Black standards of science imagined as neutral and objective, I would have been wracked with frustration and anxiety. If it reassurres more academically inclined readers, though, I did leaf through several autoethnographies in my writing prep. Spry's was a bit too dense for me, I thought Pelias' was pretty funny, Wall's was helpful and meta in an insightful way, and Duncan's was a reminder of what I'm not trying to do here.[5]

The truest guides for my writing this were Maggie Nelson's book *The Argonauts* and Erica Lagalisse's PhD dissertation.[6] What you're reading now is a departure from an earlier draft where I clumsily tried to follow Nelson's style. It would do violence to the book, though, if I tried to categorize it as an autoethnography, as research, or as academic. (It's all of the above, it's none of the above.) What I borrowed from Nelson was the knowledge that you can write something personal, that engages with theory, that doesn't need to spell everything out but assumes its readers are intelligent, and that doesn't need to follow a rigid or standard format. That's more-or-less what I also borrowed from Lagalisse, only her work also showed me that it's possible to meet many of the goals I had set out for my thesis even in a document that appeases McGill University. (She graduated from McGill the year before I started grad school.) I read her thesis just as I was starting to write mine, and it was an inspiration for me because it was as entertaining as it was insightful, managing to be fun and funny even while it asked its readers to brave dense, thorny thickets of scholarly theory.

In the spirit of thick description, there is one more thread to the story of my writing this that needs weaving. Namely, how this thesis actually came to be. Given my writing goals,

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5. Spry, "Performative Autoethnography"; Pelias, "The Academic Tourist"; Wall, "Autoethnography on Learning Autoethnography"; Duncan, "Autoethnography."

6. Nelson, *The Argonauts*; Lagalisse, "'Good politics'."

I initially spun my wheels trying to tell a story. I started several possible variations, giving all of them up but the last one. My supervisor encouraged me to set the earlier ones aside, alarmed at how few words I had to show for the first several weeks of my ostensibly having been writing. As the first thesis submission deadline loomed, it became necessary to accept that my approach was not working, and so I deferred to the experience of my supervisor.

Heeding her advice, I focused on simply getting the words out. I allowed myself only minimal editing until I filled enough pages to see the story that was emerging. For a little while, what I saw myself shaping threatened to stifle my creativity – it was turning out more academic than I had hoped – but before long I was able to stitch together those freewrites into a workable draft, which I later shared within the university but also with some of the workshop participants. Their feedback, in particular that of my supervisor and the workhshop participants, is what then helped me sculpt my earlier versions into what you're reading now.

8.4 Exercise

Take a few minutes to think about each of the following questions and prompts, and if, like they do for me, they leave you with more questions than answers, take this opportunity to embrace the discomfort of not knowing and the challenge of nurturing an open mind. If it helps you, consider writing down your thoughts or having a conversation about these questions with a friend.

1. "What does it mean to be a good relative?"[7]

2. What does it mean to be a good relative, if we think of relatives not only as our friends and families, but our neighbours, our colleagues, our communities, all of humanity?

3. What does it mean to be a good relative, if we think of relatives not only as people, but *all* that lives and dies on this planet?

4. What does it mean to be a good relative, if we think of relatives not only as what lives and dies, but also, as Zoe Todd suggests,[8] the nonliving, like the rocks and dirt we build our homes with, or the fossilized remains of dinosaurs and algae we burn to stay warm?[9]

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7. This is a question Sandy Marie Grande asked her audience at the Decolonizing Conference.

8. Todd, "On Time."

9. For an example of how to think relationally, see the *All My Relations Podcast* by Adrienne Keene and Matika Wilbur: https://www.allmyrelationspodcast.com/

Chapter 9: A tentative ending

In the academic voice of this thesis, I've folded my experience of organizing a politically-oriented workshop with and for technologists into a telling of how I broke from rendering the world in technical terms, learning – and trying to teach and learn from others – to see the world critically. The language of rendering technical is useful in that telling, but so are the languages of decolonization and abolition; my story is therefore also one of learning – and trying to teach and learn from others – to see myself (also) historically and to become responsible for the life I'm living.

These tellings may offer activist educators and researchers insights into what pedagogical content knowledge can help others walk paths similar to my own. These insights I didn't flag as I shared my story since the primary audience I wrote this thesis for are not educators and researchers but technologists such as the workshop participants. But in hoping to nevertheless be useful, here is a non-exhaustive and non-definitive list of some of the lessons I've learned, and that may make for helpful pedagogical content knowledge (PCK) for critical educators.

9.1   PCK I have learned

- Breaking from rendering the world in technical terms and learning to become responsible are slow, non-innocent, uncomfortable processes.

- Learning is not enough. Learning must take place in tandem with action, or sometimes even take a secondary role to more urgent needs.

- The structure of the learning matters. That is, teaching and learning must be done in ways that pay attention to the hierarchies between teachers and learners, as well as to what social and historical forces shape what is being learned, where, how, why, and by whom.

- Technical renderings of the world are hard to think around. The heroic programmer discourse aligns well with white/male saviourism, and are significant obstacles to any decolonizing or abolitionist work.

- It's dangerous to rush into action without taking the time for careful analysis. However, it's also important to end an educational event with energy so as not to leave learners feeling apathetic and hopeless.

- It's difficult but important to balance your credibility as a teacher with the political need to have the learning emerge from the learners themselves. It's equally difficult and important to meet learners where they are and to challenge them to walk their own paths, but to nevertheless try and determine with the learners which paths are paved

with the blood and bones of marginalized peoples and what other paths may/must be found.

- Difficult learning is made easier by physical presence, and by committed relationships, by friendships.

- It's useful to have references such as the agenda for an educational event accessible to learners in the learning space.

- It's important to respect the learners' time.

- It's important to make the learning accessible to the learners. This includes considerations such as physical and emotional accessibility, dietary concerns if there are snacks/refreshments, and the language used to engage the learners.

- Decolonization and abolition requires more than knowledge of settler colonialism. Also necessary, and in many ways harder to learn, are the details of the specific histories of the peoples tangled up in settler-colonial relations upon the places where we meet.

- Words alone will never decolonize. Still, land acknowledgments are important and can instigate dialogue and learning.

- There can be significant contradictions in trying to teach for critical consciousness and in teaching and learning as data sources for scholarly research.

- It pays off to be prepared. Particularly, anticipating for how an educational event may unfold and running through different scenarios ahead of time.

- It also pays off to pay attention the the social and historical dynamics in an educational space.

9.2   The learning still ahead of me

The learning journey I began long ago, in the moments I started doubting that the world was not quite the way I had been taught to understand it through the technical renderings of computer science, is still ongoing. As I wrote in the first few pages of this thesis, adapting Sherene Razack's words, "unlearning [myself] as modern and coming to understand [myself] as responsible" is a difficult, continous, never-ending process.[1] It is a process that requires, as Sandy Marie Grande insists and that I also continue to learn and re-learn every day, that this learning journey be not individual but collective, aimed not at personal growth but the dismantling of social hierarchies.[2] Part of that learning, I hope, will happen together with my communities; part of it must also happen as I personally continue to narrow the gaps in my knowledge and understanding of settler colonialism and its interlocking oppressions.

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1. Razack, "Race Thinking," 21.
2. This teaching came from her keynote at the Decolonizing Conference. For more on this, see chapter 8.

9.2.1 More to learn: Critical disability studies

As I wrote in chapter 3 and chapter 6, disability studies is a notable gap in my research. My tentative exploration of the links and overlaps between ableism and the structure of settler colonialism, and in particular between the eugenicist logics that inform both, is just a starting point for further learning. Erevelles and Minear find that many critical race scholars unfortunately tend to think of disability as something that only "nuances" other forms of oppression, not as something historically and structurally interlocked with race, gender, sexuality and class.[3] In working towards decolonization and abolition, I therefore need to further and deepen my learning of the ways settler colonialism and ableism work with and through each other. This section is a reminder and a challenge that this work remains to be done. And to start, my supervisor Elizabeth has suggested that some next readings are:

- Davis, *The Disability Studies Reader* (2017)

- Annamma, Connor, and Ferri, "Dis/Ability Critical Race Studies (DisCrit)" (2013)

- Schalk, *Bodyminds Reimagined* (2018)

- Ferri and Connor, "Tools of Exclusion" (2005)

- As feedback to my discussion in chapter 3 of how Canada's bilingualism policies solidified white supremacy, Elizabeth pointed out how these policies privilege *spoken* English and French, thereby marginalizing not only spoken Indigenous languages but also Indigenous sign languages, American Sign Language and Langue des signes québécoise. Some starting points for learning more about this are: Oen, "Indigenous Hand Talkers" (2018), and Snoddon and Wilkinson, "Sign Languages in Canada" (2019)

I also want to share two more helpful resources, both put together by Elizabeth. The first is a collection of YouTube videos offering an accessible introduction to disability studies: https://tinyurl.com/DisabilityYT

And the second is the course outline for a Critical Disability Studies for Education course, to be taught by Elizabeth the semester after I'm submitting this thesis. This outline includes readings, videos, podcasts, social media accounts and other resources for learning more about disability: https://www.cs.mcgill.ca/~patitsas/cds/

9.2.2 Keeping abolition in view

In chapter 6, I gave a detailed description of how I prepared to address the relationship between Indigenous peoples and settlers upon the lands we were to meet at the workshop. Despite anti-Blackness being a pillar of settler colonialism, and despite one of the long-term goals of my work being abolition, I did little to prepare to explicitly address anti-Blackness

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3. Erevelles and Minear, "Unspeakable Offenses," 128.

during the workshop.[4] My focus had been on the racialization of Indigenous peoples and the occupation of their territories. In part, I believe this happened because it is difficult for me to hold multiple forms of racialization in view at one time, despite their interlocking natures. And partly, this likely also happened because I had been sitting with theories of anti-Blackness for less time, and couldn't find a way to meaningfully incorporate a discussion of them into the short time we had for the workshop. This is not an excuse, but an entry point into further reflection and further work. My inability to address anti-Blackness has, as Frank Wilderson puts it, referencing Jared Sexton, turned Black people into "the refugees [of other people's] political projects."[5] In other words, my backgrounding of anti-Blackness as I prepared for the workshop is itself a form of anti-Blackness.

The relationship between the different forms of racialization in settler colonies like Canada points to how decolonization, abolition, or the end of Orientalism cannot happen independently of one another. However, these political projects are not equivalent to each other, and will require different, even contradictory, ways of thinking about and addressing their goals. It's therefore crucial as my work continues that I pay stronger attention to all the logics of white supremacy while simultaneously keeping in view the ways in which they relate. Only then might they be undone.

9.3   Still firmly with the troubles

The nauseating anxiety I left home with the afternoon of the workshop, and that bubbled uncomfortably in my belly as I boarded the Hastings St. bus, metamorphosed into an enthusiastic energy by the time I disembarked. If it really was a fear of freedom I had felt that morning, then embracing that fear and trying to make freedom meaningful was part of what turned nausea into hope. In part it was also that I didn't board that bus alone. As I sat with my friends, words from their conversation caught up with my racing heart and mind and gently reassured me, reminding me of the warm and caring presence of their speakers. And part of it was also that although my thoughts that afternoon were on the violences that propped up all the constructions, physical and ideological, that settlers and their/our ways of living bring into the world, there was more to what was going on around me. I was reminded of this when outside and high above the bus, the clear blue sky that watched over the city, and a dense mass of rain wrapped around the mountains, held each other through a rainbow. Shaping my surroundings were also many ongoing histories of resistance and of remembering and imagining other worlds. Worlds in which, in the words of Donna Haraway, their inhabitants keep

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4. Nor did I prepare to directly address the pillar of Orientalism, but hoped instead that it would emerge in our discussions. I believed there would be less barriers to engaging in a discussion of the logics of Orientalism than anti-Blackness, as Orientalist logics are more commonly explored and analysed in critical takes on technology and the tech industry.

5. Wilderson III, "The Master/Slave Relation," 28.

their eyes and ears and minds and hands firmly in the troubles, while nevertheless working to create possibilities for resurgence and for living and dying well, together.[6]

The workshop was going to be a small step, but maybe, just maybe, it would crack the concrete paving of settler colonialism, allowing a ray of sun and a drop of rain to meet the soil and seed which miraculously, and thankfully, are still alive underneath it all. Of course, I am part of that pavement, and that pavement is also what supports the still-too-comfortable life I'm living. And so, while I hung on to the workshop as a chance to build hope, running through me then were as many unresolved questions as I sit with now, writing down these words. Questions that slip in and out of my consciousness. Questions that meander through my thoughts and feelings, warning against judgment and inviting caution in making answers or actions. Questions that persist, even as I've sat with them for months. Questions that encourage patience and process. Questions that necessarily and urgently unsettle. Questions that produce more questions, more questions than I can share with you in ink or pixel or through the voice of a screen reader.

What responsibilities do we have to the people we encounter on a daily basis? Njoki Wane asked that at the Decolonizing Conference. What responsibilities do we have to our loved ones? To our colleagues, and our neighbours? To strangers we pass in the street? To the man begging for change outside the grocery store? To the the youth sleeping in front of the Tim Horton's? To those far away that I don't know and can't even see or touch, who sweat and maybe even bled to make the clothes I wear or the laptop I'm typing on?

What might it take to fully embrace the necessary chaos required for justice? As Frantz Fanon put it, if colonization is the current order of the world, then decolonization will be "a program of complete disorder."[7] What – concretely, materially, enthusiastically – am I willing to sacrifice?

What are the *specific* colonial histories that brought me here? Rubén Gaztambide-Fernández asked that at the Decolonizing Conference. What will it take to engage with them unflinchingly, no matter what they tell me about my place on these lands?

How do you mourn the loss of lives you never knew, in this age of extinctions and exterminations? How do you mourn when many who hold the very knowledges that might help you see, touch, understand, and communicate with those lives have to fight not to be themselves exterminated? How do you mourn the ongoing destruction, on the one hand, when on the other you are part of it? How do you mourn the ongoing destruction while raging against it, while holding open some space for flourishing?

What other worlds can we imagine together?

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6. Haraway, *Staying with the Trouble.*

7. Cited in Tuck and Yang, "Decolonization Is Not a Metaphor," 2.

Appendix A: Social/political issues in/about tech

What follows are the social/political issues I shared with workshop participants in the form of an editable online brainstorming document when I invited them to attend.

- **How is tech implicated in climate change?**

  – How might we think about tech's ecological footprint?

  – How might climate change be connected to issues of social and structural inequality?

  – What opportunities exist to leverage our skills and knowledge to address environmental issues?

- **What responsibilities and opportunities might we have as workers/consumers near the "top" of the tech industry, to labour conditions near the "bottom"?**

  – For instance, we might look at mineral mining, manufacturing, cooks and cleaners for tech companies, that sorta thing.

- **Is technology objective and neutral? Or does it express some political vision about how the world is/should be?**

  – Who designs and creates technology? Who doesn't?

  – Who uses technology, and for what purposes? Does everyone benefit equally from technology?

  – Might biases be built into the technologies we create, even without our realizing it?

- **What might it take to develop solidarity or strategic alliances between people with different power in tech?**

  – For instance, between managers and those they manage, between creators and users of technology, between white and blue collar workers in tech, etc.

  – We could also look at alliances along lines of race, gender, sexual orientation, etc.

- **Why is tech so disbalanced demographically (for example, in terms of race and gender)?**

  – Computer science was once dominated by women in North America and Britain – why is this no longer the case? What might that teach us about how to create a more inclusive culture in tech?

    – Are current efforts to increase diversity likely to succeed or might they backfire in the long run?

- **What do we even mean by "tech"?**

    – Who has the power to define what tech is and is not?

    – Who is included in mainstream definitions of tech? Who isn't? Why?

- **What connections does tech have to oppressive military and police forces?**

    – What role are companies like Palantir and Amazon playing in the deportation of migrants and refugees? Or in policing or surveilling communities of colour?

    – Might the fact that the first computers and computer science were developed by the military affect the democratic potential of tech today?

- **What connections might the "Alt-Right" movement have to tech?**

    – How is this movement aided by technology? Or by tech?

    – What specific responsibilities might tech have in combating this movement?

Appendix B: Supports and Obstacles Activity Handout

You don't need to answer the following questions, but you may find them helpful in your discussion.

- Who's already working on the problem? What approaches are they taking in their struggles? Why?

- What do you personally need to improve the situation? (Knowledge, resources, etc). What do your communities need? What does society need?

- Can you think of any social or political groups that may resist the changes required to address the issue? What interests might they have in maintaining the status quo?

- Where do you feel or see this problem happening the most / least? Why do you think that's the case?

- Who is most affected by the problem? What are they already doing to resist or to improve their situation?

- Are there conflicts between different social or political groups in terms of how the problem is understood? What are they? Where do the differences come from, and what effects might they be having?

- How does the organization / structure of your work place make the problem harder or easier to address in your work life? What about the structure of the economy more generally? Why?

- What other social, political or environmental problems is the issue you are looking at also related or connected to? How do they relate?

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