Power and Echoes:
Colonial Relations of Re/iteration and their Genomic Indigeneities

by

Jessica Kolopenuk
MA, University of Alberta, 2012
BA NS, University of Alberta, 2010

A Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree of

DOCTOR OF PHILOSOPHY

in the Department of Political Science

We acknowledge with respect the Lekwungen peoples on whose traditional territory the university stands and the Songhees, Esquimalt and WSÁNEĆ peoples whose historical relationships with the land continue to this day.

Supervisory Committee

Power and Echoes: Colonial Relations of Re/iteration and their Genomic Indigeneities

by

Jessica Kolopenuk
MA, University of Alberta, 2012
BA NS, University of Alberta, 2010

Supervisory Committee

Dr. Rita Kaur Dhamoon, Department of Political Science
Supervisor

Dr. Heidi Kiiwetinepinesiik Stark, Department of Political Science
Departmental Member

Dr. Arthur Kroker, Department of Political Science
Departmental Member

Dr. Kim TallBear, Faculty of Native Studies
Outside Member

Abstract

Through relations deriving Miskâsowin – an Ininiw/Cree theory of science, technology, and society - *Power and Echoes* explores what genomic knowledge means for Indigenous peoples and, also, what Indigenous knowledge can mean for genome sciences. Taking as a centre point that Indigeneity, in empirical and heuristic forms, has been a site of relationally-produced scientific and political knowledge, I ask: what key fields are genomically re/iterating indigeneity in Canada and how are they relationally produced with/through/as the field of colonial power? This research engages four fields of genomics and four re/iterations of indigeneity; 1) forensic science policy and *female-indigeneity* where DNA profiling is increasingly used to identify missing and murdered Indigenous women, girls, and Two-Spirit persons (MMIWG2S+); 2) biological anthropology and *postindigeneity* where the scientific appetite for discovering "Native American" genomes still sees Indigenous bodies as experimental material in life as well as in death; 3) biomedical research and *pathological indigeneity* where the search for racial causes of disease has been replaced by the analysis of genetic immunological susceptibilities; and 4) bioethics and *consenting indigeneity*, the primary field that research institutions use to regulate the wide-ranging and colonial power dynamics involved with doing genomic research with, about, and affecting Indigenous peoples. Together, these clusters of relations are mapped into the overall project that examines how changes in technoscience often correlate with changes in the relationships and biotechnologies that colonial nation-states and their citizenries, scientific fields and their researchers, and also bioeconomies and their consumers use to form themselves through, in spite of, and also, as Indigenous peoples.

Table of Contents

Map of Research Relations

Acknowledgments

I've really struggled with writing these acknowledgements. It's certainly not because there aren't many people whom I owe a debt of gratitude for their support. Rather, I've gotten caught up in the tension between greatly wanting to recognize the people, places, and institutions that have gone into this work; and feeling uneasy about ranking the degrees of their influence. And so, in this medium, I've decided to simply express my most devoted appreciation to all those who have given me their love, forgiveness, and care throughout this process. I express gratitude to those have taught me about the potency of Indigenous power to upend colonial strongholds on our bodies. For now, I simply say, thank you. The rest will be done when I see you.

I do, however, want to treasure the names of my immediate family members on this page who with no university degrees of their own have loved me into earning a Ph.D.: Sylvia Munro-Smith (mom), Bruce Kolopenuk (dad), Eileen Kolopenuk (Baba), Joseph Kolopenuk (Gigi), Marlene Feenstra (Gram), Auntie Sheila and Uncle Jan, Peter Kolopenuk, Maddax Kolopenuk, and Islay, Gizz, and Minôs.

Dedication

For my mom and my mum.

Chapter 1

Miskâsowin: Indigenous Science, Technology, and Society

Marlene Feenstra (née McCorrister), my grandmother, was a Cree woman from Peguis First Nation. Peguis, our nation, is nestled among the ancestral lands and shared territories of the Cree, Anishinabeg, Assiniboine, and Métis peoples: our homelands that sprawl out from the forks of the Red and Assiniboine Rivers in what is now Winnipeg, Manitoba, Canada. Our ancestors, mostly Cree/Ininiwak and Saulteaux/Anishinabeg peoples, signed Treaty 1 in 1871 with the Crown and on behalf of the Government of Canada. In this legal agreement they pledged to peacefully live and share parts of their territories with European and Canadian settler populations. Within the 5 years following treaty ratification, Canada unilaterally consolidated the *Indian Act*, 1876, which meant that Treaty 1 (as it was understood through Ininiwak and Anishinabeg legal orders) would not be used to structure Indigenous and settler relationships in the area.[1] Instead, the *Indian Act* inaugurated an aggressive assimilationist agenda that would attempt to transition Indians into civic life.

My Gram, born in 1936, lived during a time when formal colonialism was materially palpable among the everyday realities of Indigenous peoples. Her legal identity, upon birth, was dictated by Canadian law and she grew up on the Peguis Indian Reserve. She attended residential school (a federal policy designed to civilize Indian children by removing them from their families, cultures, and often, territories), and then, as an adult, she was legally denied residence on her reserve due to her marriage to a non-Indian, also dictated by Canadian law. Yet, despite

[1] Aimée Craft (2013), for example, has written about how Treaty 1, the Stone Fort Treaty, was created in accordance with the Anishinabeg legal order in the area.

these experiences, among others, and like those of many Indigenous peoples, my grandmother never thought of herself as being colonized. She rejected knowledge misconstrued about her. "Mar-Baby's" willful embodiment is the stuff that Indigenous power is made of.

Three years ago, when my grandma passed away, I spent a few days going through the old photographs, newspaper clippings, calendars, and notes she had archived for over 60 years. Among the many artefacts of her life, I found a small collection of mid-century postcards. The cards, never having been mailed as if for their intended purpose, were held onto; I imagine, to remind her of a memorable road trip and I was glad, on that cold Winnipeg afternoon in December, to appreciate her taste in interesting imagery. Their combined content lays out a scene ripe for analysis: a card depicting what it called the "Discovery of Canada:" Jacques Cartier presenting the "weird apparition" of an Indian Chief to the King and Queen of France in 1536; a card named the "Canadian Rockies" displaying Alexander Mackenzie, Simon Fraser, and La Verendrye: on the back, the postcard describes them as "great explorers who played stupendous and courageous roles in western development;" another postcard of 19th century Métis leader, Louis Riel, sitting inside of a prison cell awaiting his federally sanctioned execution; and finally, perhaps seemingly and, at first glance inconsistently placed, a postcard with the name "Science and Invention:" a basement laboratory peopled by Albert Einstein, Thomas Edison, Alexander Graham Bell, and Frederick Banting.

It is difficult to say whether my Gram chose these cards for how they, when taken together, illustrate the curious relationships between colonial expansion, the confinement of Indigenous peoples, and scientific inquiry. If she *did* conceive of the reciprocal relationships connecting the logics of exploration, discovery, and innovation with histories of colonialism, she would have been in good company. Historians of colonial science, for example, have posited a

historically-located relationship between the development of what is now considered modern science, the technoscientific advances indelibly marking western civilization, and European imperialisms and colonialisms (for instance Schiebinger, 2005 & 2004; Harris, 2005; Harrison, 2005; Adas, 1989; Headrick, 1981; Brockway, 1979; Wallerstein, 1976).[2] Further, Indigenous Studies scholars (Arvin, 2019; Munsterhjelm, 2014; TallBear 2013; Bastien, 2004; Cajete 2000; Deloria Jr., 1995 & 1969) have located modern science and technology among an ongoing colonial system, which working in tandem (and, at times, in tension) with other institutionalized fields, conjure the power to rescript Indigenous peoples' knowledges of their existence *as* peoples in terms of the possessive logics of gender, race, rights, sovereignty, and capital.

The relationships sketched out by these bodies of scholarship and, perhaps intuitively by my grandmother, indicate their preclusion of thinking about science and colonialism separately. Their relational framing, which, to repeat, understands scientific and colonial relations of power as being interlaced, is evocative given that colonial ideas about race, sex, and reason have concurrently framed Indigenous peoples as objects of scientific curiosity and as experimental material, rather than as producers of knowledge; as primitive peoples to be civilized through western education, rather than as innovators of complex cultures and societies; and as wards of nation-state governance, rather than as sovereign nations and self-determining peoples. There is, however, little research (Arvin, 2019; TallBear, 2013; Deloria Jr., 1995) that interrogates the relations through which scientific knowledge production, the institutionalization of science and

---

[2] For instance, advances in astronomy and thus navigation in addition to developments "in oceanography and climatology, in cartography, botany, agricultural sciences, geology, medicine, pharmacology, weaponry, and other fields" (Harding, 2008, pp. 136-7) were produced in relation to European colonial exploration and expansion. As Jodi Byrd (2011) explains of Captain Cook's Pacific voyages; "Launched under the auspices of scientific discovery…Cook's initial mission to record the transit of Venus inaugurated a wave of Pacific invasion" (p. 2).

technology fields (away and apart from those deemed social and humanist), and national science policy programmes have been produced and sustained with the formation of Anglo-First-World nation-states where formal colonialism never fully ended (i.e. Canada, the US, Hawai'i, Guam, Australia, and Aotearoa/New Zealand).

The concept of indigeneity, in its various iterations (including, for example, *Indian Act* Indianness or constitutionally-defined Aboriginality, etc.) relies on haecceites (i.e. the thingness of a thing) such as racialized/ing-gendered/ing notions of blood quantum or genetic notions of Native American DNA, that epistemologically and materially pervert and reorder Indigenous peoples' relations to place and to each other. In the course of modern knowledge creation, including that which has been formative of scientific fields and vice versa, Indigenous peoples have been constructed, in no small measure, as not being reasoned enough to produce valid knowledge, to run real governments, or to own land. As such, "indigeneity," in empirical and heuristic form, has been a site of exchange between relationally-produced *scientific* and *political* knowledge.

Indeed, knowledge of racial and then species purity has conditioned practices of territorial and political invasion and dis/possession as being *natural* and, thus, just (Horsman, 1981; Samuel George Morton, 1839; Gobineau, 1854; Linneaus, 1735; Buffon, 1749-1804). To put it differently, colonialism involves the production and regulation of bodies deemed *Aboriginal*, *Native American*, or *Indian*, etc. insofar as formalizations of racialized/ing-gendered/ing difference, nation-state citizenship, legal personhood, and, more recently, biological variation have been predicated on how possessive and exceptional subjects and nation-states are different from those ascribed to (an) iteration(s) of indigeneity. Manifest destiny was and is a manifestly racialized/zing-gendered/ing journey. This is all to say that scientific fields in

countries like Canada, but also, other Anglo-developed countries like the United States, Australia, and Aotearoa/New Zealand have contributed to building colonial multiverses whose troubled histories nevertheless inexorably continue to condition the creation of innovative knowledge in the 21st century.

Among the most rapidly expanding knowledge marking 21st century contexts and transforming the way that research is done in the life sciences, for example, is genomic knowledge (Reardon, 2005, p. 3). Broadly put, genomics – a loosely tacked field whose shape is finding form through advances in biological sciences is drawing academic, industry, and policy attention toward bio-based resources, technologies, and economies. For example, genomic sequencing has been leveraged to generate a market for direct-to-consumer health and ancestry testing; metagenomics is being applied on environmental scales for projects like oil sands reclamation and water management; and metabolomics for the development of precision medicine.[3] Over the past decade, increasing resources have been poured into DNA-based research in most modern industrial countries. In Canada, coming in directly after the tri-council agencies, Genome Canada receives on average $63 million dollars per year in federal funding (Naylor Report, 2017, p. 6).

Far from remaining within their perceived field of production, genomic iterations of species and populations are rapidly affecting the ways that policy-based solutions to contemporary governance problems are being determined (Subramaniam, 2014),[4] and relocating

[3] "If genomics is the study of the genome of an individual, then metagenomics is the genomic study of multiple individuals, often as a mixed environmental sample. By comparison, similar sounding metabolomics is the study of metabolites/chemical synthesis present in an individual" (Cardinal-McTeague, 2019).

[4] Dhamoon (2009) conceptually refers to "identity/difference" rather than "identity" in order to denaturalize relations of liberal identity politics and exposing the relations of power that produce,

political struggle to strange new sites like along digital flows of information (Nakamura and Chow-White, 2012) and scales of temperature (Radin and Kowal, 2017). There are three meta-fields upon which the sequencing of human genes and genomes has taken root and are affecting policy making: forensic science where DNA profiling has become a marker of modern industrial countries and used, particularly, in criminal investigations and for logging the biological data of criminal offenders; biomedicine and bioethics whereby scientists and policy makers have anticipated that genomic research will lead to unprecedented contributions to knowledge about health and disease, ultimately transforming clinical practice; and biological anthropology where DNA-based understandings of human ancestry are affecting how identities of difference, expressed in terms of citizenship, nation, and race are formed.

For Indigenous peoples, the study of DNA, whether it is done to identify a missing person, to search for genetic factors of disease, or for mapping ancient human migrations, has been ascending as the fields of science, politics, and law continue to be defined by power imbalances in which Indigenous peoples are not often in governing control of the policies and knowledge that affect them (Leroux, 2018; Kolopenuk, 2017a; TallBear, 2013; Berthier-Foglar, Collingwood-Whittick, and Tolazzi, 2012; Hinterberger, 2012; Kohli-Laven, 2012; Harry, 2005; LaDuke, 2005). Biotechnologies that are predominantly owned and governed by non-Indigenous peoples, governments, and institutions are re/configuring the concept of indigeneity. As such, genomic re/iterations of indigeneity are not a revolution in scientific practice, but rather, they are shaped by and re/shape the others: Indian, Aboriginal, Native American, etc. Together, these

---

organize, and regulate meanings of difference (p. 2). In my discussion of re/iterations of indigeneity, I am purposefully not discussing "identity." Rather, I am discussing relationships (structured/structuring through relations of power) that are generated through identity claims and which act to reorder Indigenous peoples' articulations of peoplehood into identity-based categories.

re/iterations operate as an extension of a more-than-state-based system of coloniality that operate in ways that dislodge and reorder the relations that moor Indigenous peoples to self, place, and kin.[5]

In light of this genealogy and trajectory, Indigenous peoples have generally come to understand genomic research and the bioethical policies that shape them within the context of sovereignty; they assert that genomic sciences are about power – having power to make decisions about their own bodies, territories, and human and non-human relatives. Moreover, scholarship related to Indigenous peoples and genomics emphasizes the need for Indigenous governance over the sciences and technologies that affect them. Additionally, Indigenous scholarship and activism call for greater scientific literacy among Indigenous peoples so that they may engage robustly with genomic (and other scientific) research projects and policies or develop them entirely (Indigenous STS, 2016-2019; Harry and Dukepoo, 1998, p. 3).

For as long as genomic sciences have been emerging, there has been Indigenous engagement with their implications. In response to scientific efforts to collect, sequence, store, and patent genetic material, there was a surge of critical scholarship that emerged following the launch of the Human Genome Diversity Project in the late 1990s and early 2000s (Barker, 2002; Harry, 1993; Dodson and Williamson, 1999; Cunningham, 1998). More recently, Indigenous peoples are developing or influencing scientific procedures and policies to govern the genome

[5] Expressing re/productions or re/iterations of indigeneity, as such, is meant to create analytical and visual space for examining the empirical specificities with respect to the ways that these productions (etc.) on one hand, do not wholly and independently exist, but on the other are nonetheless articulated in epistemologically distinctive ways and through distinctive relations of power. Put differently, although internal dynamics among fields of knowledge production do not exist completely independently of other fields and therefore do not constitute social reality on their own, they nevertheless "*refract* symbols, meanings, and identities already in circulation elsewhere" (Andersen, 2011, p. 49 emphasis added).

sciences that affect them (Bardill, 2017; Bolnick et al., 2012; Garrison, 2012; Taniguchi, Maile, and Maddock, 2012; Mello and Wolf, 2010; Cunningham et al., 2007; Arbour and Cook, 2006; Fong, Braun, and Chang, 2006). Others have connected the governance of genomics with concerns over multicultural interactions between Indigenous and scientific cultures (Malhi and Bader, 2015; Tsosie, 2007; Bowekaty and Davis, 2003; Foster and Sharp, 2000); and yet, others have paid particular attention to reconfigurations of nation, conceptually understood, and national politics, empirically practiced, with respect to genomic narratives of race, gender, and hybridity (Wade et al., 2014; TallBear, 2013, p.46). Adding to these studies, I wish to grapple with ways that genomic knowledge forms and undoes indigeneity to make sense of dis/possession as it manifests beyond the loss of land, and move toward identifying embodied relations of dis/possession generative of the current biotechnologically-dominated time-space that are linked to, yet analytically distinguishable from, territorial analyses. I ask; what are the key fields that are genomically re/iterating indigeneity in Canada and how are they relationally produced with/through/as the field of colonial power? Broadly, what can genomic biotechnologies, research, and policies relating to indigeneity reveal about shifting relations of (colonial) dis/possession (so far)?

Biotechnological politics abound and amidst a growing tension between sovereign power and transnational scientific mobilization that pits post-truths and fake news against evidence-based decision-making, I am interested in understanding what genomic knowledge portends for meanings of indigeneity – especially given the deeply dis/possessing effects, including definitions that have been used to justify and administer the colonial dis/possession of territories and bodies that re/iterations of indigeneity have had on Indigenous peoples. From the other

direction, I am interested in exploring what Indigenous knowledge, broadly conceived, has and can mean for genome sciences and policies. Specifically, I look at:

- forensic science where DNA profiling is being increasingly used to identify missing and murdered Indigenous women, girls, and Two-Spirit persons (MMIWG2S+) to reduce rather than end colonial violence. This growing trend indicative of biotechnological governance will be analyzed in Chapter 2 by demonstrating how a genomic re/iteration of *female-indigeneity* becomes seeable and seen through relations of violence and nation-state data-basing; in particular, I examine how racialized/ing-gendered/ing juridical relations have generated knowledge of "Indian womanness" and which are now further circumscribing the biotechnological limit of so-called closure in the deaths of Indigenous kin collectivized as "MMIWG."
- biological anthropology where the scientific drive to discover Native American genomes still sees Indigenous bodies as experimental material in life as well as long after they die. In Chapter 3 I will explore how *postindigeneity* becomes real through biotechnological and digital relations of dis/possession made manifestly possible through the convergence of anthropology, capital, and affect: a hyper-racialized/ing-gendered/ing bioeconomy. I argue that this genomic iteration of indigeneity (postindigeneity) is rapidly relativizing kinship-based peoplehoods and the earthy relations that link them into existence.
- and biomedical research, where the scientific search for innate racialized/ing-gendered/ing causes of disease has been replaced by the search for genetic immunological susceptibilities. In Chapter 4 I will examine how *pathological*

indigeneity becomes epistemologically and physically re-iterated within the body. This analysis will lead to my analytical problematizing of existing Canadian research ethics standards among genomic research and point out the ways that they cannot address the colonial paradox that lay between *collective* (defined by the human genome) access to healthfulness and the molecular *particularities* of human bodies and between human populations.

Together, these clusters of relations will be mapped into my overall project that examines how changes in technoscience often correlate with changes in the relationships, techniques, and technologies that colonial nation-states and their citizenries, scientific fields and their agents, but also bioeconomies and their consumers use to form themselves through, in spite of, and also, as Indigenous peoples. By mapping the epistemological and institutional clusters of relations that make and are made by genomic knowledge in Canada, and, especially, how they re/iterate indigeneity among the fields of forensic science, physical anthropology, and biomedical research, *Power and Echoes* offers an original intellectual contribution. I explore how in distinct science and science policy sites; the implications of genomic knowledge extend beyond the specter of Indigenous identity politics differentiated by culture.[6] The dissertation, being read forwards or backwards, generates a Cree theory of science and technology - Miskâsowin - taking as its centre – my body - as being re/iterated by and exceeding the relations that see indigeneity.

I move with the reader on an examination of the field of genomics through the prism of critical Indigenous theory. From this direction, I understand the genomic field - its research,

[6] Genetics research refers to the study of one or multiple isolated genes in an organism whereas genomics research refers to the study of all the genes in a genome. I use "genomic" as a shorthand to encompass both or either of these possibilities.

knowledge, policies, dispositions, and institutions - as being interlaced with geopolitical relationships of coloniality. I will identify relations of tension and slack that exist between state and more-than-state relations, and where Indigenous peoples – as if dandelions emerging from the lines of cracked concrete – might intervene to govern the genome sciences that affect their bodies, territories, relatives, and peoples.

Throughout the following chapters, I will deconstruct and, in effect, denaturalize common conceptions regarding what science is, how it came to be, the roles it plays in, and the responsibilities it has to society. I ask readers to take pause amidst the accelerating pace of genomic data generation to consider how we have gotten here and in what direction we might want to go. My work pushes against orthodox cultural expectations that would otherwise see that Indigenous traditions remain apart from that which is deemed technoscientific and modern. Embodying political theory, Cree knowledge, and genome sciences my dissertation contributes a novel analysis of the dis/possessing power dynamics involved in genomic research and policies in Canada. Additionally, and cumulatively, it forges a specifically Cree research methodology routed through Ininiw truth-telling and relationality, Miskâsowin: a uniquely Indigenous set of methodological relations empowered to engage with science and technology fields.

Seeing Relations

Among Cree peoples, stories are told about the first woman: *Achakwyan*, Star Woman. In my understanding, Star Woman travelled ablaze from the hole in the sky, *pakwankîsik*, as some Cree call it, but others know it by the cluster of seven stars called the Pleides (Buck, 2018, 2016). With grandmother spider's webbing to guide her fall, Star Woman landed on territories that are now understood to be North America. Elder Wilfred Buck from the Opaskwayak Cree Nation in Manitoba explains that Cree and other peoples come from that place too, and when our earthly

bodies reach the end of their cycle, we return through that cosmic umbilical channel (Buck, 2016). Through this movement, we know the stars as ancestors (pastpresentfuture), as ourselves and, as such, these relatives defy the notion that earthly and extra-earthly existence remains unequivocally and atmospherically separate. This Cree knowledge is not simply a metaphorical story – it posits that we are the stuff of space – star people. Armed with *telescopes, light beams, and lenses* astronomers, professional and amateur, enjoy watching us and our relatives as we dot the night sky.[7]

Worlds away from Cree logics, Hannah Arendt (1958) explains that the stargazing technology – Galileo's telescope – was the first purely scientific technology bridging humans into a new modern age. Arendt (1958) describes also two other events that mark the threshold of the modern age:

> The discovery of America and the ensuing exploration of the whole earth; the Reformation, which by expropriating ecclesiastical and monastic possessions started the two-fold process of individual expropriation and the accumulation of social wealth; the invention of the telescope and the development of a new science that considers the nature of the earth from the viewpoint of the universe. (p. 248)

Galileo himself was the first to view *pakwankîsik* through his telescope, publishing his observations in his 1610 treatise, *Sidereus Nuncius*. With a new view of that which suspends beyond the earth, the telescope would, according to Arendt, contribute to launching humans into a new universal sense of existence - a desire to be unbound by and to their so-called earthly human condition. Arendt must not have been familiar with *Ininiwak* accounts of galactic

---

[7] I want to acknowledge and thank Kirsten Lindquist who always encourages, celebrates, and pushes my ideas. She has especially nurtured my interest in star knowledge and I am immensely grateful for our collaborative thinking process (JAKKAL).

mobility. She explains, instead, that humans developed, *for the first time*, a sense of having a place in the universe, making them no longer confined to the boundaries of, say, citizen and country. As such, by ushering in a new science that "considers the nature of the earth from the viewpoint of the universe," (Arendt, 1958, p. 248) the invention of the telescope, Arendt goes on, was implicated in ontologically conditioning European exploration of America and the rest of the world by dislodging the human condition from its embeddedness in place (p. 248). It would, in other words, not simply coincide with, but contribute to enabling European expansion (p. 248). With a shift in perspective, man was free to venture out and bring that which had always been unseen and unknown into sight and as it would happen, into his possession.

Michel Foucault can be read in a way that extends Arendt's hypothesis in his identification of the link between the development of *technologies* and shifts in the *techniques* of power that produce the human biologically. As he famously explains, in the late 18th century, humans become understood and defined biologically, as a species and, as such, a politics of defining and regulating populations as natural objects emerged in and of modernity. What he calls biopolitics "deals with the population, with the population as a political problem, as a problem that is at once scientific and political as a biological problem and as power's problem" (Foucault, 2003, p. 245). In the second half of the 18th century, the seizure of disciplinary power which targeted the individual body was effectively massified insofar as power began to target man-as-species (p. 243). Aileen Moreton-Robinson productively adds to Foucault arguing that, as a part of the modern turn, race emerges as a biological construct through disciplinary knowledges in the life sciences, where disciplinary mechanisms were subsequently developed to

write race onto bodies and control humans as a speciated "population" *through the administration of difference* (Moreton-Robinson, 2015, p. 129).[8]

Foucault's biopolitics seem to have foreshadowed the current biotechnological turn that we have been seeing since the turn of the 21st century, even if he did not predict the extent to which a biopolitics of surveillance would be intensified to a biotechnological politics of control. This difference marks a power that relies on the subject to discipline their own behaviour knowing that someone *might* be watching or *could* see them and a power that *can* and *does* constantly see the subject and at scales never before viewed. The difference I sketch here is, as all written analytics, heuristic (not necessarily real in practice) but, I think, capable of being reconciled. Foucault's understanding of ocular relations is instructive for the present study, and he addresses the telescope particularly in *Discipline and Punish*. He writes,

> Side by side with the major technology of the telescope, the lens and the light beam… there were the minor techniques of multiple and intersecting observations, of eyes that must see without being seen. (p. 171)

Signaling the ocular-centricity of modern power relationality and the commensurate reciprocal production of man and machine, Foucault explains that developments in technology often beget transformations in the very techniques of power used in the production and surveillance of bodies and populations. And, as such, far from deducing fact from the purportedly objective gaze of the telescope, the human coerces it into helping him generate a representation of the universe: Foucault (1995) writes, "Over the whole surface of contact between the body and the object

---

[8] TallBear (2013) has similarly shown that in the context of physical anthropology population has come to replace race as an organizing and sampling category; Rifkin (2014) discusses how Indigenous peoplehoods have been translated into administrative populations; and Andersen (2008) has discussed this shift in the context of Métis racialization.

[technology] it handles, power is introduced, fastening them to one another. It constitutes a body-weapon, body-tool, body-machine complex" (p. 153). All technologies, not only the ones that are used in contemporary life sciences, are, therefore, *bio*technologies in the Foucauldian sense that they become conjoined with a human constructed in modernity as a biological body and subject, and together now as one, they set out to bring the un-seeable into sight. With biotechnologies mediating sight, including *that* and *how* a given body or population is made to be seen, the "order of things" (Foucault, 2010) and the "vision of things" (Wolin, 2004, p. 20) are relationally generated/tive. Ocular relations matter to the present theorizing of genomic biotechnologies, therefore, because in modernity "The power to see, the power to make visible, is the power to control" (Levin, 1993, p. 7).[9]

Through the gazes of biotechnological interpolation, all bodies are not seen equally. Fanon, for instance, frames race in terms of, and in the insightful words of Arun Saldanha (2006), a "racialised regime of vision" (p. 11) in which phenotype always somehow matters to the gaze of the colonizer. Within modern regimes of power, regulating techniques do not operate to eliminate human difference, but produce and administer it differentially (Foucault, 1995, p.

[9] While critical theorists have examined the distinctively modern epistemology and practices of vision, ocularcentrism is not an exclusively modern phenomenon. Aristotle, for example conceived of sight, the most virtuous sense, as most closely resembling reason and intellect (see Jonas, 1966); while Aquinas (*Sum. Theol* 1. 67. 1, corp.) links sight with intellectual cognition (see Levin, 1993). However, as Foucauldian commentators have remarked, "Only in modernity does the ocularcentrism of our culture make its appearance in and as panopticism: the system of administrative institutions and disciplinary practices organized by the conjunction of a universalized rationality and advanced technologies for the securing of conditions of visibility" (Levin, 1993, p. 7). The uniqueness of modern ocularcentrism indicates not the point of origin for an ocular epistemology, but a new wave of emergence. Foucault identifies this wave by noticing a distinction between a "detached, contemplative view" and "a dominating gaze" (Flynn, 1993, p. 275). From an Indigenous standpoint, Vince Diaz (2016 & 2012) critiques ocularcentricity and emphasizes, instead, olfactory as a means of learning and telling Indigenous histories.

89). Within colonial configurations of modernity, indigeneity is, according to this frame, an effect of power, not an already fully constituted form upon which power is then exercised. Re/iterations produce indigeneity as an identity they claim to describe and they, like *Indian Act* Indianness or constitutional Aboriginalism or Native American DNA, labour in and of colonial relations in ways that attempt to reorder the ontological relationships to selves, spaces, and relatives that organize the existence of Indigenous peoplehoods in forms more amenable to nation-state governance (i.e. possessable) and giving way to biotechnological politics of control.

As I will demonstrate, Indigenous bodies and territories have been defined and acted upon through scientific and political philosophical observation in ways that have not only led to individualized/ing bodily violation, but to producing indigeneity conceptually in such ways that *biologize* dispossession as *natural*. Re/iterations of indigeneity serve a relationally reinforcing double function: they smooth out the wrinkles of contingency that fragment the population of humans more generally in order to streamline governance and increase predictability and control; they also produce difference to maintain hierarchy and justify colonial possession. This is all to say that modern sciences and technologies and the stories that they generate whether they be about the stars and planets or other bodies come out of histories of colonialism; meaning they have been, in part, formed out of the ways that Indigenous peoples, our relatives (human, non-human, earthly, extra-earthly), and territories have become visual objects of scientific and political inquiry and governance.

While fixation with looking at the stars has facilitated generations of telescope advancement since the time of Galileo, biotechnologies have been simultaneously developed to examine and understand the molecular constellations within human bodies. While star gazers equipped with *telescopes, light beams, and lenses* name and map the star people who currently

sit beyond the earth, geneticists, physical anthropologists, and forensic scientists similarly generate biotechnological knowledge to make sense of the lives and deaths of human, earthly star bodies as well. These efforts are part of a hyper-technoscientific time-space in which biotechnological advances are enabling scientists to imagine new boundaries in the making visible of unseen places and bodies. Through emergent biotechnologies like genetic analyzers, bioinformatic software, and climate-controlled biobanks, it has become possible to see the human body on a scale never before transgressed.

The re/iteration of Foucault's ocular relations presented here is an important contribution to this dissertation's theoretical framework because it emphasizes the need to understand and represent power beyond a right/law/sovereignty paradigm. In some measure, law and policy have not kept regulatory pace with the prevailing biotechnologies of the time and the accelerating intensity at which they are seeing universes. Embodied dis/possession can include not being productive of the knowledge that describes you and not governing the science and technology fields that are implicated in producing it. In this sense, dis/possession from territory is necessarily always an embodied experience, and embodied dis/possession via the racialized/ing-gendered/ing of indigeneity is also an assault on emplaced existence/our emplacement as peoples (linked to our orientation to misewa – all that exists). Therefore, there are influential fields and formations of knowledge that are being generated and which exclusively nation-state-based analyses cannot fully grasp. By analyzing (embodied) techniques of dis/possession, I develop a critique of colonialism that extends beyond the framework of geo-politics to demonstrate that colonialism and its interest in land dis/possession encompasses the racialized/ing-gendered/ing production of indigeneities and bodies deemed Indigenous as part of that land grab.

As I will show, the making visible of genomic indigeneities is implicated in relations of dis/possession as others have been, but it will also show what I am calling, *seeing relations* as a site of Indigenous power. I have found inspiration in bell Hook's (1992) theorizing of "the oppositional gaze" of black female spectators who, through politicized "looking relations," defiantly "look back" (p. 116) at materializations of whiteness and patriarchy, and their representations of black femaleness. She writes, "Subordinates in relations of power learn experientially that there is a critical gaze, one that looks to document, one that is oppositional" (p. 116). In resistance struggle, the power of the dominated to assert agency by claiming and cultivating "awareness" politicizes "looking" relations – one learns to look a certain way in order to resist. I am well placed to see genomic indigeneities. As Moreton-Robinson (2015) argues, Indigenous standpoints are uniquely well-positioned to decipher knowledge related to colonialism (instead of patriarchal whiteness) because "[f]or Indigenous people, white possession is not unmarked, unnamed, or invisible; it is hypervisible" (p. xiii). The data and analysis presented in this dissertation is, thereby, itself an embodied form of power generated by/of seeing relations: Ininiw eyes directed at genomic re/iterations of indigeneity.[10]

Cultural Relations

[10] I want to manipulate the reader's rhetorical relations of thought by conceptually deprivileging race and whiteness (because the patriarchy of whiteness too often gets left out). For example, when I conceptually discuss patriarchy, I mean also whiteness, and when conceptually discussing gender and sex, I mean also race. These concepts themselves are not to be used interchangeably and thereby create some sense of analytical relativism. Rather, my intention of terminologically reinforcing the reciprocal existences of racialized/ing-gendered/ing relations of power (even and especially that it is a word salad), is to play with and challenge the mental shortcuts that we often take and which filter out consideration of the relational re/productions of race and gender, patriarchy and whiteness (purity of form). I am asking the reader to challenge themself to think also of race and whiteness when they see the terms, gender, sex, and patriarchy; and to bear with me as we work our way to new-ish conceptual languages.

In the 1960s and 70s, Indigenous sovereignty movements took place in mostly First World Anglo nation-states where, unlike in other parts of the imperial World, British (and to a lesser degree French and Iberian) colonizing powers transformed into geopolitical countries (like Canada, the United States, Hawai'i, Aotearoa/New Zealand, and Australia) that never stopped occupying and claiming formal sovereignty over Indigenous homelands (Moreton-Robinson, 2016). Among these movements, Indigenous intellectuals and activists saw universities as major pipelines fueling colonial projects of appropriation and misrepresentation, which buttressed equally colonial projects of state-craft. These intellectuals (i.e. Vine Deloria Jr., Jeannette Henry, D. Scott Momaday, Olive Dickason, and others) wanted "a seat at the table…a primary seat as transformationists within the bounds of scholarship" (Cook-Lynn, 1997, p. 22). Their combined efforts led to the eventual formalization of Indigenous Studies, in its regional manifestations, as an academic discipline over the past sixty years (Native Studies in Canada, American Indian Studies in the U.S., Maori Studies in Aotearoa, Kanaka Maoli Studies in Hawai'i, and Aboriginal Studies in Australia).

Resistance against the *ongoing* colonial dis/possession and thus incomplete settlement of Indigenous homelands by Euro-descendant nation-states, their citizenries, and markets demarcates the intellectual and institutional foundations of Indigenous Studies. By prioritizing Indigenous peoples and their experiences, knowledges, and stakes in research, the Indigenous Studies project has been connected to the defense of Indigenous sovereignties, territories, economies, and rights (Andersen and O'Brien, 2016; Moreton-Robinson, 2016; Kulchyski, 2000; Dei, Hall, and Rosenberg, 2000; Cook-Lynn, 1997). The genealogy and trajectory of Indigenous Studies can be differentiated from colonial, post-colonial, and settler-colonial studies (i.e. the particular strand of settler-colonial studies not rooted in Kanaka Maoli/Native Hawaiian thought)

– fields that, in contrast, have been engaged with the global and local politics associated with the *end* of formal colonialism and its transformation along axes of global development and settler theories and policies (Byrd, 2011).

Proto-Indigenous Studies scholars (such as Vine Deloria Jr., Jeannette Henry, D. Scott Momaday, Olive Dickason, and others) who shaped much of the intellectual foundation of the discipline, were primarily engaged in an endogenously Indigenous project of studying their own cultures, languages, histories, and politics, which had been previously dominated in the academic field by exogenous research conducted by non-Indigenous people (Moreton-Robinson, 2016, p. 6). Struggle over who ought to represent Indigenous peoples within the productive capacities of scholarship has amplified "indigeneity" (in its various iterations) as an object of theoretical inquiry and debate within the discipline, and particularly according to a cultural impulse.

Among this re/turn, Indigenous cultures have become used to frame Indigenous research methodologies and assert or recover who Indigenous peoples are from their own standpoints. The recovery and operationalization of Indigenous cultures are said to act as a form of political resistance against colonially "imposed ways of knowing" (Dei, Hall, and Rosenberg, 2000). While having many names,[11] Indigenous knowledge systems embedded in and expressed by Indigenous languages, and shaped by/formative of Indigenous cultures are said to share a place-based quality of Indigenous peoples (Tuck and McKenzie, 2015; Kimmerer, 2013; Coulthard, 2010; Bastien, 2004; Cajete, 2000; Dei, Hall, and Rosenberg, 2000). Indigenous Studies

[11] Various English terms have been used to represent Indigenous knowledge systems. They are referred to, for example, as tribal paradigms by Bastien (2004), as Native science by Cajete (2000), as Indigenous worldviews by Simpson (2004), as tribal knowledge by Kovach (2009), as Aboriginal knowledge by Brant- Castellano (2000), and as Indigenous metaphysics by Coulthard (2010).

scholarship has correspondingly identified Indigenous research as that which is uniquely done through methodological approaches that are structured by Indigenous ontologies and epistemologies (Kovach, 2009; Wilson, 2009; Bastien, 2004), as well as culturally appropriate methods like, to name some: story-telling (Anderson, 2011; Johnston, 1987); observation (Kimmerer, 2013; Bastien, 2004; Brant-Castellano, 2003); and revelation or dreaming (Kovach, 2009; Brant-Castellano, 2003). Others have advanced a resurgent paradigm (see for instance Mack, 2011; Simpson, 2011, 2008; Alfred 2005; Alfred and Corntassel, 2005) in which the role of Indigenous cultures is emphasized in the adaptability of Indigenous communities, reconnection with homelands, and the formation of an "authentic Indigenous identity" (Alfred and Corntassel, 2005, p. 609). Indigenous cultural identity/difference has become the conceptual ground significantly shaping the intellectual terrain of Indigenous Studies and, as such, can be described as being one of the discipline's orthodoxies.

Indigenous cultural identity/difference is commonly constructed in Indigenous Studies research by identifying boundaries between what are considered "Indigenous" and what is "Western/colonial" (see for instance Kovach, 2009; Wilson, 2009; Bastien, 2004; LaDuke, 2005; Cajete, 2000; LittleBear, 2000). Dei, Hall, and Rosenberg (2000), write, for example, that Indigenous knowledges exist "apart from colonial or imperial formations" (p. 5), while Jacob (2014) defines traditional Indigenous culture and knowledge as that which is "precolonial" (p. 10). Equally, it is common to read accounts that position the Enlightenment as the birthplace of science and positivism, which are all deemed Western and colonial (Dei, Hall, and Rosenberg, 2000, p. 9). The logic of the pattern presented here maintains that there is a clear difference between what is Indigenous and what is non-Indigenous, and particularly, what is colonial as it relates to culture and knowledge and, importantly, *that the distinction can be identified*. Said

with more nuance, at conceptual and analytical levels Enlightenment or western rationalism is understood as indigeneity's enemy rather than its birth mother – the one who has re/iterated its form. But of course, the becoming of the concept of indigeneity required the presence of those who were not Indigenous and its contemporary re/iterations have emerged through manifold manipulations and discursively Indigenous mêlées.

Additionally, and even when attending to national or tribal particularities (for example, Doerfler, Sinclair, and Stark, 2013; Kovach, 2009; Bastien, 2004; Johnston, 1987), these approaches tend to imply an ahistorical cultural universality as it relates to knowledge being Indigenous by collapsing the temporal/spatial depth of Indigenous knowledges prior to colonialism and framing Indigenous culture as originally and homogeneously pre-colonial. However, the epistemological discreteness that is sought here is less than easy to prove when positioned as a historical question. For instance, by the 1990s, history of colonial science studies showed how Indigenous knowledges around the world contributed to the formation of what would eventually be understood as modern science (Shiebinger, 2005). More recent studies have further demonstrated the contingent character of the formation of colonies, colonial sciences, and knowledge, which were all subject to change as well as the subjective interests of people, Indigenous and otherwise (Stoler, 2009). There is no such thing as, in other words, epistemological purity.

In addition to framing indigeneity according to cultural identity/difference tied to a temporally/spatially unspecified pre-colonial existence, others use the idea of "nature" to distinguish the character of Indigenous cultures. For example, Cajete (2000) writes that native science (his term for Indigenous knowledge) is "'rooted' in a life-centered, lived experience of the natural world" (p. 5). Bastien (2004) writes that Indigenous ways of knowing are by "nature"

(p. 1) different than eurocentered sciences. Likewise, Kovach (2009) writes that colonialism has interrupted the "organic transmission" (p. 12) of Indigenous cultures. The discourse of nature is presented in two ways here: one, that Indigenous knowledges are deemed as having inherent features that make them naturally different than western knowledge systems; and two, that Indigenous knowledges pertain to the natural world.

The empowering of nature to underscore meanings of Indigenous culture is limited/ing in at least (also) two ways: one, they condition a logic of purity that smears indigeneity with a stroke of inherence. As argued above, it has been through logics of purity that race and sex based re/iterations of indigeneity have enabled the naturalness of its dispossession. We might consider, then, rejecting the purities that have soiled Indigenous peoplehoods. Two, the emphasis that Indigenous knowledges pertain to nature, strengthens a binary of "the natural," and, say, "the political." An assertion that Indigenous logics pertain only to the natural world, limits its utility in theorizing political concepts like "power," "whitenesss," "patriarchy," and "colonialism." It also means that Indigenous knowledges might be used in evidence-based policy-making pertaining to the environment, but not for, say, electoral reform (for example). In formulations of naturalized cultural difference, there is an implicit assertion that indigeneity is real and fully formed, descended from its historical origin, and that certain markers can discern it (e.g. pre-colonial culture). In this way indigeneity is epistemologically bracketed as a categorical monolith and an empirical given or, that is to say, as an already constituted form.[12] As such, indigeneity is

[12] Writing to Joanne Barker on her popular blog, *Tequila Sovereign*, Wolfe, himself, urged, "what I'm attempting to analyze is NOT a fait accompli. Lest there be any mistake on this point, I'm careful to use words like 'seek' and 'attempt' when I spell out the settler logic of elimination" (2011). Despite Wolfe's own concern for representing colonial power as successfully eliminatory, I maintain that the teleological framing of SC as functioning through an eliminatory logic obscures analysis of the productive capacities of, for instance, those relations which are inconsistent, contradictory, and contingent among a paradigm of elimination.

treated as a fixed ontology that can be acted upon (e.g. eliminated, assimilated, included, reconciled, etc.), but lacks sovereignty in itself in the sense of being able to re/constitute the relations that produce it.

The way that Indigenous knowledge is culturally construed has practical effects in science and policy. In federal science policy-making and among some scientists in Canada, there is a growing willingness to *include* Indigenous cultural knowledge into research and evidence-based policy making (Institute on Governance, 2019). Its proponents tend to mirror the two above-mentioned orthodox assumptions about Indigenous knowledge as presented in Indigenous Studies: that Indigenous knowledge is cultural and inherently different from science, and that it is relevant to research and policy that addresses natural things (especially climate change). In my experience over the last five years of working with well-intentioned individuals such as these (as will be discussed in Chapter 4), the result of *including* Indigenous knowledge on the basis of these premises has resulted in focusing on creating "culturally safe spaces," and of using Indigenous knowledge to further support what knowledge deemed scientific has already proven. As I will discuss in the final chapter, the inclusion model in science and science policy that is predicated on culture and nature are ineffective in transforming the relations of coloniality that have created them.

Racialized/ing-gendered/ing Relations

Analytical emphases on culture have fallen under critique by others who understand indigeneity as being produced through and productive of struggle between competing logics and material contexts. Moreton-Robinson (2015) contends that the way that the discipline has grown around an analytic of Indigenous cultural identity/difference sacrifices analyses that expose the

racialized/ing-gendered/ing of colonialism's discursive regimes and through which "indigeneity" and "culture" have been epistemologically made possible in the first place. Others, including me, agree that racialization and gendering have been constitutive of colonialism and colonialism has been, in part, constitutive of the sciences that produce(d) race and gender: they have been, in other words, relationally formed (Doerfler, 2015; Andersen 2014, 2011; TallBear, 2013; Kuanui, 2008; Hall, 1995; Said 1993 & 1978).[13]

The racialized/ing-gendered/ing epistemologies generative of indigeneity, in its various scientific, political, and juridical iterations, are, according to Moreton-Robinson (2016), the ontological condition of possibility for cultural identity/difference and, importantly also, *patriarchal white sovereignty* (in Anglo-First-World colonial countries). Effectively, racialized/ing-gendered/ing re/iterations reorder Indigenous peoples relations to territory and political jurisdiction as possessive claims and as being in opposition to the patriarchal white entitlement, propertied possession, and political control in North America, Australia, Hawai'i, and Aotearoa/New Zealand (Christie, 2011; Harris, 1995).

Moreton-Robinson (2001, 2004) describes *patriarchal white sovereignty* as a regime of racialized/ing-gendered/ing power relations that are the direct result of Indigenous dispossession. She describes racialization and gendering, in particular, as productive discursive regimes constitutive of patriarchal white sovereignty that operate in the interests of white possessiveness and a will to control the terms on and through which life/death are defined and ordered within

[13] Another critique that has been made by Andersen (2009) suggests that analytical foci on itemizing Indigenous differences act to foreclose rather than create space for the *densities* characteristic of the "less schematic livedness" (92) of Indigenous realities; and, further, that "laundry lists" (Andersen, 2014, p. 16) detailing Indigenous differences render Indigenous peoples vulnerable to non-critical observers quick to require Indigenous peoples to remain within the parameters of that specified difference.

colonial formations. Conceptually, *dispossession* refers to the translation of land to property, the acquisition of Indigenous lands by invader states, and the manifestation of monopolized legal and political power over those lands (Nichols, 2017; Moreton-Robinson, 2015; Coulthard, 2014). These forms of power are exercised through and reproduced by Canadian sovereignty, whereby the nation-state and its juridical system claim possession and governing authority over its specified boundaries and citizens (Moreton-Robinson, 2004, p. 6).

Patriarchal whiteness is not simply demarcated according to phenotypic perception, but refers collectively to those portions of the population who have been born into the legacy of power and possession of the nation-state left by early colonial administrators. In Canada, it was from those men, like Sir John A. MacDonald, Wilfred Laurier, William Lyon MacKenzie King, and Robert Borden (all Prime Ministers), where the language of patriarchal whiteness was used to proclaim that the nation was to be a white man's country (Dua, 2007; Roy, 1989; Greer, 1987). Goeman (2013) joins Moreton-Robinson is describing the Americas as a spatial construction that is naturalized as a white space (p. 2). Territorial possession is co-produced with conceptions of white and native embodiment, and within this scheme, "[d]efining "Indian" in a settler colonial society is pivotal to marking and naturalizing settler citizenship" (Goeman, 2013, p. 47). Byrd (2011) expresses this argument as it proves relevant for framing global politics as well: "racialization and colonization should thus be understood as concomitant global systems that secure white dominance through time, property, and notions of self" (p. xxiii). Kauanui (2008) focuses instead on more local contexts that exemplify this same link between the racial construction of native hawaiianness according to blood quantum and the nation-state infrastructure that would use it to limit Kanaka entitlement to land and sovereignty (p. 9). The basis of these arguments suggests that colonial countries, like Canada, possess stolen Indigenous

lands by continually racializing (and gendering!) indigeneity and, in turn, gendering and racializing the norm of nation-state possession – that is, patriarchal white sovereignty.

Configured as "in and of the land" (Moreton-Robinson, 2015, p. xxii), Indigenous bodies are deemed a white possession themselves within colonial regimes. For example, Reardon and TallBear (2012) explain that human DNA gets framed by geneticists as "natural," and thus what follows is a white claim to property over it (DNA) and them (Indigenous bodies) for the purpose of research (p. S234). Colonizers and their descendants therefore have a property interest in and possessive claim of Indigenous bodies. Classification through racialized/ing-gendered/ing markers like blood and DNA are deeply anchored by a white possessive logic (Moreton-Robinson, 2015). You cannot name something unless you believe that it is yours to name.

I am interested in extending the work of Moreton-Robinson to consider also the relational production of patriarchal white sovereignty and other discursive fields (she focuses on law), including, particularly, the scientific field. Colonialism, I maintain, involves the re/production and regulation of bodies deemed *Aboriginal*, *Native American*, or *Indian*, etc.; the meanings of these terms are re/iterated in a number of fields of knowledge production constitutive of colonialism (ie. not only the legal field and the field of sovereignty); and they stand in tension with, and at times contribute to, the rearrangement of Indigenous meanings and practices of peoplehood. It is through the *reordering*, then, rather than the *elimination* of Indigenous relations to self, place, and kin and thus our peoplehoods that colonialism continues to operate (Tuck and Yang, 2012; Huhndorf and Suzack, 2010; Bastien, 2004; Anderson, 2001).[14]

---

[14] Remarking on a 2015 American Studies Association presentation given by Alyosha Goldstein titled, "The Settler Colonialism Analytic: A Critical Reappraisal," Kanaka Maoli scholar Kēhaulani Kauanui (2016) indicates that the folding of Settler Colonial Studies (SCS) into Indigenous Studies and other disciplines[14] often includes "shallow references to the theory." Patrick Wolfe, who according to Kauanui (2016), is often credited with creating the field, SCS,

While we can say that patriarchal white sovereignty conditions possibilities for the overall field of colonial power, there is an analytical imperative (if we are to identify the specific logics and empirical conditions which re/iterate indigeneity) to delve deeply into the fields that generate relatively large volumes of authority and influence that extend beyond their locales of creation. Moreton-Robinson's theory of patriarchal white sovereignty, like much of Indigenous Studies scholarship regarding race, emphasizes the role of law in constituting colonial sovereignty. As a discipline, we seem to pay remarkable inattention to the biological and physical sciences (and how they are linked to fields of law and sovereignty) that re/order our places and our relationships to and in them. We levy critique of, for example, capitalist resource extraction, discrepancies in healthfulness, or environmental degradation, but pay little attention to the technosciences that are enabled by and enabling of those forms of embodied and territorial dis/possession. There is not enough analytical concern devoted to understanding the relational production of Indigenous dis/possession and the scientific field outside of acknowledging the

---

but was careful not to claim this title for himself, also remarked that most scholars simplistically "assume that settler colonialism refers to colonies that have European settlers in them" (Wolfe, 2011: n/p). Kauanui and Wolfe identify how frequently SC gets conceptually applied, but not theoretically engaged with. Such shallow references have added up to what has become a settler colonial analytic. SC is said to be animated by a settler desire to see Indigenous peoples vanish (Cavanagh and Veracini, 2017) be it through death, amalgamation, or replacement (Morgensen, 2011, p. 52). Cavanagh and Veracini's interpretation of the settler colonial will-to-eliminate indicates one of the field's main principles: Wolfe's (2006) frequently cited logic of elimination.[14] Kauanui (2016) importantly notes that Wolfe's (2006) essay, "Settler Colonialism and the Elimination of the Native," in which he contrasts the settler colonial logic of elimination with genocide is often cited as the principal work representing the concept and theory (SC). I understand the logic of elimination as epistemologically structuring a dominant settler colonial analytic - the discursive formation that has generated erudition among the internal debates of SCS - that is not neutral in effect, but rather, operates as a powerful technology itself insofar as it generates a representative formation outlining a pathway to understanding power in spaces its user deems settler colonial.

racialization-gendering of indigeneity through Enlightenment logics and the sciences that they bred (e.g. Sturm, 2002, p. 53; Backhouse, 1999, p. 5). This is problematic, not least of all because contemporary global relations of power are being increasingly driven by flows of technology and scientific knowledge, but because *they always have been* in colonial contexts, whereby bodies deemed Indigenous have been naturalized as objects of research and where notions of bodily purity have always conditioned the possibilities of territorial/political dis/possession. As a field whose authority and legitimacy as well as relative autonomy operates similarly to the juridical field, the scientific field (discussed below) must be scrutinized more systematically.

When I talk about the relational production of colonialism and the scientific field, I do not only mean the ways that governments draw on scientific data or the ways that governments fund scientific research. I am also talking about how these fields have emerged together in their shared interest in legitimizing patriarchal white knowledge and sovereignty over others, and their connection to the possession of territory in the re/iterating of place and bodies. The linking of knowledge production with possessive relationships to bodies and territories is paramount in the critical theorizing of indigeneity, science, and colonialism. For this reason, I think of the colonial field of sovereignty and politics in relation to the scientific one for evidence of their shared investments in patriarchal white possessiveness that have always (since Europeans made homes of Indigenous territories) contributed to their mutual expansion.

In a collective disdain for biological determinism, social science disciplines have gone far the other way as to become epistemologically oriented in social determinism (e.g. sociology), economic determinism (e.g. Marxism), political determinism (e.g. political science), or cultural determinism (anthropology), etc. Overwhelmingly, engagement with gender and race in

Indigenous Studies comes from predominantly social constructionist frameworks that leave the material effects on the order of and within bodies to the litterbins of positivism and pseudo-science. There are two dominant moves that occur within this pattern of thought. One, there is a critical rejection of the biological existence of gender and race, which are described, instead, as social constructions or as the products of a pseudo-science used in the justification of colonial nation-state-building (Doerfler, 2015; Gaudry, 2015; Palmater, 2011, p. 183; Awang, 2000). This formalist approach represents science as a totality and attributes autonomy to scientific practices in their internally directed construction of the social world. Two, "science" or the "scientific community" is written into existence as a unified entity or monolith (Leroux, 2017; Munsterhjelm, 2014, p. 5). This is an instrumentalist approach that represents science as a mere reflection of existing social realities, and ultimately as a tool used by dominant groups to maintain those realities (Bourdieu, 1987, p. 814).

The way that gender and race are described as social constructions and real only to the extent that they are used to structure *social* relations with material consequences, requires further nuancing. For one, by bringing the scientific field into analytical conversation with the fields of law and sovereignty, the map of racialized/ing-gendered/ing relations generative of indigeneity in its various iterations, looks differently than social constructionist accounts. For example, biological races do not inherently exist (Koenig, Soo-Jin Lee, and Richardson, 2008, p. 1), however, the ways that people have been divided and treated differently on the basis of race does differentially impact the biology of bodies – even the genome (Sullivan, 2013). Perceptions of physical difference that lead to social categories of race are being inscribed into the materiality of bodies (this will be explore in Chapter 4 with respect to tuberculosis), and so it is necessary to

not only critique race as a social construction, but to critically consider the ways that it orders bio-relations between bodies, and also *within* them. Races are real.

Two, when race and gender were produced, they were not pseudo-scientific at all but, rather, they were products of scientific knowledge of its time properly speaking. I argue that it is unhelpful to distinguish between scientific and pseudo-scientific productions of indigeneity because doing so implies that there is a unity and singularity in the intent and practice of so-called real or good science; and that an authentic or pure way of doing science actually exists through proper method or by 'doing it right.' The appearance of science as a unified field built through observance to ideals of validity and reliability, neutrality and objectivity, rather than as being constituted through "a plurality of principles, knowledges and events" (Smart, 1989, p. 4) contributes to empowering the discursive effects of science. Additionally, there are methodological implications of framing race science as pseudo-science and the myriad relations that makeup scientific fields as a monolith. For example, Stepan (1982) shows that, "[t]o dismiss [the work of former race scientists] as merely 'pseudoscientific' would mean missing an opportunity to explore something important about the nature of scientific inquiry itself" (p. xvi) – that it is, like other forms of knowledge production, contingent. Likewise, DeLanda (2002) argues that instead of taking science for granted as an abstract totality, "we must strive to identify the specific processes which have given rise to *individual scientific fields*, which like any other individual, must be conceived as composed of populations of entities at a smaller scale" (pp. 117-118). I propose Pierre Bourdieu's *scientific field* (expanded below) as having the conceptual ability to circumvent the discursive pitfalls of formalist and instrumentalist monoliths of "pseudo/science."

Relations Theorizing Relations

On a warm winter day on a sand island off the coast of Australia, on the ancestral lands of the Quandamooka people, Professor Moreton-Robinson reached up to hang the freshly bleached linen she had just washed. As I joined her in shaking out and then lining up each piece, we seamlessly conjoined our movements with the yarn we had been having over tea and cigarettes for what must have been hours. That morning I was lost in Prof's stories of endurance that have been required of her and the other warrior women that keep Geonpul families connected to the places and relatives from which they emerged, and which cohere them as a people. That day, governance took place among the linen that danced between us and moved by the sea breeze. Her stories resonated with mine of family and home half a world away. I saw in them a likeness construed through the fiery collisions of British and then liberal democratic styles of colonialism and that met the fierceness of Indigenous women's fortitude. And over time, as Prof went on to teach me about political theory and its discursive technologies *that constrain Indigenous presence by enabling our presence as Indigenous* (a central tenet of this research), she simultaneously accessed the medicine of her ancestral waters on land and of sea in a way that I am only now beginning to understand was in the brilliant layering of Geonpul sovereignty. Through our relating, she gifted me with nodes of her embodied connection through which I could understand the worlds that I inhabit and that I am required to inhabit, and even how those worlds shape the ways I understand inhabiting. With that set of relations came the empowerment and responsibility to take up, in her estimation, intellectual arms on the battlefield where so-called truths are birthed about and used, intentionally or not, to control us: the forever peoples of our territories.

Distinguished Professor Aileen Moreton-Robinson's work originally compelled me as a Masters student some years ago when I analyzed the judicial and legislative fields that rely on

technologies of biological sex and heteronormative coupling, in concert with the racializing logic of blood purity to normalize patriarchal white sovereignty in Canada vis à vis the establishment of (Canadian) personhood in contradistinction to Indianness (Kolopenuk, 2012, 2014). In what was an effort to simply understand the shifts in *Indian Act* policy throughout the 20th and 21st centuries, Moreton-Robinson's conceptual synecdoche of patriarchy, whiteness, and possessiveness allowed me to articulate the inextricable link between the sovereign assertion of possession over territory and bodies in and of them; the forging of a modern legal system by and for the interests of white male subjectivity; and the perverse reordering of Indigenous peoplehoods through the administrative regulation of bodies deemed Indian. But, as I have since begun to notice that as powerfully explanatory as her analytic of conceptual inter-reliance is, the reciprocally racialized-gendered composition of white possessiveness is under-engaged among work that applies Moreton-Robinson's theorization (e.g. Andersen, 2014). Moreton-Robinson predominantly gets taken up with regard to her theorization of the ontological status of whiteness in making Indigenous dis/possession possible. I would like to extend this analytical direction by remembering that her corpus has extended out from her first and pathbreaking book, *Talkin' Up to the White Woman,* in which she gave the Women and Gender Studies world (and well beyond) a direct critique of white feminism's investment in and discursive maintenance of Indigenous dispossession. Perhaps it is not odd that the patriarchal of patriarchal white sovereignty gets dropped at times in Indigenous Studies insofar as its omission from analytics of colonial power *is* patriarchy at work.

In September 2018, I was asked to be on a panel engaging Moreton-Robinson's most recent book, *The White Possessive* at the University of Alberta. When contemplating the panel, I did not particularly want to ruminate on the weight of the patriarchal will-to-control the

contingency that he (sic) calls "nature," of which Indigenous bodies are often relegated because it has too often become expected that an Indigenous woman, or queer, or trans person - basically anyone who is not a cis, hetero, white or white coding male will be the one to do this work – the work of working out not the categorical intersections of distinct entities – gender and race, patriarchy and whiteness, and in my work, science and politics – but of articulating the oneness of embodied and emplaced relations of dis/possession. However, as I saw it, I could not speak of what I see as the unity (not synergy) of race/gender when being asked to speak about Moreton-Robinson's work. How can I speak of the disciplinary and biopolitical aspirations of state-craft and modern scientific orthodoxies that share in their interest in patriarchal white possessiveness when both have worked so hard to construct themselves as knower, owner, and ruler? Patriarchal white sovereignty, as Moreton-Robinson explains, operates through the epistemological *a priori* of white possessiveness, but so too are racialized/ing-gendered/ing technologies of dispossession emergent from the juridical, scientific, and discursive teleology that links reason (and therefore the natural right of personhood to know, to rule, and to own) with the embodiment of the patriarch. Historically only he could possess and now, anyone one else who can, does so in his image.

None of us can forget to engage race/gender when being asked to speak about Moreton-Robinson's work in its fullness. For the conjuring of *things* as discrete entities that can be popped in and out for the sake of an analytical imperative - race and gender, whiteness and patriarchy, science and politics and the clunky mathematics of their generative intersections - conditions possibilities of thought and politics in the fields that I critique including the genome sciences of biomedical research, physical anthropology, and forensic science policy that are

increasingly re/iterating indigeneity in racialized/ing-gendered/ing concept and body. Alas, however, I land exactly where we all still do.

My own attempt to think race and gender together is itself intimidatingly limited and limiting. It does not, for example, directly address how bodies are also sexed/ualized, or how they are also deemed dis/abled, or how they are also intersected by class and capital, or... Like bodies, concepts are not perfect. My effort to analytically articulate race-gender is my own initial step toward the breakup of purities (conceptual, embodied), or at least the perception of them. But this is dirty work – the complexities of which ought likely to instead be left to dynamically expressive practices beyond the words' page.

Fielding Science

Pierre Bourdieu (1991) has argued that, more than in any other area of intellectual life, are conceptions of science reduced to either an internal analysis: an absolutist-idealist conception that views "scientific practice as a pure activity completely independent of any economic and social structures" (p. 4) or as an external analysis, a historical-relativist conception that views science as being "a direct reflection of economic and social structures" (p. 4). Both options, he says, are tantamount to what could be an oblique reference to Piaget – to "the genetic mode of thinking" (p. 4). The epistemological consequence, Bourdieu maintains, is that we can either only see science as describing or expressing natural phenomena exactly as it (or most closely to it); or as wholly socially constructed. For Bourdieu (1991) and others (Albert and Kleinman, 2011; Albert, et al., 2008, 2009; Cooper, 2009; Fourçade, 2009; Hong, 2008; Kim, 2009) who have taken up his work in studies of science and technology, the genetic mode of thinking reduces "the space of theoretical possibilities to pairs of elementary oppositions, outside of which there is no conceivable position" (p. 4).

Bourdieu (1991) posits instead the *scientific field* as "a system of objective relations between positions already won (in previous struggles)" (p. 19). In a Kuhnian disposition, Bourdieu asks, under what conditions do certain scientific ideas come into being? Scientific knowledge is created not as something entirely new, but as "refracted" (Andersen, 2011, p. 49) ideas, methods, problems and mediated through the mental/material technologies that exist and circumscribe the potentialities of knowledge production in a historically-located specificity and the resources that one is able to access to do such work (Bourdieu, 1991, pp. 10-11). Simply, it is complicated. Bourdieu likens the scientific field to a public city, but which has extremely strict entrance requirements that are at least, in part, determined by competitive relations between agents and institutions that are invested in the field's legitimacy.

To say that the agents share an investment in the scientific field is not to say that they make up a united community as such, but it is to say that as they struggle with and against each other, they nonetheless share an inclination to *do* science and *a feel* for doing it. The dividends sought after for one's investment in the scientific field is a specifically-articulated scientific authority – for your research to be designated as authoritative on a given topic – a seal of scientificity, so to speak. Bourdieu writes: "The definition of the stake in the scientific struggle (notably the delimiting of the problems, the methods, and the modes of expression that can be deemed scientific) is also a stake in the scientific battle" (Bourdieu, 1991, p. 14). Further, the institutional mechanisms of the field are of great importance in the field's reproduction insofar as the "social and academic selection of legitimate scholars…the training of the agents selected, and control over access to the instruments of research and publication" (pp. 8-9) are concerned.

The "who" of science matters. Those who are able to accumulate legitimate standing within the field and between it and other fields is, in a lot of cases, determined by the degree to

which they buy into scientific orthodoxies. For example, because the scientific field, in Canada, was coterminous with the dis/possession of Indigenous peoples, to enter the scientific field requires one to at least minimally invest in the field's own interest in patriarchal white sovereignty. Whether individual scientists themselves want to challenge patriarchal, white, heteronormative, or ableist knowledge, for instance, they still need to contend with the objective structural relations that have created a scientific field and that which are relationally maintained with patriarchal white sovereignty.

Bourdieu's *scientific field* is useful for my purposes in considering that genomic indigeneities look differently among different sets of relations among/of the scientific field. For example, the way that a paleoanthropologist conceptualizes indigeneity in terms of "Native American DNA" to map human migrations is different than a lab technician sequencing microbial DNA for medical testing in clinical practice, which is altogether different from the way that a teenager might think about genetic mutations after watching an X-Men movie. For this reason, I position science, not in terms of a solid and uniform entity, but in a Bourdieuvian disposition, as a scientific field dynamically re/constituted through hierarchical struggles between structured and structuring agents and relations of power (Bourdieu, 1991, 1975). This will not be a comparative study of cases, but a conjuring of the scientific field's relationality: how it exists in relation. A field analysis cannot predict the trajectory of a given field, but rather calls the analyzer to appreciate the contingency of a field's structure in order to identify productive opportunities to manipulate its relations. Precisely by conceiving of science in terms of a scientific field, the question arises about how we might alter its structure? How do we divest science of its interest in the possessiveness of patriarchal whiteness?

While you now have a sense for the clusters of relations directing the following chapters, those that will be made sense of in terms of conceptual signalling ("re/iteration", "racialized/zing-gendered/ing," "patriarchal white sovereignty," the "scientific field,") we both know that, in practice, cause-and-effect are not typically bound together in neat and linear pathways. As such, even, and maybe, especially, when we use critique and attempt to disaggregate the forms according to which various sets of relations exist, we unwittingly add to their force. Realities are always far more complex than our conceptual language can handle, yet capture we do, freezing "realities" in time/space by writing them into existence. What other option do we have?

Chapter 2

Star Women Unseen: The Molecular Visibility of Female-Indigeneity and Canada's Missing Persons DNA Program

In this chapter, I analyze the relations of violence generative of Canada's National Missing Persons DNA Program (MPP) wherefore female-indigeneity becomes seen and genomically re/iterated through the prism of forensic DNA profiling. The MPP was legalized on December 16th, 2014 after Bill C-43, *The Economic Action Plan 2014 Act*, No. 2., was passed by Parliament. Becoming operational on March 12, 2018, the MPP is part of a federal effort to nationally coordinate the organization of genomic data for missing persons so that 1) such data is accessible to police and coroners across jurisdictions, and 2) it can be cross referenced with roughly 500,000 DNA profiles in the National DNA Data Bank (NDDB) crime scene index (Public Safety Canada, 2018). Indigenous people are hyper-represented among missing and murdered persons in Canada (National Inquiry, 2019; NWAC, 2017; RCMP, 2014; Amnesty International, 2009, 2004). As such, their DNA risk becoming hyper-visible in the Data Bank.

Canadian policy actors have framed the Missing Persons DNA Program as both a pre-emptive and after-the-fact action against the policy-based problem of missing and murdered Indigenous women and girls – relatives collectivized as "MMIWG."[15] The federal government

[15] In my analytical focus on female indigeneity as it relates to the MPP, I am not purposefully ascribing and limiting gender to individuals among missing and murdered Indigenous people. Rather, I examine how "female-indigeneity" gets conceptually constructed and re/constructed through juridical and molecular visibility. Specifically, I refer to MMIWG in the context of its use by the federal government. Elsewhere, I refer to MMIWG2S to account for Indigenous women, girls, and also two spirit and transgender individuals negatively impacted by racialized/ing-gendered/ing violence. The purpose of this chapter is not to understand how Indigenous maleness and manhood are genetically constructed although this further study would be helpful in grasping how Indigenous peoples are gendered as men and boys through colonial politico-scientific regimes.

has touted the MPP, for example, as being necessary to provide closure for the families of MMIWG through the identification of their loved one's remains. I contend that, at the interstices of forensic DNA science and science policy, the MPP makes female-indigeneity molecularly visible *as "*MMIWG." The acronym, itself, collectivizes individuals as an administrative unit and a shorthand thrown into the mix of public policy problems. As I show, this iteration of indigeneity mediates a vision of closure in the disappearance and death of Indigenous people by funneling policy-based solutions into a narrow corridor of DNA profiling and identification. As such, the MPP is endowed with the power to see female-indigeneity in a way that matters, but which, and in effect, matters more for the biotechnological re/making of state-craft than it does for transforming colonial relations of violence. In this chapter, I argue that the federal government's partial justification for the creation of the MPP in the name of MMIWG re/iterates racialized/ing-gendered/ing power relations through which violence against Indigenous women and girls (and peoples more generally) is generated, and also through which the collection of DNA has become a specific response to such violence.

Globally, forensic DNA science is increasingly becoming a biotechnology (see Chapter 1) used to answer governance problems related to policing, incarceration, and missing persons recovery efforts. I argue that in Canada, forensic science policy as it relates to the MPP is emerging through the governance problem of MMIWG; and in this regard, the genomic re/iterating of female-indigeneity (a rhetorical policy-based solution to violence) is paradoxically building up the biotechnological capacities of Canada on the global stage. This, I argue, is occurring through three sets of relations: 1) a policy-based re/iteration of female-indigeneity as "MMIWG," through a discourse of over-representation; 2) national and transnational regimes of policy-making that re/iterate indigeneity through biotechnological control; and 3) the data-basing

of female-indigeneity from *Indian Act* governance to the MPP. I argue that the ontology of female-indigeneity formalized in the Canadian policy field as being biologically identifiable via the governing technology of an historic database (the Indian Register) has conditioned a policy paradigm that supports the use of a forensic biotechnology, not to eliminate violence against Indigenous women, girls, and LGBTQ2S, but to control the limits of what can be imagined as closure in their deaths.

Fielding Relations of Violence #1: Aligning Canada's National Missing Persons DNA Program with "MMIWG"

The National DNA Data Bank expanded in 2018 to include five new indices: two deemed "criminal" – a victims' index and a voluntary donors index; and three deemed "humanitarian" – a missing persons index, a relatives of missing persons index, and a human remains index. The missing persons, relatives of missing persons, and human remains indices make up Canada's National Missing Persons DNA Program. As Dr. Ronald M. Fourney, Director of National Services and Research of the Royal Canadian Mounted Police (RCMP) remarks "[w]hat distinguishes this [program] is…it's like a long-term mass disaster. You have a lot of missing people over a period of time" (2007). According to the National DNA Data Bank (NDDB) 2015-2016 annual report, the MPP "will introduce a national foundation and a collaborative resource that can be leveraged by police, coroners and medical examiners investigating cases that involve missing persons and unidentified human remains (RCMP, 2016). The MPP was originally planned to become operational in the spring of 2017, but due to the change in government, its launch was postposed to early 2018 in order to, according to the ministry of Public Safety (under which the RCMP falls), "review the program's service delivery model" (Crawford, 2017). At the time, the ministry did not expand on what this meant; however, following the MPP's launch, it

became evident that the review resulted in changes to the program's design. Among these changes was the centralized analysis of DNA at the RCMP's NDDB laboratory in Ottawa rather than at local and cross-jurisdictional locations (Public Safety Canada, 2018).

Changes to the NDDB date back to the Conservative Government under Prime Minister Stephen Harper. The legalization of the MPP, colloquially known as "Lindsey's Law," passed as part of a budget bill in 2014 and was publicly championed by the mother (Judy Peterson) of a missing British Columbia girl, who campaigned for over a decade to see it come into being. The MPP is the result of years of relations between advocacy and government deliberation. For example, while the Standing Committee on Public Safety and National Security was considering evidence regarding the creation of a missing persons index back in April 2007, Ms. Karen Sallows, Director of the Strategic Coordination, Research and Evaluation Division at Public Safety Canada cited the efforts of Judy Peterson (2007). Peterson, who has been consulted by various levels of government, had the opportunity in 2013 to sit down with Public Safety Minister Steven Blaney, Justice Minister Peter MacKay, and Minister of State for Finance Kevin Sorenson to make her case for the federally legislated and funded MPP (Blaze Carlson, 2014). Judy Peterson has had unmatched public access to senior government officials regarding the matter.

In 2010 the Standing Senate Committee on Legal and Constitutional Affairs published their final report called Public Protection, Privacy and the Search for Balance: A Statutory Review of the *DNA Identification Act*. The committee reviewed the creation of missing persons, unidentified human remains, and victims indices. Since in missing persons investigations, the collection of DNA typically becomes important when a missing person is presumed dead and human remains have been found, the report cites the power of "bringing closure to their families"

(Senate Canada, 2010, p. 76) as motivation for these indices at a national level. Among the list of witnesses that the committee consulted, there was no formal Indigenous representation, indicating that control over who and who is not present to deliberate over shifts in public policy concerning biotechnology may be a field of coloniality itself.

While Indigenous peoples have not been formative of the MPP by way of having a role in its governance, the justification for its creation would end up intersecting with the Government of Canada's *Action Plan to Address Family Violence and Violent Crimes Against Aboriginal Women and Girls*. One month prior to the tabling of Lindsey's Law, the federal government's Special Committee on Violence Against Indigenous Women issued a report, *Invisible Women*, recommending that the National Missing Persons DNA Program be created as a means of providing support for families of MMIWG (Ambler, 2014, pp. 37, 43). The report suggests that supporting families includes giving them the closure necessary in missing person cases and that this can be achieved by forensically identifying their loved ones' remains. This recommendation was then included into the *Action Plan to Address Family Violence and Violent Crimes Against Aboriginal Women and Girls* even though Lindsey's Law had already been tabled (Government of Canada, 2014, p. 13).

The recommendation that the DNA-based missing persons index was to be created echoed that from another notable report that preceded it - the *Report of the Missing Women Commission of Inquiry* in B.C., called *Forsaken* (2012), which inquired into police misconduct in investigations connected to the murders by Robert William Pickton. The Vancouver Police Department (VPD) fell under scrutiny following the Pickton case for its mishandling of missing persons cases from Vancouver's Downtown Lower East Side, a large proportion of which were Indigenous women. To improve the handling of missing persons cases, *Forsaken* advocates for

the collection of DNA of missing Indigenous women, and additionally, for the voluntary submission and registration of Indigenous women's DNA in the event that they happen to go missing in the future (Oppal, 2012, p. 129). Additionally, the Saskatchewan Provincial Partnership Committee on Missing Persons had also previously recommended in its *Final Report* in 2007 that ministers responsible for justice seriously consider how a voluntary national DNA database could be created (p. 58). Then in 2014, under pressure from Indigenous communities following the horrific systemic and interpersonal violence that culminated in the homicide of 15-year-old Tina Fontaine in Winnipeg, MB Peter McKay, then Justice Minister, remarked that with regard to addressing violence against Indigenous women and girls, an inquiry was not needed, but that other measures were, like the creation of the MPP (Rabson, 2014).

Concern for MMIWG did not become part of federal rhetoric in support of the MPP until a public discourse about the over-representation of Indigenous women and girls among missing and murdered in Canada intensified after the first decade of the twenty first century. The notion of over-representation would help align federal interests to generate support for the MPP and to demonstrate that it was taking actions to address violence against Indigenous women and girls. The policy-based alignment of the MPP and MMIWG through the discourse of over-representation point to a biotechnological dimension of what Nichols (2014) refers to (in his exploration of the hyper-incarceration of Indigenous bodies) as a logic of war in colonial relations.

I invoke and extend Nichols' (2014) argument that the over-representation of Indigenous peoples among institutional carceral expansion should be understood according to a framing of colonial imprisonment. He suggests that arguments that frame Indigenous incarceration in terms of "racial over-representation" lead to solutions geared at reducing the overall number of

Indigenous people who are incarcerated, but without addressing and transforming the colonial relations that lead to the imprisonment of Indigenous bodies by a colonial nation-state. I extend Nichols' argument by demonstrating that the frame of "Indigenous over-representation" among those missing and murdered in Canada lead to solutions geared at bringing the number of missing and murdered Indigenous women and girls to parity with the national average as if this number represented a normal or acceptable level of gendered violence within a given society. Over-representation is, then, a discourse, which normalizes acceptable rates of violence as a standard to reach; and it muds over the existing pathology relations that structures countries like Canada: those constitutive of patriarchal-white sovereignty. I invoke the prefix –hyper to describe the over-representation of Indigenous peoples who are incarcerated or missing or murdered as a response to Nichols' (2014) provocation.

Before the MPP became operational, there was precedent in Canada for the collection of DNA in missing persons investigations as well as for the pre-emptive collection of biological samples among populations deemed vulnerable. Attempting to improve police handling of cases like the ones that faced the Vancouver Police Department and with knowledge of the growing global trend among modern industrial countries of biological data basing in missing persons cases, the RCMP established Project KARE in 2003 in Edmonton, Alberta where sex trade workers were, like they had been in Vancouver, disappearing. Project KARE was a unit established to investigate and mitigate the serial disappearances and homicides of disproportionately female Indigenous sex trade workers in Edmonton. The unit became a reality, in part, because police had learned of the homicides of five sex trade workers indicating the possibility that a serial killer might have been targeting this population and its approach was informed by knowledge of the failures of the Vancouver Police Department to map such patterns

(McClearn, 2017); and the eventual use of DNA profiling to convict Pickton of six counts of second-degree murder.

A novel component of Project KARE's approach was the establishment of a biological registry of sex trade workers from Edmonton's strolls and became "regarded as a world leader" (Buckley, 2012, p. 37). Project KARE utilized a specialized major case management system, an electronic MCM (eMCM) system in which information about missing and vulnerable persons is contained and fanned out. The eMCM system was first developed by the RCMP to keep track of over 100,000 exhibits associated with the Swiss Air Flight 111 disaster in Nova Scotia (Buckley, 2012, p. 39). It is common for mass loss of life events to catalyze advancements in forensic DNA science at national levels. This is just as true for events of mass disaster as it is for the "genocide" (National Inquiry, 2019) -level of violence committed against Indigenous women and girls in Canada. For example, the violence experienced by unknown numbers of Indigenous women and sex trade workers and the destruction of their bodies by Pickton contributed to the need for DNA profiling in the identification of his victims and evidence amassed against him. Forensic DNA capabilities within the Canadian policy field were refined and generated value. And so, for roughly a decade the RCMP on behalf of Project KARE collected hair samples in Edmonton from individuals they deemed vulnerable.

Project KARE team member, Corporal Joe Verhaeghe explains in Rosie Dransfeld's (2012) documentary, *Who Cares?* that the approach of collecting hair samples from individuals before they go missing was aimed at the goal of harm reduction, which does not, he made clear, make anyone any safer, but rather, allows police to identify human remains in, "the tragic event that something happens." Project KARE grew out of interest in developing targeted action to protect individuals from becoming victimized, but additionally, to locate and prosecute

individuals responsible in cases where victims had been harmed. When I contacted the RCMP regarding Project KARE and its collection of biological samples, I was informed that information would not be shared about the consent form used in these collection practices. Limiting public access to such information is a sovereign expression of the colonial rule of law and indicating that administrative control outweighs public transparency. I did learn, however, that presently, there are no plans to profile the samples for entry into the National MPP indices (Leander Turner, personal communication, December 2, 2016).

Despite its best intentions and novel approach, a *Globe and Mail* investigation into violence against Indigenous women and girls revealed that, in fact, Project KARE was largely unsuccessful, only identifying a tiny proportion of Edmonton's female homicide and missing person cases (McClearn, 2017). Further, through the efforts of Project KARE, the translation of DNA evidence to conviction was limited. A line from the *Globe and Mail* investigation report reads, "[t]hirteen years after the project began, the results visible to the public are hardly encouraging: two murder convictions and dozens of unsolved crimes, many of which occurred under KARE investigators' noses" (McClearn, 2017). In this case, colonial relations of violence seemingly strengthened biotechnological-oriented methods among Canada's federal constabulary, but without making life safer for Indigenous people in Edmonton.

The influence of the Pickton case on local responses to serial disappearances and now used in the justification for the MPP, violence against mostly Indigenous women has acted as a justification in Canada for developing federal policy and infrastructure related to forensic DNA science. Indigenous peoples, themselves, however, have been cautious about the Missing Persons DNA Program. In 2014, the Native Women's Association of Canada (NWAC) issued a press release in response to the Conservative Government's *Action Plan to Address Family Violence*

and Violent Crimes Against Aboriginal Women and Girls, stating that it was a good starting point, but that the lack of a solution-based approach to violence was not sufficient and they stressed the importance, not of the MPP, but instead, of a National Inquiry (Native Women's Association of Canada [NWAC], 2014). Further, the 2015 and 2016 National Roundtables on Missing and Murdered Indigenous Women and Girls, which gathered families of lost loved ones, Premiers, federal, provincial and territorial ministers, the Assembly of First Nations, the Congress of Aboriginal Peoples, the Inuit Tapiriit Kanatami, the Métis National Council, the Native Women's Association of Canada, Pauktuutit Inuit Women of Canada, and Les Femmes Michif Otipemisiwak/Women of the Métis Nation in Winnipeg, Manitoba did not identify the MPP in its priorities for action (2016). It has not been Indigenous peoples who have primarily pushed for the creation of the MPP. Rather, the federal government has represented it as something that it is doing for the benefit of Indigenous peoples - a seemingly contemporary form of humanist paternalism that has historically laced colonial policy-making. As senator Pierre-Hugues Boisvenu is reported to have stated in 2014, the MPP will "help solve many missing cases including those of aboriginal women and children" (Roberts, 2014).

Fielding Relations of Violence #2: National and Transnational Governance through and of Forensic DNA Science

Science policy is commonly divided into two central domains: "science for policy," which pertains to the policy infrastructure and uses of scientific knowledge in public decision-making (for example, evidence-based decision making, or science advice), and "policy for science," which deals with the roles of research and innovation and the creation of knowledge in a given society (such as funding for research and universities) (observation May 7, 2017). My

research indicates that there is a third dimension at the interface of science and policy: how nation-states use science and technology to directly govern citizens.

An example of governance through science and of science is, as the chapter's topic indicates, the use of DNA profiling in government-sponsored forensics. The profiling and data-basing of DNA in forensic science is a characteristic feature of modern nation-state making in its domestic and international use, particularly in criminal investigations and for logging the personal information of criminal offenders. As Dr. Frederick Bieber (2006), associate professor of pathology at Harvard Medical School and Advisory Committee member of Canada's National DNA Data Bank writes, "[m]ost industrialized nations now collect biological samples from crime scenes and from those convicted of serious crimes for entry into government DNA data banks" (p. 223). Forensic DNA profiling is used in the identification of suspects and to be presented as evidence in efforts to convict or exonerate an accused or convicted criminal (Kahn, 2012, p. 114). In the realm of criminal prosecution and exoneration, DNA evidence is often declared as "unassailable [and] definitive" (Duster, 2012, p. 2).[16] In addition to use in policing and incarceration, forensic DNA profiling is used by nation-states for purposes of "civil paternity testing, immigration and probate disputes, missing persons recovery efforts, and for reunification of human remains in the aftermath of mass disaster or war" (Bieber, 2006, p. 223). Advances in genomic biotechnologies, including those used in forensic science have, for the countries that develop and use them, necessitated the creation of policy dealing with the use of DNA in governance. Canada is no exception.

[16] For historical accounts addressing how DNA fingerprinting has come to dominate the monopoly on what is considered definitive evidence in crime and missing persons investigations, see (Lynch et al., 2008) and (Kahn, 2009).

Legalized in 1998 and in effect as of 2000, Canada has had its National DNA Data Bank (NDDB), stewarded by the RCMP and housed at the force's headquarters in Ottawa, Ontario. The NDDB Advisory Committee, appointed by the Solicitor General of Canada, oversees the effectiveness and efficiency of the Data Bank. Currently, the Committee is composed of experts in legal, scientific, constabulary, and bioethical fields. At the time of writing, there was no Indigenous representation on the NDDB Advisory Committee. The NDDB currently has two indices: one that contains the DNA profiles of offenders convicted of a designated offence, and the other for DNA collected at crime scenes. Canada's NDDB operates with the use of the Combined DNA Index System, (CODIS). CODIS is a software program developed in the United States and is now provided at no cost to the RCMP by the U.S. Department of Justice and FBI (Royal Canadian Mounted Police [RCMP], 2003, para. 2). The CODIS system tests a multiplex of thirteen genetic loci in addition to a sex test in the probabilistic genetic identification of individuals (Jobling and Gill, 2004, p. 743).[17] It has become an international standard in the analysis and storage of DNA data in forensic science (Kahn, 2012, p. 126).

Collaboration between Canada and the U.S. with respect to forensic DNA governance is relatively standard. The RCMP and FBI routinely share DNA data, such as in the 2003 case in which DNA was used to connect Thomas McCray who was serving a prison sentence in Canada to a sexual assault and homicide case in Ohio (The National DNA Data Bank of Canada, 2002-

[17] When comparing DNA samples in forensics, very rarely, if ever, whole genomes are being compared. Instead, portions - specific loci - where there tends to be variation among individuals, are profiled. When comparing the samples, a statistical formula must therefore be used to estimate how often such a profile would likely appear among a reference population. Such estimation is used to place confidence limits on the DNA comparison for a match. A DNA "match" in forensic science is always necessarily probabilistic rather than absolute (Kahn, 2012, p. 117; Lewontin and Hartl, 1991, pp. 1745-1746n; Cho and Sankar, 2004, pp. S8-S9).

2003, p. 34). Facilitated by INTERPOL Canada, McCray was deported and prosecuted in the U.S. following the completion of his Canadian sentence.

As we have seen, forensic DNA analysis has become a useful tool in the identification of missing persons and human remains (set of relations of violence #1) and, as it is becoming apparent, a prominent technique of further transnational collaboration. Large-scale DNA-based identification projects have been created to, for instance, find some of the 8960 missing persons killed during the military dictatorship in Argentina from 1976 to 1983 (Corach, et al., 1997). Additionally, following conflict during the break-up of the former Yugoslavia, the International Commission on Missing Persons (ICMP) was established in 1996 to identify the over 30,000 persons who had gone missing or had been killed during its series of conflicts. It has been said that "while mankind has been able to map the human genome, the ICMP [International Commission on Missing Persons] is using DNA technology to map a human genocide" (Huffine, Crews, Kennedy, Bomberger, & Zinbo, 2001). The ICMP's coordinated effort to identify such a large number of people also provides its DNA sequencing capabilities, in some cases, to other national and international bodies.

In fact, collaboration between the RCMP and the ICMP led to the identification of an Inuit woman from Nunavut, Mary Rose Keadjuk, who went missing in Yellowknife in 1990. The national technologies available to the RCMP left them unable to extract DNA from a bone fragment found in 2003 in the Con Mine area of Yellowknife after having attempted on three occasions and in different labs; their own as well as at the University of Alberta (Bird, 2018). The RCMP applied to have the fragment tested by the ICMP in Sarajevo. With superior forensic capabilities, the ICMP was able to extract DNA and identify a familial DNA match with relatives of Mary Rose Keadjuk (Bird, 2018). In its use for identifying missing persons, forensic DNA

science is often deemed a matter of humanitarianism and prioritized in response to mass loss of life events and post-conflict violence. Massive coordinated efforts have been prioritized and undertaken in global locations where extreme violence has led to large-scale loss of life. In this case, DNA analysis was also used to identify an individual woman who went missing under suspicious yet unknown circumstances, but without addressing the link between Mary Rose and the the genocidal proportion of violence against Indigenous women and girls. While in public policy rhetoric, missing and murdered Indigenous women and girls are re/iterated homogenously as "MMIWG" and used as justification for biotechnological changes to science policy; in practice, within the field of DNA forensics, the disappearance, death, and identification of Indigenous women and girls is treated on an individual case-by-case basis rather than in terms of a systemic pattern of colonial warfare.

The sharing of DNA data between nation-states, like in the discrete case of Keadjuk, is an international norm that acts as a sort of webbing that links nation-states together and standardizes best practices in DNA handling, analysis, and data sharing at the global level. In 1998, the International Criminal Police Organization (INTERPOL) DNA Unit was established in Lyon, France. The Unit is meant to develop globally recognized best practices in forensic science, assist member states in their use of DNA forensics, and to advance international cooperation in the usage of DNA in criminal investigations, missing person cases, and identification of human remains (International Criminal Police Organization [INTERPOL], 2018). The collaboration and coordination between international groups, including academic and state-sponsored institutions have contributed to the relatively rapid development and acceptance of DNA-based technoscientific practices in forensics (Jobling and Gill, 2004, p. 742).

Through the mutual recognition between nation-states of each other's borders, juridical systems, and constabularies that the sharing of DNA data necessitates, forensic science re/consolidates the legitimacy of certain (bio)industrialized nation-states that tend also to be colonial within the rubric of nation-state sovereignty. Transnational recognition also opens up flows of biotechnological control in which the surveillance of bodies is expanded beyond the geopolitical boundaries of the nation-state. Advances in genomic technologies, including those used in forensic science, have altered the institutional and juridical landscape of mostly modern industrial nation-states *domestically* by necessitating the creation of policy relating to the use of DNA and, also, in terms of the *relationships between international bodies*. The scientific field, which operates through global networks of knowledge production means that coloniality also tends to rely on movement between the domestic and transnational levels rather than bounded bordered nation-states.

According to forensic experts, however, the effectiveness of DNA data banks in convicting offenders and locating missing persons is, itself, not fully known (Bieber, 2006). As such, policy-based and scholarly investigation of DNA forensics tends to focus on the scientifically procedural and technical aspects of the field, including, how to improve efficiency and accuracy of DNA profiling and matching (Kahn, 2012). The biotechnological relations (e.g. the way that Indigenous peoples get administratively condensed into populations, such as "MMIWG"), within which forensic DNA science is situated and which produce and circumscribe the movement of bodies within and across borders are left overwhelmingly un-scrutinized. There are, however, outliers.

In response to the biotechnological relations of control that see and manage bodies unevenly, there is scholarship that has investigated ways that race is structurally built into nation-

state systems of forensic DNA science where policing and incarceration are concerned, and thus how nation-state-sanctioned uses of forensic DNA science contribute to geneticizing criminality (when genetics and criminality become correlated). Kahn (2012), for example, shows how the DNA of an individual becomes racialized when it is unnecessarily compared against categories of racial populations rather than a generalized population in determining the statistical likelihood of a random match probability; Sankar (2012) has considered how DNA is used to shoddily deduce the phenotypic appearance of a suspect in a process called DNA phenotyping; Duster (2012) further discusses the aligning of rates of race-based over-representation in incarceration with DNA profiles in government indices for criminal offenders; and as Jabloner (2018) explains that allegedly "race-neutral" DNA databases, like California's criminological database (CAL-DNA), tend to catch men of colour in a historically racist criminal system. As Kahn (2012) notes, there is far more consideration of the technical and methodological practices used in forensic DNA science than of the racialized (and, I would add /ing-gendered/ing) categories and politics embedded in their use. The underlying assumption, he maintains, is that forensic DNA practices require scientific technical expertise, while race remains perceived as being commonsensical. While these analyses of the racialized implications and biases in DNA profiling and data-basing prove useful for understanding criminal indices, less considered are newer humanitarian indices (for an exception see Nelson, 2012).

Even where scholarship concerning DNA forensic science has included critical race analyses, indigeneity is not typically figured into normative critiques of forensic science, especially as they relate to the colonial constitution of nation-states and transnational relationships of coloniality through DNA data-basing and sharing. There remains too little scholarship that engages contemporary biotechnologies at the intersection of colonial biopower

and sovereignty, indigeneity, and Indigenous peoples even as such analyses are necessary for formulating critical frameworks that understand how biotechnologies constitute while being constituted by the racialized/ing-gendered/ing bodies that see and govern who they see. The movement of biotechnological eyes across political boundaries signals the ongoing need for more-than-state based analyses of relations of coloniality, which do not eclipse the role of nation-states among colonial formations, but which are not limited to them. As the transnational development of forensic DNA science shows, critical Indigenous theorizing must grapple with biotechnologies that extend colonial relations of violence through the re/iterations of indigeneity.

Fielding Relations of Violence #3: Patriarchal White Sovereignty and the Data-Basing of Female-Indigeneity

Analyzing the impact that modern logics have had on conceptions of the Indigenous body, Hokowhitu (2009) argues that mind/body dualism characteristic of modern thought is "at the heart of savage constructions of Indigenous peoples" (p. 101). Within the colonial frame, he explains, some people (certain European men) were deemed to be rational such that they could overcome their bodily desires and capacities. Their reason enabled them to establish and operate civil and sovereign societies. Alternatively, the logic of mind/body dualism has tended to produce Indigenous peoples as being "inherently more 'physical'" (Hokowhitu, 2009, p.108), and insufficiently reasoned to possess territory and govern their politics. Hokowhitu explains that through the racialization of Indigenous bodies, that is, through their reduction to physicality, their dispossession has been teleologically linked.

While Hokowhitu's explanation is helpful for thinking through the implications of Enlightenment rationalism and how it has shaped structures of Anglo-developed nation-states, he awkwardly offers a masculinist universalization of Indigenous embodiment. While elsewhere

(for instance, Hokowhitu, 2004) he explicitly explores Maori masculinity, he does not consider how racialized productions of indigeneity and linked practices of Indigenous dispossession are relationally produced with gendered/ing logics and practices of governance, including his own gendered embodiment (which, as they do for everyone, impacts his creation of knowledge). Conversely, Indigenous feminist approaches have developed theories explaining how racialized/ing *and* gendered/ing violence is not merely symptomatic, but constitutive of colonial experiences (Barker, 2017; Arvin, Tuck, and Morrill, 2013; Huhndorf and Suzack, 2010; Green, 2007; Napoleon, 2001).

My critique of the racialized/ing-gendered/ing colonial power relations that structure the MPP builds upon and develops Indigenous feminist theorizing. There is much scholarship (discussed below) operationalizing Indigenous feminist or as Arvin, Tuck, and Morrill (2013) call them, native feminist theories and also, queer Indigenous frameworks that have identified and analyzed colonialism as a racialized/ing-gendered/ing formation constitutive of white heteropatriachy. These theories have examined how, within colonial regimes of power, the roles, bodies, and lives of Indigenous women, girls, and LGBTQ2S individuals are destabilized and debased (Barker, 2017; Kermoal and Altamirano-Jiménez, 2016; Altamirano-Jiménez, 2013; Goeman, 2013; Driskill, Finley, Gilley, and Morgensen, 2011; Palmater 2011; MacDougall, 2006; Anderson, 2000; Thomas and Jacobs, 1999; Trask, 1999). Amidst the academic literature there is a lacuna on the creation of DNA-based responses to violence against Indigenous bodies as also being shaped through relations of coloniality (for literature regarding violence against indigenous women and girls in Canada see, Hunt, 2015/2016; Holmes, Hunt, and Piedalue,

2014).[18] I expand on Indigenous feminist theories by considering also how federal rhetoric about addressing violence against MMIWG is contributing to the biotechnological advancement of the Canadian forensic DNA sector and patriarchal white sovereignty to which it is related.

Within regimes of patriarchal-white sovereignty, female-indigeneity has been produced as an object of white entitlement just as the earth has (Jaimes Guerrero, 2009; Razack, 2000); as routinely penetrable, permeable, willing (Anderson, 2001; Razack, 2000) and I would add, supposedly deserving; as prostitute, dirty, and promiscuous (Stote, 2015; Hall, 2009; Razack, 2000); and these characteristics are said to circulate according to a "Pocahontas perplex," whereby Indigenous women and girls are perceived as being better off in the redeeming control of white men (Finley, 2011; Green, 1975). Furthermore, Indigenous feminist theorizing has shown how Indigenous women's historic roles in governance have been altogether undermined (Green, 2017; Palmater, 2011; MacDougall, 2006; Napoleon, 2001). These racialized/ing-gendered/ing re/iterations circulate even as Indigenous women, girls, LGBTQ2S individuals struggle boldly to assert the terms of their own sovereignties, sexualities, kinships, and ways of relating.

The Indigenous female body has been re/iterated through what Moreton-Robinson (2004) refers to as the possessive logic. As the logic of possessiveness goes, to name another is to understand them as being *your* object to name. It is the logic that altogether enables the theft of Indigenous territories and the enchanted self-proclamation of nation-state sovereignty; the racially-gendered motivated valuation of white bodies over Indigenous (and other) ones; and the

[18] DNA-based technoscientific responses to violence have not gone completely unnoticed by Indigenous academics. Kwakwaka'wakw scholar Sarah Hunt (2014), for example, has discussed the Missing Persons DNA Program and MMIWG in the Canadian media. It is a topic, however and until now, that has not been examined academically.

perverted violations involved with interpersonal forms of racialized/zing-gendered/ing violence.

In Canada, a powerful way in which patriarchal-white possessiveness has defined and regulated Indigenous women's bodies is through *Indian Act* definitions of the Indian (Palmater, 2011; Eberts, 2010; Grammond, 2009; Barker, 2006; Fiske, 2006; McIvor, 2004; Green, 2001; Napoleon, 2001). As such, the registration of Indigenous peoples on a government database is not new. Since 1951, the *Indian Act* has included the Indian Register, which systematized to an unprecedented level the pre-existing identification and governance of (some) Indigenous bodies as Indians. The Indian Register helped to inaugurate in Canada a biopolitical system of accounting – an accounting of bodies – where Indigenous peoples were enumerated as "status" and "non-status" to identify and juridically manage their relationships to relatives, territories, and to the Canadian nation-state. As such, the Indian Register has re/iterated indigeneity as the "Indian population" according to racialized/ing-gendered/ing relationships amenable to administrative management and federal governance. As you will see, the biopolitics at play are precursory to the biotechnological control of the MPP.

Operating according to logics of race expressed through the symbol of "Indian blood," as well as sex, marital status, and heteronormativity, the *Indian Act* has historically treated the Indianness of legally defined women as being juridically more flexible than that of Indian men. Until 1985, for instance, an Indian woman who married a non-Indian man would lose her Indian status and, with it, the right to take up residence on reserve and inherit family-held property. Her children suffered the same consequences and even divorce from, or the death of her husband did not guarantee a woman's return to her community (Jamieson, 1978). Within the Canadian juridical field, *Indian Act* registration rules have produced an ontology of female-indigeneity as lacking substantive personhood and, correspondingly, the transformative potential dependent on

its relationship to maleness. As such, the *Indian Act* re/iteration of female-indigeneity has been relationally generated in opposition to (patriarchal-white) personhood in Canada.

The legal enfranchisement of Indigenous peoples has tended to be accompanied by socio-economic exploitation and marginalization and is linked to physical and sexual violence against Indigenous women and girls (Kuokkanen, 2008; Lawrence and Anderson, 2005; Young and Nadeau, 2005). Christine Welsh's (2006) powerful documentary *Finding Dawn* pertinently demonstrates how, for many Indigenous women, enfranchisement off of the Indian Register, and consequently, not being able to live in their home communities was a cause of also the physical violence they experienced (discussed further in the next section). While federal legislative attempts have been made to limit the gender discrimination in *Indian Act* registration, namely Bill C-31, Bill C-3, and Bill S-3, gendered discrimination has not been completely eliminated, nor has the combined racialized/ing-gendered/ing governance of Indians through the *Indian Act* ended.[19] *Indian Act* registration leaves an ontological trace about female-indigeneity in terms of biology that can be governed, but lacks the sovereignty required to govern itself.

The Indian Register and the Missing Persons DNA Program are connected, specifically since they both reflect government efforts to database the personal information of individuals (including now genetic data) under the umbrella of Canadian sovereignty. To date, there has not been a nation-to-nation relationship between Indigenous peoples and Canada in the governance of the MPP. This is a missed opportunity that, if taken, could improve existing efforts directed at identifying MMIWG and convicting their offenders. The design, operation, and control of the MPP requires ongoing consent and collaboration with Indigenous peoples if it is to avoid

[19] For a review of *Indian Act* gender and sex discrimination and the legislative amendments addressing it, see Kolopenuk (2014), Palmater (2011), and Eberts (2010).

becoming a form of contemporary paternalism that has historically laced colonial policy-making.

The Indian Register and the MPP are linked because the *Indian Act* itself has helped to create relations of violence by 1) ontologizing female-indigeneity as a visible and thus governable biological body and 2) dispossessing (many) Indigenous women through inclusion or exclusion from it. For example, due to the privacy policies in place at the National DNA Data Bank, sex - coded as either male or female - is the only personal identifying marker visible to technicians who work with the samples and which is visible in the database (RCMP, 2007). As such, definitions of genetically-defined sex will, I predict, contribute to producing the specific contours of knowledge about missing persons in Canada according to a gendered impulse in a similar way that legally defined sex and heterosexual pairing have contributed to the construction of female-indigeneity (via Indianness) through the *Indian Act*. It is only when female-indigeneity is ontologized as being primarily biological and in denigrating ways (not a reasoned and self-governing body) can the identification of fragments of her body become the register for closure in her death.

Living Relations of Female-Indigeneity

I decided to write the final version of this chapter during the month of February. It is the month that holds a nation-wide day of remembrance, love, and action on February fourteenth, for Indigenous relatives who have been lost. In 2018, it also became the month that Raymond Cormier was acquitted of second-degree murder in the death of fifteen-year old, Tina Fontaine (from Sagkeen First Nation) in Winnipeg, MB. This chapter was a difficult one to write. Unlike for those non-Indigenous people who write about indigeneity, Indigenous scholars write about ourselves, our families, and our homes. While I write this chapter, I am placed in that difficult location where personal pain and resilience meet academic process. Beloved Tina's story is not

one for me to comment on. She has relatives who are placed to tell it if they so choose. Aspects of her story are, however, familiar to me and they bear many resemblances to the life that my mom has lived. The weight of their shared experiences buckles against my interest in the Missing Persons DNA Program and so too do they vividly expose the sets of relations that inj/(g)/end/-ure(er) female-indigeneity. With my mother's permission, I share some of my mom, grandma's, and my own relations of living female-indigeneity.

My mom, a Cree and Dutch-descendant woman from Peguis First Nation had a challenging childhood. It began when her dad was killed in a hunting accident when she was 6 years old. His side of the family, the Dutch side, soon after moved to British Columbia leaving my late grandmother, widowed with two small children. The grief of her husband's death would settle deeply into my grandma's heart and its pain would be layered onto previously settled strata of faded scars.

The oldest girl of nine kids, my grandma grew up on the Peguis Indian Reserve about an hour and half north of Winnipeg. She went to Indian day school, then residential school, and finally moved to the city where she worked as a domestic labourer for rich families. When she was a young woman, she fell in love with a non-Indian man. They got married, and, as a result, she was denied access to housing and family–held land on reserve due to that marriage. These were the *Indian Act* rules of the time and so, upon the death of her husband, my grandma had to remain in the city with my mom and uncle in tow. Without a lot of options as a single native mother in 1960s Winnipeg, she ultimately turned to the numbing that a relationship with alcohol could provide, and my mom, after the age of 6, was often left unsupervised. She ended up enduring years of sexual abuse inside her own home at the hands my grandma's new common law husband. The abuse would last for seven years until my mom, out of terror and bravery, fled

to a friend's house following an especially horror-filled night. Winnipeg Child and Family Services (CFS) apprehended her. Despite years of terrorizing, her abuser would face charges on one count of contributing to the delinquency of a minor. He got a two hundred dollar fine with the court deciding that ultimately, my mom, a young child at the time, was at fault for being sexually provocative in her nighty: Canadian justice was served. CFS subsequently denied my mom placement among her First Nations family on reserve, and so she remained in provincial care and bounced between foster homes where she would endure more sexual abuse from white men.

Interpersonally, in Manitoba's child welfare institution, and in the Canadian legal system my mom was treated as if she were a body to be violated, moved around, and blamed. But despite the odds and unlike Tina who walked many of the same steps along Winnipeg's downtown streets, she beat the odds of what too often comes with being an Indigenous girl: she lives.

Molecular Sight and Embodied Invisibility: Female-Indigeneity, the Missing Persons DNA Program, and Star Women

Through their disappearance, DNA profiling brings "MMIWG" into molecular visibility: a new form of existence in which high-tech freezers will theoretically thaw cases that have long been deemed cold. The hyper-representation of Indigenous women, girls, and two-spirit persons may translate into their being hyper-visible in the database. After all, "in a laboratory, no naked access to truth is thinkable. Is a microbe visible without the mediation of a microscope?" (Latour, 2004, p. 459). Through a lens of patriarchal-white sovereignty and its possessive logic, MMIWG2S are being looked at as female-indigeneity - their identification molecularly re/iterated.

While previous practices of naming and un-naming Indigenous women, like through the *Indian Act* continue to impact the material realities of Indigenous women and their families and which help to create conditions of physical violence, now there is also a biotechnological process that will put their biological material into the literal possession of the nation-state: a nation-state that has principally created the colonial conditions for their disappearance in the first place. Given such a convoluted politics sketched out in this chapter, we may well ask whether the National DNA Data Bank will become a racialized/ing-gendered/ing bio-archive of sorts that correlates female-indigeneity with victimhood? Will the MPP contribute to re/iterating Indigenous peoples as inevitably fading from existence by entangling disappearance and death with genomically seen race and sex? And if so, will a consequence of the MPP be the further condition Indigenous dis/possession as natural?

Given the history out of which it has emerged, the MPP can be understood through relations of dispossession that labour in the service of managing the population through the "problem" of MMIWG. This occurs by folding Indigenous female DNA into the body-machine complexes of nation-state-sponsored forensic science and, further, state ownership and control of the means (ie. the biotechnologies) through which that possession and re/iteration of indigenous female materiality occurs. At no governance level are Indigenous peoples in control or operation of the MPP. Yet, the bodies of Indigenous people, in the form of biological samples, will be used in the growth of constabulary institutionalism in Canada, and between it and transnational collaborators especially insofar as the MPP builds upon the pre-existing National DNA Data Bank. In its use as a biotechnology among the DNA-based forensic era, the bodies of MMIWG2S are being analyzed in ways that are extending the ongoing bio-modernization of governance in Canada and across the globe.

To be clear, I do not wish to deny the benefit that families may seek in painfully receiving confirmation of their loved ones' whereabouts even possibly in death, and I also do not wish to deny the helpfulness of forensic science in some cases where positive identification leads to the resolution of a missing person or homicide case. However, I maintain that the question of DNA-based responses to violence remains important not least of all because of the totalizing and uneven regimes of biotechnological control exerted in violent ways against virtually every cosmic being that is made to be seen through the eyes of body-machine complexes *rather than made to be kin*. For even as those women, girls, and two-spirit individuals that get described as missing and murdered slip back into the star world, they *still* cannot evade the gaze of the body-machine – they are still, even in death, object to the biotechnological eye that surveilles, defines, and maps them. The telescope, the light beam, and the lens continue to reorder the existence of our relatives, the star women, through the cosmic imagining that they coerce into astronomical truth. This biotechnological gaze cannot see them as relatives as such for its eyes are blind to a kinship ontology. It sees them only rationally, as gravitationally formed bodies of matter.

The women are gone. They have been made to be gone because of the colonial contouring of their earthly existence, but they are also still here. They live among us revealed by the night sky. What also endure are re/iterations of Indigenous bodies as valueless and as able to be produced as possessable through the patriarchal-white stare: a starkly different eye than the one of our watchful grand/mothers. Biotechnologies like those involved in the MPP propose a partial solution to addressing violence against Indigenous women and girls by calling for the post-mortem identification of missing persons, but such biotechnologies stand out brightly

against a background of societal reluctance to make the systemic changes necessary to bring about the end of violence that continues to be characteristic of Canada.[20]

[20] Alondra Nelson reminds us that "the issues, controversies, and questions we pose to science about race and the unsettled past can never find resolution in the science itself" (2012, p. 28); and further, in the words of Kwakwakwak scholar, Sarah Hunt, "Surely tracking Indigenous girls' DNA so they can be identified after they die is not the starting point for justice. Indigenous women want to matter before we go missing. We want our lives to matter as much as our deaths" (2014).

Chapter Afterward

What follows is a policy idea informed by the above research that outlines practical first steps to begin adjusting the relations of coloniality of the NDDB's governance. This policy proposal was submitted to the Canadian Science Policy Center (CSPC) in 2018, and awarded the Canadian Science Policy Award of Excellence (Youth Category) by the Minister of Science and Sport, Kirsty Duncan. I include this material as an Afterward to demonstrate the power of *being a star woman* and the transformative potential of Indigenous knowledge in science and science policy.

Policy Proposal Title

An Indigenous Approach to Canada's National Missing Persons DNA Program

Inspiration

The legacy of gender-based violence moves through my family, as it does for other Indigenous families who have endured historical and interpersonal traumas associated with colonialism. Less well known to the outside world, though, are the legacies of strength, resilience, and love that are also passed through our generations. The love that I have been given and that which I have for my mom and grandmother, my women relatives, and all those who have experienced physical and sexual violence inspires me to write this proposal. By imagining a productive solution that contributes to ending systems of violence, this proposal is a sign of endurance marking our collective refusal to be altogether defined by victimization.

Need & Opportunity for Action

In Canada there are 1,181 confirmed cases of missing and murdered Indigenous women [RCMP 2014]. Compared to other Canadians, Indigenous women are more likely to experience violence in their lifetime; they are more likely to die as a result of this violence; and their homicides are

more likely to go unresolved [RCMP 2014]. International, federal, provincial, and Indigenous research conclude that the victimization of Indigenous women, girls, and 2SLGBTQ (Two Spirit, lesbian, gay, bisexual, transgender, and queer) is systemically linked to Canada's history of race and gender-based policies of discrimination against Indigenous peoples [Amnesty International 2004, 2009; Government of Canada 2014; Oppal 2012; Assembly of First Nations 2012; Native Women's Association of Canada 2009]. Academic research has shown that especially the legal disenfranchisement of Indigenous women and their descendants from their communities via sexist *Indian Act* registration rules, accompanied by socio-economic marginalization is linked to physical and sexual violence against them [Barker 2016; Hunt 2015/2016; Altamirano-Jiménez 2013; Goeman 2013; Kuokkanen 2008; Lawrence and Anderson 2005; Young and Nadeau 2005]. For many Canadians, these are sad realities. For Indigenous peoples, these realities mark the devastating loss of our loved ones who may never come home.

Globally, the analysis and data-banking of DNA is being built into modern systems of governance. As Dr. Frederick Bieber, Advisory Committee member of Canada's National DNA Data Bank writes, "[m]ost industrialized nations now collect biological samples from crime scenes and from those convicted of serious crimes for entry into government DNA data banks" [2006, 223]. Additionally, forensic DNA profiling is used by governments for purposes of "missing persons recovery efforts, and for reunification of human remains in the aftermath of mass disaster or war" [Bieber 2006, 223]. Internationally, large-scale DNA-based identification projects have been designed to, for instance, find the 8960 missing persons killed during the military dictatorship in Argentina from 1976 to 1983 [Corach, *et al*. 1997]. Likewise, following conflict during the break-up of the former Yugoslavia, the *International Commission on Missing Persons (ICMP)* was established in 1996 to identify the over 30,000 persons who had gone

missing. These projects have set a global precedent: massive coordinated efforts to forensically identify missing and murdered individuals *are* possible. An Indigenous approach to identifying MMIWG is also possible.

In 2015 the federal government announced the launch of the *National Inquiry into Missing and Murdered Indigenous Women and Girls*. One year earlier on December 16th, 2014, *Canada's National Missing Persons DNA Program* (MPP) was legalized after Bill C-43, *The Economic Action Plan 2014 Act*, No. 2., was passed by Parliament. Adding three new humanitarian indices to the pre-existing National DNA Data Bank, the MPP is part of a federal government effort to standardize DNA profiling and coordinate the organization of DNA-based data for all missing persons in Canada. Additionally, Canadian policy actors have framed the MPP as both a preemptive and after-the-fact response to violence against Indigenous women and girls [Government of Canada 2014*;* Rabson 2014; Oppal 2012, 129]. To date, however, there has not been a government-to-government relationship between Indigenous peoples and Canada in the governance of the MPP. Further, the *National Inquiry* has not targeted forensic DNA policy as an area of research. These are missed opportunities that, if taken, could improve existing policy efforts directed at identifying MMIWG and convicting their offenders.

The fields of science, politics, and law continue to be defined by power imbalances in which Indigenous peoples are not in governing control of policy areas that affect them [Truth and Reconciliation Commission 2015; Royal Commission on Aboriginal Peoples 1996]. Having not designed the MPP, Indigenous organizations have been cautious about its effectiveness. In 2014, the Assembly of First Nations (AFN) warned that it is distrustful of the government's motivation for collecting and preserving Indigenous people's DNA [Blaze Carlson 2014]. As a question of national policy, the design, operation, and control of the MPP requires ongoing

consultation, consent, and collaboration with Indigenous peoples if it is to avoid becoming a form of contemporary paternalism that has historically laced colonial policy-making.

Proposed Action

Policy solutions aimed at identifying MMIWG and convicting their offenders need to be determined *with*, *by*, and *for* Indigenous peoples, nations, organizations, and families. This proposal, therefore, stops short of offering a prescriptive answer. Instead, it advances a pathway toward the *co-production* of policy through the cooperation of multiple stakeholders. This approach to policy creation can strengthen the effectiveness of a culturally safe MPP for Indigenous peoples while also strengthening relationships between the federal government and Indigenous peoples. There are some clear initial steps that can be taken to commence this process.

1. Meaningful Indigenous Representation on the National DNA Data Bank Advisory Committee.

The National DNA Data Bank Advisory Committee, appointed by the Solicitor General of Canada, oversees the effectiveness and efficiency of the Data Bank. The Committee is composed of experts in legal, scientific, constabulary, and bioethical fields. There is currently no Indigenous representation on the NDDB Advisory Committee. Given that, in part, the rationale for the creation of the MPP has included consideration of MMIWG, the NDDB Advisory Committee should have Indigenous representation. The percentage of members that are Indigenous included on the Committee ought to be decided in consultation and consent with relevant Indigenous women's organizations including the Native Women's Association of Canada, Pauktuutit Inuit Women of Canada, and Les Femmes Michif Otipemisiwak / Women of the Métis Nation.

2. Developing Culturally Relevant DNA Handling Protocols

There are culturally distinct ways of understanding DNA [Claw *et al*. 2018; Sahota 2014]. As late Hopi geneticist Dr. Frank Dukepoo has expressed: for many Indigenous cultures, DNA holds physical and also spiritual significance - genetic material, even when separated from the body, remains part of the whole person [Petit 1998; Arbour and Cook 2006]. To adapt to advances in DNA-based governance, Indigenous peoples around the world have been developing culturally consistent policies related to the use of DNA. In Aotearoa/ New Zealand, for example, the *Guidelines for the Disposal and Retention of Samples and Specimens* have been developed: culturally safe Maori protocols for the handling and destruction of DNA [Cunningham, et al. 2007]. In collaboration with grassroots, provincial/territorial, and national Indigenous organizations, the NDDB should develop optional protocols for Indigenous families who consent to the inclusion of their or their loved one's DNA into the MPP. This policy change would make Canada a global leader in a reconciliatory approach to forensic DNA policy.

3. Coordinating Research and Practice Among the National Inquiry and the MPP

The National Inquiry into Missing and Murdered Indigenous Women and Girls has been extended to April 2019 at which time it must deliver its final report. Currently, the *National Inquiry* has not publicly identified the governance of the MPP and the collection, profiling, and data-banking of Indigenous women, girls, 2SLGBTQ and their family members' DNA as a research priority. As government sponsored forensic policies and practices increasingly move toward the collection and profiling of DNA, Indigenous peoples should not be left behind. In consultation with the NDDB and the National Centre for Missing Person's and Unidentified Remains (NCMPUR) as well as in its ongoing consultation with institutions, experts, and communities, the *National Inquiry* should include consideration of forensic DNA approaches to the identification of MMIWG. The *Inquiry* might consider how current forensic policy can be

used or improved to convict offenders.

Chapter 3

PostIndigeneity and Links-Without-Chains: Hyper-Racialization-Gendering and the Wetware of Whiteness

DNA-based understandings of human ancestry are affecting how identities of difference are formed and organized (Subramaniam, 2014). This aspect of what is commonly referred to as "the genomic revolution" (Reardon, 2005, p. 4) is contributing to the formation of what some describe as a *posthuman* condition, in which modern markers of "the human" are being increasingly colonized by "the code" (Kroker, 2014, p. 5). Among this set of post- relations, genomic knowledge prioritizes "the gene" as "the basis of life" (Fox Keller, 1995, p. 9; see also Haraway, 2016). Emerging biotechnologies, like ones that involve the knowledge and manipulation of DNA, as Haraway explains, are among "the crucial tools recrafting our bodies" (Haraway, 2016, p. 33). As the ways that people think about our bodies and their relationships to identities of difference shift, Reardon (2017), riffing off of Arendt (1958), further imagines and articulates posthumanism in terms of "a postgenomic condition" in which "the question of the uses, significance, and value of the human genome sequence" (p. 2) has become the terrain for pursuing political projects of democracy and justice.

As genomic knowledge expands and biotechnologies proliferate among consumer culture, it may appear that DNA-based research, technologies, and economies are popping up suddenly. However, to understand genomics and its relationship with posthumanism or the postgenomic condition as being revolutionary is, as E.W.R. Steacie said of the Industrial Revolution, unfortunate insofar as "it implies a sharp, definite stage in development" (Babbitt, 1965, p. 106). The manners through which knowledge of DNA continue to impact the re/iterations of life, variation, and identity/difference have not been inevitable, but neither have

they been sudden. Attempts to capture these processes as being abruptly transformational conceals the various struggles, historical contingencies, and relations of power that have been and continue to be productive of advanced DNA-based identity/difference categories and the scientific fields, technologies, and economies that give them shape.

Posthuman and postgenomic idioms can be helpful in making sense of the relations through which genome sciences are re/iterating indigeneity. Posthuman and postgenomic conditions are, as explained by Wendy Brown (2010) in her discussion of the prefix post-, indicative of "a very particular condition of afterness in which what is past is not left behind, but, on the contrary relentlessly conditions, even dominates a present that nevertheless also breaks in some way with this past" (p. 21). That is, while genome sciences have temporally moved into a period that is *after*, for example, race science (i.e. studies which made indigeneity into an object of scientific inquiry in the first place), it has not completely gotten *over* its predecessory influences. Nevertheless, genomic knowledge re/iterates meanings of indigeneity by forging a novel system of representation that understands posthuman and postgenomic existence according to the assemblages of genetic building blocks: adenine, guanine, cytosine, and thymine.

To conflate older versions of race science with genomic research would be to attribute universality and timelessness to genetic concepts of life and identity/difference (TallBear, 2013, p. 53). Likewise, to analyze genomic re/iterations of indigeneity outside of the contexts of race science would lead to an incomplete understanding of the relations through which indigeneity is being re/iterated through and against the materiality of Indigenous bodies. In this chapter, I explore refreshed relations of indigeneity in the form of postindigeneity. Postindigeneity, as I see it, is an exceedingly hyper-racialized/ing-gendered/ing iteration of indigeneity produced through relations of neoliberal and biological technologies of self-identification: the stuff of whiteness'

"psychology, subjectivity, and affect" (Kroker, 2014, p. 13). This chapter charts a set of theoretical connections that might be used to interpret a phenomenon in Canada involving increasing numbers of individuals and organizations that are emerging as Indigenous in Eastern Canada, by using narratives of, for example, sixteenth century ancestral (Indigenous and European) mixing, (allegedly) evidenced by DNA testing to embolden claims for federal recognition. My interest is not in interrogating these claims and the individuals and organizations that make them as does the work of others (Leroux, 2019). Instead, my analytical objective is to interrogate the relations of coloniality generative of the field of study (biological anthropology) that has made the use of biotechnologies and economies of DNA, ancestry, and identity by would be Indigenous people.

To elaborate, this chapter focuses on the shift from the late-nineteenth century scientific knowledge that saw Indian blood as a substance of racialized/ing-gendered/ing inheritance and as an object of scientific curiosity to the early and mid-twentieth century when ideas about continental difference were re/iterated as population-based studies of Native American DNA. This shift will be explored in the first part of the chapter, where I argue that there has been a move among scientific logics from the racialization-gendering of Indianness expressed through blood (as one iteration of indigeneity) to the hyper-racialization-gendering of Native Americanness expressed through DNA (as an/other). I will position the stakes of such a shift in its contribution to conditioning the possibility of white propertied (Harris, 1995) claims to postindigeneity. I argue that the way that this phenomenon is materializing in Canada, DNA-based productions of Indigenous ancestry merge with a scientific legacy of presumed racialized/ing-gendered/ing mixedness expressed as hybridity (particularly, but not only as it shapes narratives of about Métis identity/difference) in a way that nurtures a will-to-be-

Indigenous no matter the political, historical, and even biological odds. This theoretical work fits into the larger project of examining how changes in technoscience correlate with changes in the relations that colonial nation-states and their citizenries, but also bioeconomies and their consumers use to form themselves, in this case, *as* Indigenous peoples.

Anthropology's Old and New Physicalities

In the late nineteenth and early twentieth centuries when race and gender-based categories in colonial law and policy (such as, census data and the *Indian Act*) were solidifying administrative governance in Canada, scientific fields were asking questions about what constituted those races.[21] Colonial governance - in the political form of sovereignty and nation-statehood - did not simply inherit the classification schemes of race from European (natural) history and then North American physical anthropology; rather, the knowledge of racialized/ing-gendered/ing difference was generated in relationship to global scientific knowledge fields and the conversations and institutional connections linking them.[22] As Lindee and Ventura Santos (2012) explain, the sixteenth to twenty-first centuries have been characterized by the movement of goods, people, and ideas around the globe at an unprecedented scale. They maintain that during these centuries, "[p]hysical anthropology participated in this process, partly by bringing

[21] For a history of the juridical categorization of Indians in Canada see Palmater (2011) and Eberts (2010). Others have also explored the history of state-based categorizations of Indigenous peoples in Canada like Lawrence (2004), Andersen (2014), and Backhouse (1999)

[22] For example, Horsman (1981) writes, "The American intellectual community did not merely absorb European ideas, it also fed European racial appetites with scientific theories stemming from the supposed knowledge and observation of blacks and Indians. In this era the popular periodicals, the press, and many American politicians eagerly sought scientific proof for racial distinctions and for the prevailing American and world order; the intellectual community provided the evidence they needed" (p. 3).

back to scientific centers materials and bodily objects, collections of bones, bloods, remains, and measurements" (p. S6). In Canada, for example, late 19th century archaeology was preoccupied, like much of the race sciences at the time, with determining the origin of "the red Indian" (Wilson, 1869, p. 269), just as the *Indian Act* was consolidating a race and gender-based definition of the Indian.

By the early 1900s, physical difference became increasingly quantified in Canada as physical anthropology itself grew as a field. Franz Boaz famously pioneered physical anthropology research by studying the "body size of Native Americans, child growth, developmental plasticity, and population statistics" (Little, 2012, p. S126). Beyond the curious will to locate the genesis of the Indian race, scientists were also interested in answering questions about racialized/ing-gendered/ing mixing. Reginald Ruggles Gates, a dominant figure of British race science who happened also to be Canadian (Lux, 2001, p. 7) published in 1928 "A Pedigree Study of Amerindian Crosses in Canada" in *The Journal of the Royal Anthropological Institute of Great Britain and Ireland*. Gates was interested in the effects of white and Indian miscegenation, and especially, whether Indians admixed with white blood became more elevated on the scale of civilization and, oppositely, if the admixture of Indian blood degenerated white people to a more primitive stage. Hybrids, he found, were of superior stock than each pure parent. During this same time (as established in Chapter 2), juridical convention saw that Indian women who married non-Indian men became white according to law, while Indian men who married non-Indian women, remained Indian. If the juridical logic at the time reflected a broader racialized/ing-gendered/ing logic, then it would be fair to read Gates' study as being racially, and equally, gendered in its finding.

Twentieth century studies that relied on phenotypic observation and categorization as well as hypotheses of blood-based inheritance can be described as fitting into what now gets referred to as the "old anthropology." Little (2012) describes this old anthropology as "a largely descriptive science with interest in typological treatment and classification of race studies" (p. S130), and Lindee and Ventura Santos (2012) describe it as "typological and essentialist" (S4). Twentieth century studies that relied on phenotypic observation and categorization as well as hypotheses of blood-based racialized/ing-gendered/ing inheritance were animated by, in Deleuzian language, an arboresque logic. This logic presumes the body/mind binary in which cognitive capacity gets attributed to some parts (i.e. the immaterial mind located in the brain) of the body and productive capacity to others (i.e. the rest of the material body). The resulting framework understands the body as being separate from the mind and made up of distinguishable, autonomous parts subjectable to signification (Brown, 2010, p. 7; Deleuze and Guattari, 1987, p. 167).

In the 1930's leading to, especially, the fall out of World War II when race science was becoming ethically and politically untenable, physical anthropologists and geneticists joined a broader scientific movement to redefine the study of human difference as being population (rather than race)-based (TallBear, 2013, p.38; Reardon, 2005, pp. 79, 40). This movement "to a hypothesis-driven science with a theoretical grounding in human evolution" (Little, 2012, p. S130) marks the scientific modernization of human population biology (p. S126). The "new physical anthropology" was born (Washburn, 1951); and has since been further modernized as biological anthropology. The endeavor was called a populational genetical science of human diversity (Stepan, 1982, pp. 172-173), whereby the study of "genetics was being transformed

from an analytical mode of ‘phenotypic inference’ to a more sophisticated mode of ‘direct DNA’ or ‘molecular genetics’ analysis” (Little, 2012, p. S126).

In order to draw a genomic world picture, the DNA of Indigenous peoples (both living and ancestral, human and not) has been sought for the apparent knowledge that it can reveal about ancient migrations and evolutionary histories (TallBear, 2013, p. 39; Reardon, 2005, p.1). Furthermore, technological and scientific capacities are shaping new directions in biological anthropology where the desire to sequence the DNA of contemporary Indigenous peoples has been joined with capabilities to sequence that of their ancestors as well. Advances such as the development of high-throughput sequencing platforms and aDNA enrichment strategies (Orlando, Gilbert, & Willerslev, 2015) are enabling scientists (i.e. paleogenomicists, molecular/genetic anthropologists, population geneticists, and bioarcheaologists) to study the DNA of ancient peoples and other biological organisms: the ancestors and relatives of Indigenous peoples. Among this field, there is a growing perception that technological capacities to study aDNA are outpacing the commensurate advancement of ethical frameworks germane to this same science. Indeed, over the last 30 years there have been numerous cases of conflict in genomic research between researchers and Indigenous peoples (see Claw et al., 2017; Garrison, 2012; Barker, 2002; Wiwchar, 2000). While these tensions, and the apparent lack of ethical oversight that they reveal seemingly pit scientists and Indigenous peoples as equal and opposite stakeholders in research, they are not.

Indigenous peoples of the Americas are of particular scientific interest among biological anthropology and bio-archaeology because it is believed that their relatively recent migration to the Americas makes their genomic diversity patterns helpful in explaining global movements (Hoffecker, et al., 2016). Research with samples obtained from Indigenous peoples have led to

significant findings regarding such topics as "population genetic structure, demographic histories, and even health and disease" (Bolnick, Raff, Springs, Reynolds, & Miró-Herrans, 2016, p. 320). It is clear that Indigenous people's DNA (ancient or otherwise) has potential to extend knowledge of human histories (the collective "we"). However, tension between the sovereign right of Indigenous peoples to be self-determining and the scientific storying of "Native American DNA" is real and well established in the academic record (Kolopenuk, 2018; Bardill, 2017; TallBear, 2013; Berthier-Foglar, Collingwood-Whittick, and Tolazzi, 2012; Garrison, 2012; Harry, 2005; LaDuke, 2005; Barker, 2002).

In part constitutive of the new physical anthropology, "Native American DNA" has become a label used to describe the genetic mutations allegedly inherited by (some) contemporary Indigenous peoples from the so-called founders of Native American populations (TallBear, 2013, p. 42).[23] Native American DNA joins other continental level categories including sub-Saharan African, European, and East Asian DNA derived by isolating genetic mutations in mitochondrial, y-chromosome, and nuclear DNA. Certainly, however, as TallBear (2013) writes, "Native American DNA could not have emerged as an object of scientific research . . . until individuals and groups emerged as 'Native American' in the course of colonial history" (p. 5). Far from being an objective descriptor of a so-called biological constitution, "Native American DNA" has become one among many re/iterations of indigeneity.

Because Native American DNA has come out of histories of race science and colonial relations, Kim TallBear (2013), whose work I draw on heavily, has carefully laid out the shift in which scientists were interested in racial origins and differences and relied on the symbol of

[23] A founder population is a group characterized by a genetic mutation that appears in the DNA of one or more founders in the group and those descendants that have inherited it.

blood to denote the unit of inheritance among essential characteristics to the newer study of populations and evolutionary changes through the material-semiotic of DNA. She maintains that differentiation is important as she responds to academic conflations that abstract gene talk from its historical coming of age, simply swapping it for blood talk (see for instance, Doerfler, 2015; Garroutte, 2003, p. 39; Peterson and Brown, 1985, p. 5). Others (see for instance Bardill, 2010) have made a similar argument, suggesting that genomic research is a more material project compared to race science since Indian blood, the object of heredity in race science, can be perceived as both physical and metaphorical, but that DNA is, conversely, a literal materiality.

While I am in full agreement (and have myself been trained through it) that a genealogical account of blood and genes as symbols of race is necessary in order not to attribute inevitable and universal meaning to genomic knowledge, I feel hesitant toward the second argument that is built into the first: that DNA and the study of it reflects a more material project than that of blood politics. The hazard I see with this logic is that it reinforces the metanarrative among biological anthropologists that what they do *is* altogether different than what race scientists did. The suggestion that the DNA of genomic knowledge is more material than the blood of race science implies that there is definite accuracy insofar as it is describing rather than re/iterating relations in terms of 'nature' and 'biology.' Instead, I suggest that the semiotic labour and materiality of blood and DNA and studies of them differ, not in form, but in scale. Population genetics research, for example, is a more refined understanding of blood as a unit of heredity, but its object of analysis is not more material. Framing it otherwise would reinforce the scientific field's symbolically powerful position within the broader epistemic field as revealing truth rather than being just as contingent as any other form of knowledge production.

The contingency of scientifically re/iterated Native Americanness has been previously analyzed in terms of the technical limitations of genetic tests, themselves. The methodological limitations of autosomal, mitochondrial DNA, and Y-chromosome tests have been documented, and the unreliability of direct-to-consumer (DTC) genetic testing is well known (TallBear, 2013; Bolnick, 2003; Eshleman, Malhi, and Smith, 2003). For example, mitochondrial and y-chromosome tests analyze only single genetic lineages meaning that when being sequenced for a mitochondrial DNA test, only one out of many hundreds of thousands of independent genetic lineages that are contained in one's genome is being tested. Additionally, it is also scientifically impossible to identify tribal affiliation genetically (Relethford and Bolnick, 2018). The production of scientific knowledge through experimental methods is incremental in character and subject to amendment, correction, or refinement. Just last year (2018), for example, researchers uncovered that mitochondrial DNA, once thought to be passed exclusively to offspring through the biological mother, can be, in some cases, passed by the biological father (Shiyu Luo et al., 2018). Scientific knowledge is contingent.

Instead of positioning the old to new anthropologies in terms of the materiality and symbolism of race, per se, I understand the shift in terms of a movement from the racialization-gendering of Indiannesss to what I am calling the hyper-racialization-gendering of Native American DNA. Blood politics relies on the erasure of the Indigenous person's immateriality while genomic study does not deny its existence, but rather deems it unnecessary for understanding the DNA of bodies. Scientists do not necessarily need to be concerned with the complexities of an Indigenous person's sense of self or an Indigenous peoples' emergence and common sense of being in relation to kin and to territory. The possibility for the scientist's practice of (only) studying genomic material gestures toward a valuation and assertion that the

two (the supposedly immaterial aspects of identity and the material makeup of a genome) exist separately and can, therefore, be studied in isolation. Put differently, the study of DNA does not mean that one is engaging in a critical study of the politics of difference even as they have been relationally formed. This detachment is what indicates an epistemological (and disciplinary) shift from a racialized/ing-gendered/ing logic that relied on the indivisibility of the Indigenous mind and body, to a hyper-racialized/ing-gendered/ing order that *insists* upon it.

The anti-racialist claim of the human genome (the collective "we") flattens out and works through the erasure of the politics of identity/difference that have led to the respective study of "Native American" and "European" DNA. This is not a shift toward a less colonial science. Rather, it is a shift that intensifies relations of re/iteration by claiming that genomic sciences are anti-racialist in their reliance on a mind/body detachment. It is through the assertion that genomic knowledge is making *no* claim about the identities/differences of Indigenous peoples in a more-than-genetic sense that allows the new anthropology to falsely distinguish its practice from the biologically deterministic way of thinking that was evident in nineteenth century race science.

Because of the force generated through the scientific field as a producer of legitimate knowledge, Native American DNA reverberate powerfully among broader social spheres, which have already been primed with older presumptions about racialized/ing-gendered/ing identity/difference. Subramaniam (2014) identifies such reverberations remarking that the supposedly benign scientific "*language of variation is thus converted into the profoundly political language of difference"* (p. 14, emphasis in original). Despite the scientific and political limitations of Native American DNA and other genetic ancestry markers, the private sector has capitalized on the public's curiosity and longing to discover their genetic roots. In the last

decade, conditioned by the research, databases, and methods of biological anthropologists, DTC genetic ancestry testing has become a "bioeconomy" (Birch, 2016), offering "Native American DNA" tests (among other ancestral "origin" tests) to interested consumers. Genetic ancestry testing companies advertise mitochondrial DNA and Y-chromosome tests as being able to tell customers if they are (genetically) Native American or not, while autosomal DNA testing is claimed to have the ability to provide consumers with knowledge of their possible percentage of (genetic) Native American ancestry.[24]

DTC genetic ancestry testing is shaped by colonial relations insofar as the bioeconomy within which is exists (and contributes to sustaining it) articulates the combined forces of capitalism, technoscience, and possessive claims to racialized/ing-gendered/ing indigeneity. Corporations, science labs, marketing experts, and driven consumers have conspired (consciously or not) to form a bioeconomy influenced by and through a voracity to *become* Indigenous. Consumers can send their bio-sample to a far-away lab that they might never see, to a scientist or lab technician who they might never meet, so that they can "uncover [their] ethnic mix, distant relatives, and even new ancestors" (Ancestry, 2018). The bioeconomy, as such, has increased access (for some) to biotechnologies of self-making.

Pop-up Indigeneity

[24] In Canada, DTC genetic testing is pre-existed by biomedical research practices that used the national postal service to transport bio-samples from the field and small labs to locales of expertise since at least the 1960s (Uchida and Ray, 1966). For DTC genetic ancestry tests, one must send a buccal sample to a company via postal or courier services. As a question of national policy, Canada has taken into consideration biomedical uses of DTC genetic testing, but not uses related to ancestry (see, for instance, Ries and Einsiedel, 2010). The Canadian Medical Association warns that DTC genetic testing is, for the most part, best suited for recreational purposes only (Canadian Medical Association, 2017). DTC genetic testing, however, remains unregulated in Canada.

Pretending to be an Indian is as old as the idea of Indianness itself (Deloria, 1998). In the United States, a prominent manifestation of performing indigeneity has been framed as "race shifting" (Sturm, 2002) by, for example, would-be Cherokee "Nations" (outside of the three federally recognized tribes), or as ethnic fraud by public figures like Ward Churchill, Andrea Smith, Rachel Dolezal, and Elizabeth Warren. In Canada, individuals and groups espousing ancestral European and Indian mixedness have made the same sorts of tenuous claims, especially in the past twenty years.[25] One such case is that of decorated author, Joseph Boyden who has identified himself as a genetic "mutt:" "Celtic DNA. Check. Native American DNA. Check. DNA from the Arctic. Cool. I didn't know that. Explains my love for winter. Some Ashkenazi Jew? I love it" (Boyden, 2017). As I will explain, the phenomenon of pop-up indigeneity, meaning that which is biotechnologically expressed and suddenly emergent, re/iterates indigeneity in terms of a hyper-racialized/ing-gendered/ing (and liberal) identity/difference category by emphasizing the existence of one's descent from an Indigenous ancestor – an ancestor who is typically always female. This ancestry is often unearthed by archival or database research and allegedly decoded by DNA sequencing and analysis. The Canadian case has been receiving increasing media coverage as scrutiny and support of pop-up groups grow.

On June 13, 2018 a CBC investigative report, "Heredity or Hoax?" was released causing a social media storm. The report follows Louis Coté, a man who worked for the Confederation of Aboriginal People of Canada (CAPC) led by Guillaume Carle. CAPC claims to represent off-reserve Aboriginal people in Canada including Indians, Métis, and Inuit. Cote had been in charge of its membership practices. CAPC first came into the media spotlight in 2016 when members of

[25] Here I am not referring to the Métis Nation, but to those who see métis or even Métis as a mixed-race identity.

its affiliated "tribe," the Mikinaks of Beauharnais, Quebec (a middle-class suburb and home to its "chief" Lise Brisebois) were using CAPC self-manufactured "Aboriginal status" cards to receive tax breaks on vehicles by having them delivered to the nearby Kahnawa:ke reserve. The cards resemble status cards that are issued by the federal government in recognition of federally registered Indians and bands. CAPC's cards are reported to state on the back that "This card attests that the bearer is an Aboriginal within the meaning of the article 35 of the Constitution Act of Canada (1982) and can exercise applicable Aboriginal rights" (Noel, 2016). The card then enumerates said rights: "the right to hunt, fish, and trap for food," "trans-border trade and mobility rights in North America," and "treaty-based rights to trade traditional goods" (Noel, 2016). By July 2016, the Mikinaks had reportedly issued approximately 400 membership cards (Hamilton, 2016). CAPC membership requires genealogical ancestry: a lineal family connection to any Indigenous ancestor verified by, for example, a family tree or archival records. Whether some of these ancestors did belong to an Indigenous people has been publicly scrutinized for mistaken identity (Forrest, 2018), and the work of Saint Mary's University sociologist, Darryl Leroux (2019) is increasingly showing that many pop-up Indigenous individuals script Indigenous identities onto French ancestors.

In defiance of such scrutiny, groups like CAPC are increasingly turning to DNA ancestry testing results to evidence Indigenous roots. Having the "Indian gene," as Guillaume Carle purportedly calls it, (Hamilton, 2016) is used as proof of indigeneity in CAPC membership. Carle has explained that for two hundred and fifty dollars, CAPC arranges for prospective members to have a DNA ancestry test conducted by Toronto-based laboratory Viaguard Accu-metrics (Barrera and Foxcroft, 2018; Hamilton, 2016). If the test comes back positive for Native American DNA, the applicant can pay an additional eighty dollars for membership in CAPC,

which includes a membership card. This process has allegedly put up impressive numbers. Carle is quoted as saying that CAPC has roughly 50,000 members across Canada with 90 per cent of them having passed the DNA test (Barrera and Foxcroft, 2018). It would seem that indigeneity, as historical and colonial relations have made it, is possessable – in a sense, just as Harris (1995) famously wrote of whiteness as property, indigeneity as an invention of whiteness, is also a form of property that re/iterates Indigenous peoplehoods according to a possessive logic. In this way, indigeneity can be theorized as an embodied commodity that is becoming increasingly accessible through neoliberal transactions between consumer and DTC genetic testing companies.

With so many positive DNA results coming in, Louis Coté, the whistle blower in the CBC investigative report, said he had become skeptical about the tests and decided to take one himself. He purchased three test kits from Viaguard, swabbed himself twice labeling one as himself and one with his father's name, and, additionally, he swabbed his pet Chihuahua, named Snoopy. When the results came back, Coté and his dog were both found to be 20% Native American: 12 per cent Abenaki and eight per cent Mohawk, respectively (Barrera and Foxcroft, 2018). Daniel Brabant, a former CAPC member from Brossard, Quebec in conversation with Coté, also became skeptical of Viaguard's testing service and sent his dog's DNA sample for testing as well. Brabant's poodle, Mollie, came back as 5 percent Native American: two per cent Oji-Cree, two per cent Saulteaux, and one percent Mississauga (Barrera and Foxcroft, 2018). The company has since explained the DNA results by suggesting that all of the samples provided must have been cross-contaminated with human DNA (Barrera and Foxcroft, 2018).

A neighbouring First Nation, the Mohawk people of Kahnawa:ke is discontent with the rise in CAPC claims to its territory and their presence on it, which according to the Kahnawa:ke Mohawk Council threatens their "title and rights" (Kahnawa:ke Mohawk Council, 2016). The

Council sent a letter to Justice Canada to "officially convey Kahnawa:ke's condemnation of this unrecognized group and their claims over traditional Mohawk Territory" (July 15, 2016 Kahnawa: ke Mohawk Council). In a letter written to Indigenous and Northern Affairs Canada, the Council cites the stakes involved with the development and use of fraudulent Indian status cards on their reserve land: Canada and Quebec stand to lose tax revenues, but for the Mohawks, their sovereignty and self-determination is being threatened. Furthermore, Joseph Tokwiro Norton, the Grand Chief of Kahnawa:ke, has remarked that there is something different between the Mikinaks and others who have been disconnected from their Indigenous communities as a result of colonial policies. He has said that many people with Mohawk ancestry often come to the reserve seeking out family: "They have some relationship with this community, they come here quite often. They have family they know of, a chain that continues" (Norton quoted in Noel, 2016). Norton notices that the Mikinak members are different. They have not shown, he describes, any interest in the community, but rather have recognized themselves as Indigenous and use their cards for perceived benefits. For the Mikinaks and other CAPC members, the existence of an alleged Indian ancestor comes to stand in for locally emplaced and embodied relationships to the historic and contemporary Kahnawa: ke Mohawk Nation. In Norton's rhetorical language, they are, in other words, links-without-chains.

The case of CAPC is not isolated especially insofar as pop-up indigeneity is proliferating in areas of Eastern Canada. Gaudry and Leroux (2017) have termed the occurrence of pop-up Métis identification in eastern Canada as *settler self-Indigenization*. The positioning of Métisness as being ontologically mixed geographically repositions the emergence of "Métis" in Eastern Canada, where contact between Indigenous peoples and Europeans occurred earlier than in Western Canada. Leroux (2019) has extensively surveyed nearly fifty newly formed non-profit

organizations that purport to represent tens of thousands of people as supposedly Métis in places like Nova Scotia, New Brunswick, Quebec, and Ontario. Leroux (2018) has noted that in Quebec, in particular, such groups rely heavily on family genealogies and, now, direct-to-consumer genetic ancestry testing to embolden their claims of being Métis on account of their apparent ancestral mixedness. The Métis Aboriginal Nation Gaspésie, Lower St. Lawrence, the Magdalen Islands, for example, has roughly 10,000 members and has conducted DNA tests to construct a genetic narrative of their occupancy in the region dating back 2,000 years (CBC News, 2015). While experiencing much backlash from the organizations that he studies, Leroux is transparent about his data. He publicly shares his findings through, for example, a lively Facebook Group.

Leroux (2019) has amassed thousands of court documents involved with juridical attempts of these organizations to obtain federal recognition as Aboriginal, including territorial allocation. Pop-up claims of indigeneity are entwined with claims to particular territories and these groups tend to come into conflict with local, historically-situated First Nations in ways that legitimate Canadian sovereignty through appeals for federal recognition. In response to a number of pop-up Métis groups in Nova Scotia, the Assembly of Nova Scotia Mi'kmaq Chiefs (2013) passed a resolution asserting that the Mi'kmaq are the exclusive holders of Aboriginal rights and Title in the province. They have since written a letter to the ministers of Indigenous and Northern Affairs, Justice, and Public Safety attesting to the existence of "Métis" groups in their territories that are fabricating membership cards in attempts to illegally harvest fish and other resources in the area (Assembly of Nova Scotia Mi'kmaq Chiefs, 2018).

The defensive stance of the Mi'kmaq Nation is indicative of what they see as an impending threat posed by newly formed groups claiming to be Indigenous. The perceived threat

of pop-up Métis self-identification is not unfounded as it reverberates into the Canadian policy field. The 2016 census reported an astronomical 51 percent increase in the Métis population since 2006, with the biggest increases found in Quebec (149.2 percent) and Nova Scotia (124.3 percent) (Leroux and Gaudry, 2017; Statistics Canada, 2017). Gaudry and Leroux (2017) explain that the rise in white-Franco Québecois and Acadian Canadians self-identifying as Métis reflects a self-stylized "becoming Indigenous" through the "tactical use of long-ago racial mixing to reimagine a Métis identity" (p. 116).

The recent census numbers are an intensification of what occurred in the five years between 1996 and 2001, when Statistics Canada reported "an astonishing and demographically improbable increase of 43 percent" in the Métis population (Andersen, 2008, p. 347). Métis scholar, Chris Andersen (2008), argues that Canadian census-making generates a standard form of Métisness predicated on a racialized production of an Indigenous "population" rather than a nation and, as such, enables unencumbered self-definition. Andersen maintains that the practice "shears Métis of any national or even historical *political* roots and supplements these with a simple emphasis on mixed ancestry" (p. 359). Andersen's position is shared by prominent Métis leaders like David Chartrand, President of the Manitoba Métis Federation, who has stated, "mixed blood is far different than [being] a citizen of the Métis Nation" (Martens, 2017). The subfield of Métis Studies is increasingly coalescing around Andersen's work.

It is not unexpected that interaction between different peoples with different languages, cultures, political and economic systems, and phenotypic traits results in the interaction of their different elements. As Andersen writes, "[h]ybridity in colonial societies is and has always been a social reality" (Andersen, 2008, p. 39; see also Mawani, 20010; Stoler, 1995; Young, 1995), but how and for what reasons interactions of hybridity emerge are structured through relations of

coloniality. Daniel Voth (forthcoming) and Adam Gaudry (2013) have each explored those relations, for example, through studies of the Canadian founding narrative as being a birth of a mixed or hybrid nation, and how this story eclipses the colonial struggles through which Canada was formed/is forming. In a draft of his forthcoming chapter, "The Race Question in Canada and the Politics of Racial Mixing" Voth extends Gaudry's (2013) work regarding the Métis-ization of Canada as a national mythic narrative. Voth recounts a history of political thought in Canada expressed by the likes of Lord Durham (John George the Earl of Durham), Alan Cairns, James Tully, and John Ralston Saul indicative of racialized/ing-gendered/ing thinking rooted in a logic of mixedness. This way of thinking, he says, has produced and been productive of relations, which solve the colonial Canadian unity problem. Hybridity, in this mixed up iteration of indigeneity, is deployed to capture the contingency of what is perceived as a relationship defined by conflict – that the nation-state's historical difference and struggles over differences require reconciliation. Such reconciliation with its nationalist and individualist claims to racial and political hybridity is deeply gendered. By proclaiming the identities of historical women as being Métis, for example, re/iterates their indigeneity in terms that they (17th and 18th century people) likely did not see themselves as. It is more likely that a woman in the 1600s or 1700s would have had an endogenous way of understanding herself and likely in an Indigenous language of the time. Across the board, racialized/ing-gendered/ing mixedness and the claim that "we are all hybrids" is allotted the capacity to reconcile the former incommensurability of Indigenous and Canadian sovereignties, or even the (not-so) contradictory political systems of liberal democratic nation-statehood and colonialism.

The flattening out of racialized/ing-gendered/ing political relations such as this is particularly effective within spaces of institutionalized multiculturalism insofar as

"[m]ulticulturalism is narrated through the idea that different population groups add value to Canadian society" (Hinterberger, 2012, p. 211). Within the narrative that Canada is and has always been a hybrid nation (a métis-ized multicultural Canada), indigeneity becomes a strategic resource used to maintain patriarchal white possessiveness. To make oneself Indigenous is itself a propertied claim over Indigenous territories through the self-claimed possession of a biological inheritance of rightful ownership. In this sense, mixedness and hybridity are conditioned by relations of coloniality and used in the discursively violent fields of identity/difference politics and the (mis)self-recognitions of pop-up indigeneity. To make matters more complicated, genomic analysis and its power (real and imagined) to decipher Native American DNA, stands to make ancestral mixedness "provable" in ways contrary to long-standing practices of Indigenous ways of relating.

Wetware and Postindigeneity

It is among the re/iterations of indigeneity like Native American DNA that Hokowhitu (2016) advocates for a project of postindigeneity. Hokowhitu (2016) has defined "post-Indigeneity" as "a point where Indigenous scholars and peoples are questioning discourses of power, which have come to define 'true' Indigenous ontologies" (p. 83-84). In this sense, postindigeneity (not to be confused with postracialism) refers to the potent ability of critical Indigenous thinkers, academic and otherwise, to question and upset knowledge about who we are and how those who have an interest in our dis/possession have restricted what counts as our realness. In the way that Hokowhitu defines it, postindigeneity, as an actionable concept, has the potential to strengthen existing efforts directed at Indigenous self-determination. It has become apparent, however, that there is also a worrisome side to the relations of postindigeneity whereby historically non-Indigenous people (e.g., where a historical consciousness of being collectively

Indigenous is lacking) are also challenging modern conceptions of what it means to be Indigenous. As we have seen in this chapter, armed with the equivocality of DTC genetic ancestry testing and Native American DNA, there are increasing numbers of people in North America who are emerging *as* Indigenous in public and policy spheres for the first time as they re/iterate indigeneity in their own image (Leroux, 2019; Gaudry and Leroux, 2017).

Indigeneity, long understood as being constituted by material, politico-historical, and continuous relationships to territories, to family, and among peoples is being measured now (by some) in terms of gene flows, ancestral intensities, and trans-identities. This shift can be understood within the context of Kroker's (2014) observation that today's complex world picture of a posthuman time-space is technologically manifested in "genetic engineering" (p. 2), "virtual augmentation" (p. 2), "3D printing" (p. 9), and "artificial intelligence" (p. 18). These biotechnologies, he maintains, contribute to people's abilities to overcome "the fixed boundaries of . . . identity" (p. 11). Critical theorists are noticing that as human experience becomes increasingly mediated by biotechnological intervention, the rigidity of modern categories of analysis (i.e. race, class, gender, and sexuality) are no longer, in themselves, sufficient for conceptually describing bodies of production (i.e. bodies that are produced and productive). Haraway (2016) describes these contexts in terms of *cyborg politics* involving "transgressed boundaries, potent fusions, and dangerous possibilities" (p. 14). Jodi Byrd (2011) similarly defines *zombie imperialism* to signify today's contexts of power emerging from "the post-racial, liberal democratic apocalyptic vision of pluralistic cosmopolitanism gone viral" (p. 225). To make oneself, not in the image of god, not in the mirror of civic values, but in terms of splice, multiplicity, cyborg: this is the stuff of postindigeneity.

Indigenous studies scholars have elaborated on the North American will to ontologically connect to land, which has given way to the hyper-racialized/ing-gendered/ing postindigenous politics among us. In particular, they reveal that modern life and death and the colonial expansion that generated them left many settlers and their descendants with a sense of disconnection as they made homes in other peoples' territories. Circe Sturm (2002), for example, argues that the will of white Americans to claim Cherokee identity is rooted in a longing to recover some sense of self they feel they have lost. Reardon and TallBear (2012) notice that settler feelings of woundedness, loss, and disconnection have resulted in possessive claims over Indigenous DNA, as they seek out the bio-data of Indigenous bodies for the purpose of helping them find their own human roots (the collective "we"). Modernity was and is the nesting ground for colonial affect, but also, and importantly, for the biotechnologies and possessive relations of power that are available to non-Indigenous people to imagine and assert themselves as Indigenous. Said differently, colonial affect conjoins with the material power of capital and privilege to control one's own subject-making through claims to Native American DNA. Claims of being Indigenous on account of embodying Native American DNA by those who have likely never belonged to an Indigenous people are extending colonial warfare, (borrowing again from Kroker (2014), "to include an important metabolic dimension—an approaching generalized war on the biological terrain of wetware—psychology, subjectivity, and affect" (p. 13).[26] We need not even go so far as to say that pop-up's are not Indigenous, but to recognize that the DNA-based bioeconomy of indigeneity operates through relations of coloniality by relocating

[26] I draw a distinction between those who have no historical self-consciousness of indigeneity and those individuals who have been legitimately dispossessed from their communities due to colonial policy. In both cases, however, claims only to "Native American DNA" outside of emplaced relationships reorder meaning from the complex kinship systems that animate Indigenous peoplehoods.

processes of identification away from Indigenous peoples to the biotechnological and neoliberal economic field.

An affective condition—a colonial pathos—is infecting many nurtured by biotechnologies and perceptions of scientific neutrality and authority that endorse the notion that one can feel and can therefore become Indigenous. Postindigeneiety is made possible through privileged access to liberal and biological relations of self-identification. The commercialization of genomic knowledge in the form of direct-to-consumer genetic ancestry testing, for example, is being used to make and alter the form that identity/difference politics take. Self-identification is possible because of the instruments and relations of patriarchal whiteness that already circulate – iterations of indigeneity, like Indianness defined by blood, that are at different sites and in different fields of production.

The phenomenon of pop-up Métis as one situated re/iteration of hyper-racialized/ing-gendered/ing postindigeneity is perhaps best described, in my estimation, as a "morass" (Kolopenuk, 2018, p. 335): the result of a collision between the relations of racialized/ing-gendered/ing Canadian nation-state-based categorizations (Indian, non-status, and Métis) into which people try to fit themselves; the liberal technology of self-identification; the biotechnologically reoriented spaces of identity/difference; and white affect materialized through the bioeconomy of DTC genetic ancestry testing. Holding this morass together are the sticky racialized/ing-gendered/ing logics about mixedness and nationhood that animate the genetic production of a hybrid sameness.

Additionally, pop-up Métisness reinforces itself through the webs of social networking facilitated through digital technologies, apps, and ancestry websites that coordinate the collectivizing of individual pop-up self-identifications. In ways that confirm Haraway's (2016)

explanation of *cyborg politics*, themselves marked by "transitions from the comfortable old hierarchical dominations to the scary new networks of informatics of domination" (p. 30), newly formed websites, Facebook Pages, and Twitter accounts support the viral outgrowth of pop-up claims and their discontents, proliferating the manufacturing of self-reported legitimacy through the making of digital kin. Consequently, the spatial coordinates of Indigenous citizenship and belonging are being relocated to technological terrains, effectively bypassing preestablished material communities, families, and territories of accountability (i.e., local Indigenous peoples).

The Start

The use of DNA to re/define indigeneity is an indication of the surging technoscientific contexts of the current time-space, in which humans and nonhumans are being exposed to new modes of biotechnological identification schemes. The postindigenous condition marks a host of people mounting (to allegorize Plato) a [space]ship of fools who, armed with digital networking technologies, narratives of mixedness, and DNA test results, are ready to traverse the dimensions of modernity into liminal bodies that bend what is Indigenously real. The colonial spaceship traverses via light through networks of data, across radio waves illuminating the black screens of our devices and our bodies rendered containers of encoded data. Their movement is unanchored to the ontological underpinnings of place and kinship that animate Indigenous peoplehoods. The spaceship drifts like a disembodied plume, ready, to (to express once more in Deleuzian language), reterritorialize wherever it lands. Does this movement indicate a radical politics of postindigeneity envisioned by Hokowhitu, or an invasion of android colonizers whose biological knowledge and technologically interpolated bodies pursue the end of indigeneity as many of us currently live it?

Some citizens of Métis and First Nations may take no issue with newly formed pop-up Indigenous organizations on account that they are not committed to the rigidity of categorical identities that are prefigured through relations of coloniality. However, what must remain accounted for among pop-up claims is their inattention to the distributions of power when indigeneity is rendered exceedingly relative—when the markers of indigeneity, like family, history, and territory, cease to matter. Singularly, the stakes of pop-up postindigeneity might not be immediately evident to many, but combined with other biotechnological re/iterations of indigeneity, there is no doubt that they are accumulating into a net(working) effect: a new arsenal among colonial/posthuman relations of dis/possession.

Chapter 4

Pathological Relations: Indian Tuberculosis, Biomedical Research, and Bioethics

PART 1

In 2013 Dr. Mary Jane Logan McCallum, a historian at the University of Winnipeg, was in the early stages of her project, "An Indigenous History of Tuberculosis in Manitoba, 1930-1970." I was living at home in Winnipeg at the time, riding out the year between my graduate programs and was able to do some research with her. I completed archival work for Dr. McCallum, surveying over 500 Manitoba newspaper articles spanning the 1930s to 1960s, as well as reviewing the Manitoba Sanatorium Board's *News Bulletin* published from 1959-1969. During those decades, Manitoba had among the highest rates of tuberculosis (TB) compared to Canadian national averages and the province became a sort of litmus test for Canada's ability to deal with the disease. My grandmother's generation had lived through the time period and geographic locations that were central to the research project and, not surprisingly, learning about the history of TB in the province was one of great personal interest. The newspapers were filled with racialized/ing-gendered/ing accounts of infected/ious bodies whose Indian blood, however trace an amount, supposedly made them more susceptible to contracting *and* transmitting TB. Fear of Indians among neighbouring white communities grew. These accounts uncomfortably told a much different story of the causes of disease than the ones I knew: namely, conditions of hardship and poverty, racism, gender-based violence, and colonial institutionalization (e.g. residential school) that would cause members of my own family, at times, to get sick.[27]

---

[27] See Henry, LaVallee, Van Styvendale, & Innes (2018) for research regarding colonial conditions affecting health in global contexts.

Three years later, when starting research for my dissertation I became aware of a body of scientific papers investigating the role that genetics might play in explaining (still) higher rates of tuberculosis among Indigenous peoples on the Prairies. Given my previous knowledge of the racialized/ing-gendered/ing narrative around TB susceptibility in Canada and its contribution to a racist fear of the Indian (as) contagion, I wondered if and how 19th to mid-20th century logics of pathological heredity play a role in shaping 21st century biomedical research through the newer analysis of genomics. In order to inquire into the possible epistemological legacy of race thinking, I put two studies about TB and Indigenous peoples in Western Canada into conversation: one, historical and well-known, published by R. G. Ferguson in 1928; the other, contemporary and published by Linda Larcombe and her research team in 2008. The analytical intent of positioning these studies in relation to one another is not to disparage any one researcher or any one study as being racist. The focus on their relationality, rather, frames these studies as clear connection points within a larger scientific genealogical network that help me to 1) map the continuity and ruptures of biomedical knowledge and health policy that produce racialized/ing-gendered/ing knowledge about indigeneity and TB in Canada in the form of pathological re/iteration, and 2) understand how they (the studies) fit into a broader colonial field that tends to abstract technoscientific knowledge from the colonial relations through which it is generated that produce one-dimensional biotechnological responses to infectious disease. These responses, after all, have never been able to eradicate higher rates of TB among Indigenous peoples. In Part 2 of this chapter, I will further examine the bioethical contours of 21st century biomedical research regulation attentive to how they fail to address the relations of racialized/ing-gendered/ing re/iteration that they have been made through and, consequently, continue to make.

Historians of colonial medicine have shown that, more than any other disease, TB is a colonial one. It both thrives *within* colonial conditions of poverty, inadequate housing, psychological stress, and historical trauma (Moffatt, Long, and Mayan, 2013), and *as* a racially-scripted problem *of* indigeneiety, expressed in terms of an Indian problem (Mosby, 2013, p. 147). The racialization of TB and racialized/ing-gendered/ing biomedical infrastructure designed to combat it has contributed to the proliferation of Canadian Indian policy and the Canadian health care system. I will explain that the "technical" and techno-scientific "problem-oriented approach" (Nadasdy, 2005, p. 223) that biomedical (in Part 1) and bioethical research protocols (in Part 2) operationalize to address the colonial politics of disease remain unable to transform the racialized/ing-gendered/ing politics of re/iteration in the biomedical field and beyond: they are in a pathological relation.[28] This limitation will be explored in the context of three factors: the materialization of racialized/ing relations within certain Indigenous bodies by way of the infectious disease tuberculosis; the re/iteration of indigeneity in scientific journal articles about tuberculosis; and (in part 2 of the chapter) the development of a liberal subjectivity through which Indigenous research participants are required to contract into biomedical inquiry via bioethical procedures of consent.

In his original and French edition of *L'an V de le Révolution Algérienne*, Frantz Fanon (1959) pointed out the deep investment that medical institutionalism has in colonial dis/possession: "in centers of colonization the doctor is nearly always a landowner as well…the doctor is a settler" (Fanon, 1965, p. 133). Like the relational production of science and colonialism (discussed in Chapter 1), the medical field has not been an instrument of colonial

[28] This concept was coined by Paul Nadasdy (2005) with respect to conservation biology and environmental management.

power, but rather has been produced in mutual relation to the colonial field. McCallum and Perry (2018) extend the notion that medical institutionalism, including modern-day health care systems, remain constitutive of the colonial infrastructure in Canada. They demonstrate that deeply embedded in Canada's health care system exists anti-Indigenous racism and a politics of racialized/ing-gendered/ing re/iteration. According to McCallum and Perry (2018), when an Indigenous person seeks medical treatment in the Canadian health care system, they are, more than not, seen as representative of an "Indigenous population" and vice versa. This politics of representation can invoke, in health care workers, racist feelings ranging from hostility to indifference toward Indigenous patients (McCallum and Perry, 2018). The consequence of such reactions and their effects, which can be tantamount to medical neglect, has meant that Indigenous patients will, at times, die needlessly while they are in care.[29]

There is a growing literature in the history of medicine regarding the role that mycobacterium tuberculosis, and the treatment of it, have played in building Canada and its incumbent health care system (MacCallum and Perry, 2018, p. 14; Lavalee, 2014; Meijer Drees, 2013; Moffatt, Mayan, and Long, 2013; Hackett, 2012; Hodgon, 1982). In the set of relations presented here, I explore how biomedical research of tuberculosis among Indigenous peoples is shaped through a racialized/ing-gendered/ing logic that contributes to re/iterating meaning for indigeneity in a way that gets refracted into health policy and clinical practice. I argue that current genomic research about Prairie and Northern Indigenous peoples and TB re/iterates the Indigenous body according to a p/resumed racialized/ing-gendered/ing fragility. As a result,

[29] McCallum and Perry (2018) discuss the death of Brian Sinclair, who passed away while sitting in the waiting area of the Health Sciences Centre in Winnipeg, Manitoba for more than thirty hours in 2008.

racial stereotypes in research are generating partial data about Indigenous peoples that lack the positive potential to impact health outcomes. Biomedical research is not typically examined among scholarship, media, and policy in relation to anti-Indigenous racism in Canada's health care system. Therefore, I will analyze how the advent of the sequencing of the human genome at the century's turn has meant that the biomedical researcher joins the doctor (who, at times, used to be one and the same) in embodying the indelible connections between biomedical knowledge and colonial relations of dis/possession.

Healthy Reconciliation

When the Human Genome Project (HGP) was completed, scientists publicized a unified message – that the results of the study disproved the biological existence of race (Koenig, Soo-Jin Lee, and Richardson, 2008, p. 1; Clinton, 2000). Knowledge of the human genome indicated, at that point, that, as humans, we are one species. President Bill Clinton explained at the announcement of the HGP's conclusion: "I believe one of the great truths to emerge from this triumphant expedition inside the human genome is that in genetic terms, all human beings, regardless of race, are more than 99.9 percent the same" (Clinton, 2000). Rounding out President Clinton's announcement, Britain's then Prime Minister Tony Blair, assured that "we, all of us, accept the responsibility to make these [genomic] advances work for all our people in all our countries for the common good of all humankind" (Blair, 2000).

It has been through the study of the same/human/ness celebrated by Clinton and Blair that scientists and policy-makers have since anticipated that genomic knowledge will lead to unprecedented and transformative improvement in biomedical research, clinical practice, and ultimately, human flourishing (Duster, 2012). The promise of improved public health by way of increasingly precise diagnostic and treatment capabilities continues to justify much ongoing

genomic research in a variety of fields, including biomedicine. Acknowledging the relations between the production of research and clinical knowledge/practice, Science and Technology Studies scholars, Kaushik Sunder Rajan and Sabine Leonelli (2013) define biomedicine as "the set of practices that brings biological and clinical knowledge, norms, tools, and procedures to bear upon each other" (p. 464).[30] Furthermore, the growing discourse of human biological unity has led to an accompanying moral and political purpose propelled by the idea that the inclusion of diverse voices and bodies in biomedical research can offer a pathway toward also historical and cultural reconciliation (Boyer et al., 2011). In liberal democracies, like Canada, biomedicine is linked to its emergence in and of a colonial context, and now, inf/l/ected with a moral claim: that genomic research is good and justified in the interest of public health, a sort of meta-value itself (Hinterberger, 2012, p. 206).

Endowed with a cosmopolitan purpose - common humanity and a moralizing of healthfulness - significant financial investment in genomic research has and is being made in most modern (bio)industrial countries. In Canada, following the Tri-Council Agencies, Genome Canada receives on average 63 million dollars per year in federal funding (Naylor Report, 2017, p. 6). Investment in genomics research continues to rise with the Government of Canada announcing an investment of another 255 million dollars in projects devoted to precision medicine involving federal and provincial governments, as well as research institutions and

[30] Sunder Rajan and Leonelli (2013) identify the need to reconceptualize the co-production of knowledge and value in the shaping of a global post-genomic biomedicine. For them, this inquiry is especially warranted in the context of the increasing corporatization of the biotechnology industry since the 1970s. Biotechnology (opposed to basic or pure science) takes up the attention of most genomic researchers, which is "increasingly seamlessly integrated with commerce, state industrial policy, transnational corporate business, and related agendas" (Munsterhjelm, 2014, p. 47).

private sector partners (Genome Canada, 2018). Despite the combined financial and moral support that genomic research receives, the reality in the past decade is that massive amounts of biomedical data have been generated, but very few health benefits have been yielded (Sarewitz, 2016, p.32). Specifically, very few "genes underlying susceptibility to common diseases or influencing drug response have been identified" (Risch, Burchard, Ziv, & Tang, 2002, p. 2). Even as genomic knowledge has transformed the field of research in biomedicine, it has not (yet) transformed clinical practice. It would seem that the initial and wide-reaching promise that genomic research offered to healthfulness still lay within a growing, yet unrealized set of potentialities. And while DNA-based biomedical research has translated into few health benefits generally, it has resulted in even fewer for Indigenous peoples (and other differently labelled marginalized populations). Indigenous peoples remain underrepresented among genomic biomedical research and, therefore, experts in the field argue that they will continue to benefit the least from advances in precision medicine (Claw et al., 2018, pp. 1-2).

On account of cross-sectional underrepresentation among genomic biomedical research, increasingly, there are scientists, including Indigenous geneticists,[31] who advocate for the inclusion of Indigenous peoples (and other marginalized populations) into biomedical research studies. What have become understood as races *do* have, they assert, population-level differences in their biology that require study and analysis in order to develop and provide materially relevant health care for all (Bamshad, 2005; Risch, Burchard, Ziv, & Tang, 2002, p. 2). The anticipated promise of improved public health *for all* has signaled a genomic paradox: that

[31] Kanaka Maoli geneticist, Keolu Fox, for instance, calls for research among and offers services to Indigenous communities grappling with genetic/genomic projects through his not-for-profit organization, IndiGenomics.

collective (defined by the human genome) access to healthfulness must account for the molecular *particularities* within human bodies and between human populations.

Epstein (2007) points to this paradox from a different angle: difference, once medically studied in ways that/to evidence innate superiority and inferiority between bodies (i.e. male/female, white/Indian), is now held up as a reality needing biomedical attention in order to secure the liberal democratic value of egalitarianism (in and via health) (p. 13). On that front, and in Canada, biomedical research has become a site where addressing colonial health disparities between non-Indigenous and Indigenous peoples promises reconciliation. As Hinterberger (2012) argues, the underlying logic of a liberal biomedicine suggests that "[b]y curing the ills of certain populations, genomic research will also cure the ills of an unjust society" (p. 206). This form of reconciliation has been amplified by Prime Minster Justin Trudeau's recent apology to Inuit peoples for the Government of Canada's mid-century federal policy on tuberculosis (see for instance CBC News, 2019).[32] To map the relations connecting reconciliation, (genomic) biomedical research, and indigeneity, we can look at one case whereby biomedical research is undertaken to address the syndemic occurrence of tuberculosis and colonialism. The intention here is not to outline a history of tuberculosis in Canada. Historians have and continue to do exceptional work in these areas (e.g. McCallum, 2017; Lux, 2001, 1998). Instead, this chapter draws on their work to offer a critical Indigenous theory of the colonial politics of representation among TB-related biomedical research and policy.

Fielding TB Research about Indigeneity in Canada

[32] See Coulthard (2014) for an analysis of the role that apologies play in contemporary recognition-based models of reconciliation.

In what has become a famous articulation for the need for research methodologies that do not extract, exploit, and under-serve Indigenous peoples - in a word, research that is not *colonial* - Linda Tuhiwai Smith (1999) first wrote: "Research is probably one of the dirtiest words in the Indigenous world's vocabulary (p. 1). This utterance resonates across colonial contexts in which dichotomies of indigeneity/whiteness and disease/health have emerged through and as biomedical knowledge and, in relation to that knowledge, the institutionalization of national and provincial health care programmes. No more could the production of these dichotomies and their institution-based co-dependency be evident than in the history of medical research in Canada. Canadian medical and colonial science historians have demonstrated that from the Fur Trade to the post-war period, knowledge of disease and indigeneity have been generated with colonial policies and practices. As such, disease and the treatment of it have contributed to shaping colonial relationships between Indigenous and non-Indigenous peoples (Lux, 1998, p. 278).

Over thirty years ago, Jane Buikstra's edited volume *Prehistoric Tuberculosis in the Americas* showed that "tuberculosis was endemic to the [so-called] New World [prior] to the arrival of Europeans," (Daschuk, 2013, p. 2) including in the territories that became known as Western Canada (see also Dashuk, Hackett, and MacNeil, 2006, p. 309). The Canadian Tuberculosis Standards, 7th Edition (2014) (the policy document, which acts as a consolidation of expert data about TB across the country and as a guide for health care professionals) cites a 1987 study, which found that "North and South American human remains dating from the time of pre-European contact show anatomic and radiological evidence of mycobacterial disease and *Mycobacterium* tuberculosis complex has been identified" (p. 346; also, Clark, Kelley, Grange, & Hill, 1987). Medical historians (Daschuk, 2013; Maud, 2013; Mosby, 2013; Hackett, 2002; Lux, 2001) have respectively shown that even though Indigenous peoples in North America had

been exposed to the tubercle bacterium prior to contact with Europeans and throughout the Fur Trade, it was not until the 1880s when some Indigenous peoples became Indians within the meaning of Canadian law, intentionally starved, and confined to sedentary life in overcrowded and sub-standard housing on reserve that tuberculosis became the dominant bacterial threat posed to Indigenous bodies. Mycobacterium tuberculosis, after all, lives well in colonial conditions of malnutrition, exposure, and poverty (Lux, 2001). The sedentary lifeway on reserve necessitated the development of technoscientific biomedical responses to treat and contain the disease.

The 1928 study "Tuberculosis Among the Indians of the Great Canadian Plains" conducted by Dr. Robert George Ferguson (who led federal efforts in the early to mid 1900s to combat TB among Indians) is a well-known and informative example of the ways that biomedical inquiry has, itself, been shaped by colonial thinking. Ferguson believed that the ability to resist TB was acquired as a hereditary trait. He presumed that Indians were inherently more susceptible to contracting TB due to not having been exposed to the disease for as long as white Europeans had been. He likely would not have been able to know at that time that, indeed, *Mycobacterium* tuberculosis *had* been present on the Plains prior to the arrival of Europeans and only proliferated after *Indian Act* policy took effect in communities. After studying three generations of Cree and Assiniboine families at the Qu'Appelle and File Hills Indian agencies, Ferguson's study concluded that among Indians, "The introduction of white blood is not only a potent factor in civilizing primitive people, altering habits of living, appetites, and desires, but also has a noticeable effect on increasing their resistance to tuberculosis" (Ferguson, 1928, p. 18). In the United States, studies were also completed to determine the link between Indian blood quantum and one's corresponding degree of susceptibility to TB (see for example, Warner,

1932).[33] As the logic went, any trace of Indian blood one embodied, increased one's likelihood of contracting TB and that the incorporation of whiteness, both biologically and culturally, could improve the Indian's primitive state, including his constitution and "primitive living conditions" (Simes and Paynter, 1934, p. 498).

The making of a public health problem of Indian tuberculosis was connected to the broader eugenic curiosities of basic science in the early twentieth century. Reginald Ruggles Gates, a dominant figure of British race science, who happened also to be Canadian (Lux, 2001, p. 7), published in 1928 "A Pedigree Study of Amerindian Crosses in Canada" in *The Journal of the Royal Anthropological Institute of Great Britain and Ireland*. As previously discussed, Gates was interested in the effects of white and Indian miscegenation and, especially, whether Indians who were mixed with white blood became more elevated on the scale of civilization; and, conversely, if the addition of Indian blood degenerated white people to a more primitive level. Theories of racial inferiority were part of a global colonial interest in the susceptibility to disease among primitive races (McMillen, 2008, p. 613). As Elizabeth Grosz (1994) reminds us, this interest can be understood as having been conditioned by the history of what has become known as Western thought. Especially among the Christian tradition, immateriality (morality) and materiality (physiological disorder) were fused together (p. 5). Diseases of the body were believed to be caused by the disease of the soul: sin. Among colonial modernities, the configuration of the inevitability and consequence of disease were racialized/ing-gendered/ing

---

[33] By the 1840s, Scientific studies such as these generated a scientific and political discourse among the post-revolutionary United States "that the Indians were doomed because of innate inferiority, that they were succumbing to a superior race, and that this was for the good of America and the world" (Horsman, 1986, p. 191).

and linked to the morality of health and, as would have it, the naturalized patriarchal-white possession of the nation-state.

Associated with medical and scientific interest in cross-race/gender interaction, public fear grew out of the confidence that Indians and their TB were a threat to neighbouring white communities who could fall ill or intergenerationally more susceptible as a result of their physical proximity to reserves (Lux, 2001, pp. 189-224). Interventions against Indian TB were, in part, motivated by the self-interest of the nation-state to protect its citizens and its emerging land-base. Therefore, in addition to the fear of contagion, Indian policy directed at addressing TB contributed to reordering the political relationship between Indigenous peoples and Canada into a legal framework of white humanitarianism. Through the prism of a shared humanity, morality compelled Canada to offer aid to Indians in the face of epidemic disease.

While knowledge of the heredity of disease and policies of "an informal and extra-legal regime ensur[ing] that the social taboo of racial [and gendered! as we saw in Chapter 2] intermixing was kept to a minimum" (Thompson, 2008, p. 1; see also Walker, 2000; Backhouse, 1999; Walker, 1997) could be used to offer solutions for future generations, other measures were needed to contain disease among those already living. In 1933, Ferguson, in the capacity of medical superintendent of the Qu'Appelle Sanatorium in southern Saskatchewan administered a *Bacillus Calmette–Guérin* (BCG) vaccine trial among local Indigenous children. Lux (1998) has shown that this trial was a way to experiment on disempowered research subjects in order to gain insight into the effectiveness of the BCG vaccine (which, was still unknown). Research on Indigenous bodies has contributed to producing iterations of indigeneity according to a racialized/ing-gendered/ing impulse and also to overall biomedical knowledge and its institutional structuring.

Mosby (2013) describes how colonial connections between disease, biomedical institutionalism, and the material life chances of bodies endured into the twentieth century. He explains that during the second world war and early postwar period bureaucrats, doctors, and scientists recognized the problems of hunger and malnutrition among Indians, yet increasingly came to view Indigenous peoples as "experimental materials" and residential schools and communities as kinds of "laboratories" that they could use to pursue a number of different political and professional interests (Mosby, 2013, p. 148; see also Hadden, 2018). Colonial administrators, including Percy Moore who, during mid-century was the superintendent of Medical Services for Indian Affairs and Director of Indian Health Services Branch, held up advances in biomedicine "as a means of easing the "'Indian's" transition from 'traditional' to 'modern'" (p. 170). In the treatment of TB, medical personnel and Indian Affairs bureaucrats have tended to push for expert-driven biomedical solutions to high morbidity rates such as the BCG vaccine, as mentioned, but also procedures like pneumothorax, and eventually pharmaceuticals like antibiotics as means of helping Indians join the progress of modernity on an embodied level (p. 170).

The belief that the Indian's racialized/ing-gendered/ing constitution, his body and culture, was in a less evolved stage than that of white Europeans and Euro-descendants resulted in policies that paired physical rehabilitation *with* cultural reform in the treatment of disease. The case of tuberculosis provides a clear evidential basis for this interpretation whereby sanatoria, in addition to Indian residential and day schools, prisons and jails, and hospitals, became key sites for the assimilative institutionalization of Indigenous peoples in Canada (Lux, 2016). Connected to the discourse of progress, presumed racialized/ing-gendered/ing fragility played a role in forging a narrative about Indians as being a vanishing race that would be inevitably lost along the

evolutionary road (Dashuk, Hackett, & MacNeil, 2006, p. 310). These assumptions are connected to what Lux (2001) calls the collapse theory, which asserts the historical and essential vulnerability of Indigenous peoples (pp. 13-14). This discourse would persist through the twentieth and into the twenty-first centuries beyond the context of TB (e.g. *Indian Act* "marrying out" rules, HIV/AIDS, diabetes).

The persistence of Lux's collapse theory has been refurbished, however, by biological anthropologists in a way that justifies their interest in studying the DNA of Indigenous peoples before it is lost to the force of admixture, or in other words, through biological reproduction with non-Indigenous peoples (TallBear, 2013). The essence of indigeneity as being fragile operates, in a perhaps less explicit manner, through biomedicine's epistemological *a priori* – its racialized/ing-gendered/ing pre-conceptual order. I am interested in the degree to which tuberculosis has been racialized/ing-gendered/ing since at least the 1890s and enduring into the 21st century (MacCallum, 2017; McMillen, 2008; Lux, 2001, 1998): that TB is a problem *among* Indians and *of* Indianness (Stewart, 1939, p. 12). While historically, the Indian's professed inability to resist TB emerged as the biologically threatening part posed by Canada's Indian problem, contemporarily, TB morbidity rates (see below) among Indigenous peoples in Prairie and Northern communities signal an obstacle for reconciliation.

Moving Blood and Genes

The direct analysis of DNA would transform the study of biology, and from the 1940s and into the 1950s, medical genetics research grew with the intention to inform clinical practice (Leeming, 2004, p. 482). In Canada, the first genetic counselling clinic opened in 1947, and by 1989, medical genetics became an independent specialty according to the Royal College of Physicians and Surgeons Canada (p. 481). Among this shift, although not linked to the

explanatory potential of genetics, into the 1950s, the belief that Indigenous peoples embodied a racialized susceptibility to TB nearly faded away due to its own weak explanatory power, and the inconsistent and inaccurate ways that Indian blood quantum was operationalized in research and policy (McMillen, 2008, pp. 610, 612). By the 1960s, medical professionals became aware that poverty and crowded living conditions, not innate racial inferiority, were the main causes of tuberculosis. These logics dominated expert biomedical knowledge at the time. As I will explore, however, the tethering of race and disease, which reached a height in the 1940s, would go on to contribute to shaping an enduring biomedical longing that seeks to explain away TB among Indigenous peoples by identifying a shared racialized/ing-gendered/ing fragility, a pathological heredity. In the 21st century, however, heredity is not understood according to blood per se, but according to DNA (López Beltrán, Ventura Santos, Restrepo & Wade, 2014; TallBear, 2013).

Although overall rates of TB morbidity declined widely in Canada after the 1960s, tuberculosis continues to be a public health concern among Indigenous peoples, and especially, for (some) First Nations in Saskatchewan and Manitoba and for Inuit communities in Nunavut (Fitzgerald, Wang, & Elwood, 2000; Canadian Tuberculosis Standards, 2014: n/p). Indigenous people make up approximately half of Canadian-born cases of TB despite making up only about five percent of the total population (Komarnisky, Hackett, Abonyi, Heffernan, & Long, 2016). There have been disproportionate rates of morbidity reduction in the country as well. Between 1970 and 2010, the proportion of active TB cases in the Canadian-born non-Indigenous population decreased from 67.8% to 11.8%. During the same time period, the proportion among Canadian-born Indigenous people increased from 14.7% to 21.2% (Canadian Tuberculosis Standards, 2014, n/p). Inadequate living conditions that, in many cases, still persist have become abstracted in today's biomedical field from their coloniality and understood in the field of public

health, instead, in terms of the social determinants of health and, potentially, genetic susceptibility.

The need for new approaches in the treatment of TB is emerging and the rise in genetic research may indicate a response to the productive capacity of microbials themselves expressed by the growth of antibiotic-resistant strains of TB (World Health Organization [WHO], 2018). Among new approaches, there is a body of biomedical research that explores the role that genetics might play in explaining high rates of tuberculosis among Indigenous peoples in North Western Canada. Yet, even as biomedical research shifts into the new paradigm of genomics, there remains an epistemological pattern spanning over 100 years in Canada of the type of biomedical research that is prioritized with regard to Indigenous peoples and tuberculosis. This pattern functions according to a racialized/ing logic that re/iterates indigeneity as being vulnerable to the disease, and thus constitutionally more fragile in comparison to ambiguously defined whiteness. As I argue in the next section, by situating biomedical knowledge within the colonial history of Canada, I wish to point out the stark similarity between 20th and 21st century biomedical knowledge generated about Indigenous peoples.

Pathologizing Genetic Relations

The study titled, "Functional Gene Polymorphisms in Canadian Aboriginal Populations with High Rates of Tuberculosis," was written by Linda Larcombe and her research team and published in 2008. The research was funded by the CIHR and the National Sanatorium Board and published the year following the CIHR's release of the *Guidelines for Health Research Involving Aboriginal People* (which will be discussed in part 2 of this chapter). The researchers report that proper ethical procedures were followed throughout the study: participants gave individual consent alongside of band councils and the university ethics board approved the study.

The researchers examined tuberculosis among members of Dene and Cree cohorts in northern Manitoba and compared their biological samples with that of "healthy Caucasian persons" (Larcombe et al., 2008, p. 198). The sample sizes for the Cree, Dene, and Caucasian populations were 42, 61, and 91 respectively. The researchers analyzed single-nucleotide polymorphisms (SNPs) – these are small sections of certain genes – that have been associated with susceptibility and resistance to disease. In particular, they looked at certain sections of key genes that have been associated with an increased risk for TB in certain "ethnic groups," (p. 1) including broadly labeled "West Africans," "Mexicans," and "Gujarati Asians in London" (pp. 1, 5). The narrative in the study's justification was that for those small groups of people in those isolated studies, there has been some evidence that genes impact ability to resist TB. Therefore, the researchers endeavoured to look at those same regions in Cree and Dene cohorts and compare them to "healthy Caucasians" who were presumed to have the most optimally embodied resistance to the disease.

When placed in the history of indigeneity and colonialism as they specifically relate to biomedical knowledge of tuberculosis, the logic of the study appears to be indirectly shaped by that of the 1928 Ferguson study. Like in Ferguson's research, TB resistance/susceptibility in the 2008 Larcombe study is believed to be hereditary. Both studies begin from the premise that Indigenous peoples are more susceptible to tuberculosis due to their apparently short historical contact with the bacterium (even as the bacterium themselves have been in a state of becoming in such a way that, by definition, no one has necessarily been exposed to them in their identical historical forms). This assumption is particularly troubling in the Larcombe study considering that it is now known that Mycobacterium TB was present in North America, and on the Northwestern Prairies prior to the arrival of Europeans. The Larcombe study does not inquire

into the length of time or the contexts through which those particular Cree and Dene communities have been exposed to the bacterium, or which particular strain or strains are prevalent among them. Larcombe and her team were not alone in their assumption of Indigenous immunological fragility (linked to the collapse theory).

Another study, "Linkage of Tuberculosis to Chromosome 2q35 Loci, Including *NRAMP1*, in a Large Aboriginal Canadian Family," by Celia M.T. Greenwood and research team proclaims that "people of European origin have a high level of resistance to infection by *M. tuberculosis*, because of selection for host resistance over 300 years, whereas Aboriginal American populations may be more susceptible" (Greenwood et al., 2000, p. 405). McMillen (2008) offers insight into the blind acceptance of the logic of immunological fragility in these studies: early twentieth century race science (like R.G. Ferguson's research) "is relied on as evidence of the validity of virgin soil theory" (p. 642). The virgin soil theory in which at contact, Europeans brought bacterium with them that Indigenous peoples had no acquired immunity for has played a historical role in also the collapse theory both anticipating that the Indian was doomed for extinction.

The connection between generations of research is, then, we could say, epistemological. It is also, however, directly citational at the highest levels in the biomedical field. Long and Lau (2016), for example, published an article regarding the advancements made by R. G. Ferguson in the section "Founders of our Knowledge" of the *International Journal of Tuberculosis and Lung Disease*. They describe him as "a pioneer in the fight against tuberculosis (TB) in North America" (Long & Lau, 2016, p. 1285) and they regret that his studies cannot be reproduced today since "[t]he virgin soil circumstances under which Ferguson performed his studies" (p. 1287) are long past.

Even as contemporary studies rely on Ferguson's data, 21st century biomedical knowledge differs slightly from studies of inherent racial susceptibility. It does not assume the essential nature of race-based differences between groups, but rather assumes that biology, including genes associated with disease susceptibility, are an evolutionary-dependent materiality, and as such, populations have adapted uniquely to various environmental conditions. However, the explanatory basis of biogeographical and population level variation, like the nineteenth and twentieth century knowledge of hereditary disease, continues to posit a pathological kinship that connects generations of Indigenous bodies together in interaction with infectious microbes. The political implications of re/iterating indigeneity as being "genetically susceptible," has been shaped by the very racialized/ing-gendered/ing logics, knowledge, and policies that have sought to naturalize possessiveness in justification of patriarchal white sovereignty.

There is more residue left to unpack from Ferguson's era and its implications for genomic research. In Ferguson's study, Indian blood was compared to white blood as the norm against which heredity/primitive resistance was evaluated. In the Larcombe study, isolated SNPs (sections of DNA) of Cree and Dene populations were compared to Caucasian SNPs. The comparisons conjoin into a vision in which the achievement of biomedical research (who gets studied) and in healthfulness (who benefits from the research) limits the possibilities of living beyond the standard of white embodiment. Genomic research such as this occurs on a different scale of racialized/ing intensity than earlier race science (hyper-racialized/ing-gendered/ing) by being a more refined understanding of blood as a unit of heredity. Studies which relied on blood to materially symbolize inheritance also relied on phenotype to determine its quantum; those that rely on DNA, rely on genotype, particular sequences of nucleotides.

Larcombe's use of unspecified Caucasian genes as the study's neutral comparator group is problematic for the obvious reason of the hierarchical positioning of difference that results when non-white bodies are compared to white bodies and without any attention paid to the intra-population variation that exists among them. It is also problematic for the future of TB treatment. If past biomedical responses, like antibiotic medication, are indicative of the ability of "technical problem-oriented approaches" (Nadasdy, 2005) to, on their own address colonially caused morbidity rates, the promise of gene therapies in the treatment of TB only offers a partial solution at best. Biomedical research and technologies do not tend to address the relational production of colonial and biological orders. This consideration would involve inquiry into how re/iterating indigeneity as constitutionally fragile, whatever its cause, leads to narrow health care policies and biomedical practices that target the supposedly pathological Indigenous body, rather than, the pathological colonial relations which shape the political, socio-economic, ecological, biological, and discursive forces through which healthy and unhealthy bodies are produced (let alone the notion of healthfulness itself which is built through illusions of embodied purity).

It must be stated that both studies, Ferguson and Larcombe, fail to definitively prove a biological basis for higher rates of tuberculosis among Indigenous peoples. The Larcombe study identified *some* genetic variation (or difference) between all of the cohorts (the Cree, Dene, and healthy Caucasian), but it did not definitively identify a genetic cause for TB susceptibility among the Cree and Dene sample groups. The report concludes that "what remains unclear is the basis for the different rates of tuberculosis among various ethnocultural populations" (Larcombe et al., 2008, p. 3) and therefore more research on the role of genetics in TB susceptibility is needed (p. 3). Even if the Larcombe study *had* found definitive proof that TB susceptibility is influenced by genetic factors among the small Cree and Dene cohorts studied, the results could

not be statistically generalized to a larger population, including one that might be defined as "Indigenous:" if you recall, the study sample sizes were 42 (Cree cohort) and 61 (Dene cohort).

While the study was unable to provide a clear and direct understanding of the role that human DNA might play in TB susceptibility, it generated discursive power and practical influence as it moved into other positions of the biomedical field. The latest edition of the Canadian Tuberculosis Standards (2014) (which as a reminder, is the document, which acts as a consolidation of expert data about TB across the country and as a guide for health care clinicians) includes "genetic factors" (p. 345) on its list of determinants of TB among Indigenous peoples. The Standards specifically cite the Larcombe study as evidence for its claim. The shift from blood to genes in the story about TB and Indigenous peoples marks a shift in biomedical knowledge with respect to the materiality of (racial) heredity. Biomedical expertise has, in other words, it can be argued, gone from a belief in pathological Indian blood to Indigenous patho-genes identified by their difference from whiteness. While biomedical common sense has not changed much with respect to disease causation, the scale with which it sees the problem and solution has. Colonial knowledge of tuberculosis has not been revolutionized in light of DNA analysis, rather, it has intensified via scaler mobility.

Chapter 4

Pathological Relations: Indian Tuberculosis, Biomedical Research, and Bioethics

PART 2

In Part 1 of this chapter, I explored that while races do not exist essentially, the ways that people have been divided and treated differently on the basis of race *does* differentially impact the materiality of bodies. As such, it is necessary to critically consider the ways that racialized/ing-gendered/ing knowledge orders relations between bodies and also *within* them. In the case of tuberculosis, the bacterium themselves are anything but passive actors in the materializing of race, and would defy biomedicine's technoscientific assaults to infect some bodies more than others. Nowhere else is their microbial agency clearer than in their becoming resistant to antibiotics. The bacterium are productive, reordering relations within the body and among the biomedical research and policy fields that plot against them. They make bodies into Indigenous ones by converging with the discursively powerful ideas of race to produce (indigenously) pathological relations.

In Part 1, I also explained that an enduring biomedical logic routed through racialized/ing-gendered/ing re/iterations of whiteness, heredity, health and disease have re/produced indigeneity according to a presumed inheritable fragility, itself a threat to the superiority of white immunity standards (e.g. through hetero-race/gender miscegenation). This basis of knowledge proves insufficient for addressing the multifaceted politics of colonial disease/the disease of colonialism. Research with and about Indigenous peoples travels beyond its labs of production, and can generate force among the broader biomedical policy and clinical fields. Yet, biomedical research is not often critically engaged with among scholarship regarding anti-Indigenous racism and inequity in the healthcare system. It needs to be.

Extending my analysis of the production of bodies in and of biomedical research, Part 2 of this chapter explores how *bioethical* values and protocols also require critical analysis for their generative relations among genomic research. I am analytically concerned with the ways that bioethical procedures cannot alone account for the legacies of colonialism and anti-Indigenous racism in the health care system, including the biomedical knowledge (especially its epistemological *a priori*) that clinicians rely on. In particular, I am concerned with the productive force operating discursively and the epistemological limits of bioethics. I argue that the liberal values shaping the field of bioethics tend to control subjectivities that are required to consent to the h/elp/ope-ful promise of health, and effectively, therefore, achieving the biomedical and political goals of reconciliation.

Fielding Bioethics in Canada

As research priorities in biological sciences continue to shift toward genomic analysis, so too are approaches to ethical research practice and the regulatory bodies that administer them. Bioethics, as it is called, is a field that considers new research contexts related to the study of DNA. In Part 1, we learned that genomic research is being increasingly funded by governments. Funding for genomic research is also being extended to the social sciences and humanities in order to consider its ethical dimensions and implications; and identify ways to mitigate risk and harm in research. In the Canadian context, bioethics is the language used commonly to talk about genetics/genomics and its ethical, environmental, economic, legal, and social implications (GE3LS). Whereas, in the United States, rapid expansion in the genomics sector has been accompanied by consideration of its ethical, legal, and social implications (ELSI). These acronyms serve to capture and reorder the expansive historical (e.g. colonial and imperial) relations through which biomedical research, institutionalized health care systems, and the

sovereignty of nation-states that link their possessive claims into a form that is more manageable to research funding agencies (i.e. policy for science). Indeed, predominantly non-Indigenous researchers and research institutions continue to control the very ethical principles, protocols, and policies that regulate genomic studies of Indigenous peoples. Reorienting ethical frameworks in the field so that they are driven by Indigenous peoples' knowledge, experiences, and stakes in research will be paramount for addressing the colonial nature of biomedical research.

Indigenous peoples' resistance to exogenous research conducted about them has had profound effects on bioethical research praxis in a number of scientific fields, including biomedicine.[34] For Indigenous peoples, risk associated with genomic research is high and includes compromising their ability to be self-determining nations and to develop individual and collective identities and life-ways based in Indigenous conceptions of life, kinship, land, and relationality. On this front, Indigenous peoples have come to understand genomic research within the context of political self-determination (Harry, 2005); and have developed policies and practices to guide research that is about and affecting them. Indigenous peoples' insistence on governing research is part of a long defense against colonialism.

Just as Indigenous peoples have never had the luxury of thinking about science and politics separately, neither do they think of bioethics and colonialism separately. Bioethics operates as the primary field that research institutions use to regulate the wide-ranging power

---

[34] As discussed in Chapter 1, in the 1960s and 1970s and in conjunction with Indigenous sovereignty movements, Indigenous scholars who shaped much of the intellectual foundation of what has become the discipline of Indigenous Studies, prioritized an endogenous Indigenous project of studying their own cultures, languages, histories, bodies, and politics. Previously, research about Indigenous peoples had been dominated in the academic field by exogenous research conducted by non-Indigenous people (Moreton-Robinson, 2016, p. 6). Struggle over who ought to represent Indigenous peoples within the productive capacities of scholarship has been tied to Indigenous peoples' assertions of their inherent right to be self-determining.

dynamics involved with doing biomedical research with Indigenous peoples and about indigeneity. I argue that since bioethics, as a field and a set of institutional frameworks, have accompanied biotechnological advances, they also require examination *as* a technology of power and, especially, because they act as a methodological device that enables genomic research and shapes the production of genomic knowledge. Put more simply, the exploitation in the history of biomedical research has begotten the field of bioethics, which as an institutionally permissive framework, now begets more biomedical research. The analysis of what constitutes ethical research with Indigenous peoples and about indigeneity in this chapter, therefore, exceeds the frame of GE3LS or ELSI or, even, bioethics more broadly positing, instead, that the scientific field's circuitry of colonial relations conditions (rather than mitigates) the possibilities of would-be research implications. These relations realize, that is, they make colonial implications real. In studying the relationship between biomedical inquiry and bioethics, I am not categorically concerned with establishing the value of biomedical research as being, for example, good or bad, but rather with determining the limitations of the field of bioethics to regulate the coloniality of knowledge production in, especially, genomic research concerning indigeneity.

As discussed in Part 1, scientific fields around the world underwent an epistemological overhaul after the 1930s. The shift from a race- to a population-based understanding of human variation in biomedical research has been transformative of the field, but it has not been without conflict. The past thirty years, especially, have been shaped by cases in which colonial relations have structured genomic research. In Canada, the issue of coloniality and DNA-based biomedical research came to light after Dr. Ryk Ward of the University of British Columbia engaged in research among the Nuu-chah-nulth Nation of the Pacific Northwest coast. In the early 1980's Ward approached Nuu-chah-nulth leaders. He wanted to study the human leukocyte antigen

(HLA) alleles that he believed contributed to high rates of arthritis among members of the nation (McInnes, 2011). Over 800 Nuu-chah-nulth individuals provided Ward with blood samples for his study. Ward's research, which ended abruptly, failed to demonstrate the linkage that he had originally hypothesized (Wiwchar, 2000). Nevertheless, even as the study was over, his use of the samples was not. Ward moved the Nuu-chah-nulth blood to numerous academic institutions and shared them with other researchers – all without Nuu-chah-nulth permission (2000). The samples were subsequently used to produce hundreds of academic papers about contentious topics like the alleged genetic and geographic origins and migrations of the Nuu-chah-nulth Nation and ancestors (2000). The nation did not have their samples returned to them for another 20 years without any insight into the high rates of arthritis that its communities continued to experience. Ward went on in 1996 to take up the distinguished position of Professor of Biological Anthropology at the University of Oxford.[35]

In their refusal to be reduced to objects of scientific curiosity, Indigenous peoples have, more than any other, "reshaped the terrain of genetics research and bioethics" (Munsterhjelm, 2014, p. 49; see also Barker, 2002; Fixico, 1996; Whitt, 1995; Harry, 1993; Wilmer, 1993). Through their active resistance against extractive and exploitative studies, Indigenous peoples have contributed to creating regulatory research frameworks. The Nuu-chah-nuulth case is no different. Ward's actions and Indigenous peoples' responses to them would contribute to influencing the Canadian Institute of Health Research's (CIHR) creation of the Guidelines for Health Research Involving Aboriginal People (Boyer et al., 2011; Arbour & Cook, 2006). Two

[35] For more on this case see, Bolnick, A. B., Raff, J. A., Springs, L. C., Reynolds, A. W., & Miró-Herrans, A. T. (2016); TallBear (2013); Kowal, E., Pearson, G., Peacock, C. S., Jamieson, S. E., & Blackwell, J. M. (2012); Arbour and Cook, 2006; Dalton, R. (2002); Ward. R. H., Frazier, B. L., Dew-Jager, K., and Paabo, S. (1991).

workshops were held in British Columbia in August 2001 and then January 2002, and funded by the CIHR and the Institute of Aboriginal Peoples Health. These workshops marked the bioethical turn in Canada.

Out of the workshops local, national, and international input from Indigenous peoples led to creating the principle of "DNA on loan" (Arbour & Cook, 2006). The principle, which would go on to shape the Guideline, asserts that no researcher ever owns samples given to them by Indigenous research participants. Rather, samples are to be seen as gifted loans to the researcher and thus require their ongoing regulation by the giver (Arbour & Cook, 2006). The *Guideline* was in effect from 2007 to 2010 when it was replaced by Chapter 9 of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans. The Policy also emphasizes that researchers do not own the Indigenous samples that they might be studying and are thus bound by the terms of use agreed upon between the researched and researcher. Chapter 9 highlights the need for obtaining individual, and also, collective informed consent when doing research with Indigenous peoples. The CIHR Guideline and Policy were subsequently joined among the bioethical field in Canada by the Ownership, Control, Access, and Possession (OCAP®) principles for research trademarked by the First Nations Information Governance Centre. OCAP prioritizes Indigenous governance in research so that it is designed by and for the interests of Indigenous peoples. Taken together, these frameworks have institutionalized "a new set of practices for Indigenous health research" (Morton Ninomiya & Pollock, 2017, p. 29; see also Boffa, King, McMullin, & Long, 2011; Maar et al., 2011; Schnarch, 2004).

While Indigenous peoples' influence on informing the bioethical turn in Canada is often left behind the curtain of institutional studies (Nelson, 2016), international scholarship has framed Canada's bioethical Policy as a best-practice model (TallBear, 2013; Taniguchi, Taualii,

and Maddock, 2012). Others, however, have pointed to the limitations of the policy with attention paid to the enforceability of ethics requirements. Morton Ninomiya and Pollock (2017) notice, for instance, that there is "no mechanism to consistently enforce or hold researchers and their institutions accountable to Indigenous communities" (p. 32). Additionally, I propose that the protections offered by the CIHR Guideline and Policy, as necessary as they are given the empirical contexts out of which they came into being, very often lead to a contractual relationship of accountability that relies on protocols to produce ethically derived knowledge: get band approval, check; submit application to university ethics review board, check; have consent forms signed, check; etc. In turn, the racialized/ing-gendered/ing epistemologies that continue to shape the kinds of biomedical research questions that are asked and the methodologies used to answer them, as explored in Part 1, remain distilled from the regulatory process.

To remind you, McCallum and Perry (2018) have explained that, for indigeneity, the relationship between race and disease has meant that among the health care system, Indigenous individuals are perceived as representing an Indigenous population and racist representations of the group tend to stand in for perceptions of the individual. The same logic, however softened by the referent of population rather than race in 21st century public health discourse, continues to be operationalized. No longer is health/disease expressed in terms racial superiority and inferiority, but through ethical biomedical research that seeks to reconcile the health status of Indigenous peoples with that of the rest of the society. When the political relations of genomic research are framed as a question of ethical procedure, rather than as a problem of colonialism, consent is imbued with the ability to settle the historical set of colonial relations that have shaped the questions being pursued by biomedical researchers. Indigenous consent to engage in genomics

research is the *carte blanche* for the flourishing of patriarchal-white possession at the core of these fields.

As explored in Part 1, the pathologizing of Indigenous peoples through racial and genetic knowledge of inheritance and immunological susceptibility implies that the white body is the optimal standard to be measured against in regard to acceptable rates of tuberculosis morbidity. I will now analyze how practices of consent protected by bioethical policy also implicitly prescribe an ideal subjectivity that is equally disciplined into and as whiteness. Bioethical frameworks prescribe the practices and relationships that are deemed ethical in research, and in this configuration, they produce the type of subject that is able and required to engage in them. I am not investigating the values of particular ethical guidelines per se, but rather, critically analyzing the unspoken value placed on a kind of research subjectivity: the self-possessing subject that is produced through contemporary protocols of bioethics, a subjectivity which reinforces the maintenance of a racializ/ed/ing-gendered/ing indigeneity through a politics of re/iteration.

Reconciling Consent

The politics of reconciliation have become a focal point of critique among Indigenous political theorizing for, especially, the ways that they remain invested in bringing colonial settlement to completion (Coulthard, 2014, 2010). In particular, there is concern that the liberal multicultural integrity of reconciliation signifies and limits Indigenous nationhood within the bind of the politics of identity/difference recognition (see for instance, Kymlicka, 1995). Critical scholars have demonstrated how liberal productions of Indigeneity have contributed to the dispossession of Indigenous peoples from their lands and sovereignties (see also, Palmater, 2011; Andersen, 2010; Coulthard, 2010; Alfred 2009).

When political relationships between Indigenous peoples and Canada are ones defined by reconciliation, morality becomes a register for good relating. In liberal democracies with morality at the helm of politics, the contract is used to mitigate risk between agents that are, in Hobbesian conjecture, inherently self-interested and in need of contractual governance. Audra Simpson (2008) contends that the legitimacy of liberal democracies like Canada and the US hinges on rhetoric of the social contract and the implied consent of citizens to be governed for their own good. As noted, Fanon (1965) points to the constitutive element played by medical institutionalism in colonialism, and he is further instructive here. Fanon, wrote of the role that "experimentation on living patients," (p. 124) played in the colonial context of Algeria. Regarding its efficacy, he wrote about the implicit consent required by research subjects and patients which acknowledges the medical superiority and progress of the colonizer:

> "Reduced in the name of truth and reason, to saying "yes" to certain innovations of the occupier, the colonized perceived that he thus became the prisoner of the entire system, and that the French medical service in Algeria could not be separated from French colonialism in Algeria" (Fanon, 1965, p. 122-123).

Consent, whether given implicitly or explicitly, he suggests, remains structured by colonial imprisonment. In this way, the colonial power relation is not negated through bioethical protocols like the obtaining of consent, but rather operates in ways that condition the possibility, nay, the necessity of consent. Furthermore, because Indigenous peoples' have endured objectifying and violent experiences in research, colonial power relations have coercively directed Indigenous peoples into the contract culture as a way to reduce the risk of colonial self-interest. As a result, and through ethical biomedical research, Indigenous peoples are being disciplined into a subjectivity that is structured by and acts to further structure the broader

project of political reconciliation. The role that bodies, individual and institutional, play in producing practices of reconciliation are obscured through consent.

Indigenous experiences with and resistance to colonial research have underwritten bioethics more broadly in Canada (and in other colonial countries) by requiring not simply individual consent, but also collective consent bestowed by community leadership (in Canada, often by band chief and council) (Boffa, King, McMullin, & Long, 2011: 737; Quigley, 2006; Ruttan, 2004; Piquemal, 2001). I am concerned with discussing a third level of consent, *the consent to be represented*, which, I argue, unlike individual and collective consent, cannot be reconciled through current bioethical protocols. Butz (2008) identifies consent to be represented as including the "ramifications of [a] representation [which] extend far beyond the individual participant" (2p. 45; see also Boffa, King, McMullin, & Long, 2011). Given that health research about bodies deemed Indians has been structured by and structurally implicated in racialized/ing-gendered/ing biomedical institutionalism in Canada, research about Indigenous peoples comes to conceptually re/iterate indigeneity. The epistemological limit of a bioethical approach is at least evidenced by its inability to address the colonial politics of re/iteration at the core of biomedical research related to, for example, tuberculosis.

Because colonial relationships reorder Indigenous peoplehoods through the production of indigeneity (in its various iterations), knowledge about one people often stands in to represent indigeneity broadly conceived. This was evident in the movement of the Larcombe study into the Tuberculosis Standards (discussed in Part 1) even as, by all accounts, the study was ethical, especially in terms of it being consented to individually and collectively. Partial, rather than definitive results regarding small sample sizes of Cree and Dene cohorts were generalized in the Tuberculosis Standards as evidencing possible "genetic factors" (2014, p. 345) for Indigenous

peoples' susceptibility to TB. Contracting into research via consent, then, requires individuals and communities to, in a pseudo-Rawlsian fashion, check one's standpoint at the door and to become a research subject as if they are not produced as Indigenous, according to various iterations and logics, and as if knowledge about them as Indigenous will not impact representations of indigeneity that will, in turn, affect other Indigenous peoples. Relations of coloniality negate the possibility of free and informed consent insofar as racialized/ing-gendered/ing re/iterations act to structure their possibility.

Indigenous Refusal to Consent and Scientific Fragility

Wendy Brown (2010) describes the precariousness of nation-state sovereignty insofar as it is being, in late modernity, colonized by the forces of neoliberalism and religious war. While Brown's *Walled States, Waning Sovereignty* is instructive for understanding the external forces disturbing nation-state sovereignty and its protectionist measures, it is less helpful for understanding the effect of internal threats to sovereignty and the ways that nation-states react to them.[36] Pointing to the fundamental fragility of colonial nation-state sovereignty, Audra Simpson (2008) foresaw this theoretical space. Simpson (2014, 2008) argues that Mohawk and other Indigenous refusals to consent to the geopolitical monopoly and governance of and by colonial nation-states destabilizes the legitimacy of their claims to sovereignty. As a

---

[36] The management of internal enemies has been fundamental to establishing Anglo-First World nation-states. For example, Horsman (1986) writes of what would become the United States of America: "Between 1815 and the mid-1850s an American Anglo-Saxon ideology was used internally to bolster the power and protect the status of the existing population and externally to justify American territorial and economic expansion. Internally it was made quite clear that the American republic was a white Anglo-Saxon republic; other white races would be absorbed within the existing racial mass while nonwhite races would be rigorously excluded from any equal participation as citizens" (p. 189).

result, she explains that sovereignty, when built upon Indigenous dispossession, is essentially fragile: a false bottom or edifice without structural integrity (if you will), and that Indigenous refusal to recognize its legitimacy is a reminder of its fragility. Fanon also speaks of refusals in colonial contexts and, in particular, of Indigenous refusals related to medical institutionalism:

> The colonized who resisted hospitalization did not do so on the basis of the fear of cities, the fear of distance, of no longer being protected by the family, the fear that people would say that the patient had been sent to the hospital to die, that the family had rid itself of a burden. The colonized not only refused to send the patient to the hospital, but he refused to send him to the hospital of the whites, of strangers, of the conqueror. (p. 125)

Refusal is an enduring political tactic of Indigenous resistance and resurgence that has emerged also in academia as a methodological strategy to disrupt colonial relations of knowledge production.[37] Part of the work in this dissertation is not only to think through the sort of intellectual and institutional project that I am engaged in and how I go about doing it, but also, it involves making sense of "the what happens" in the wake of this "doing." In many cases, when critical Indigenous analysis and epistemological refusal is directed at authoritative fields of sovereignty, and as I will explore, of science, Indigenous people are a reminder of the shaky grounds upon which non-Indigenous people exist and can, therefore, be met with peculiar and often, hostile reactions. The politics of fragility that unfold *in the wake of refusal* has the potential to, I argue, break open deep anxieties that lay at the colonial scientific core.

Robin DiAngelo (2011) has famously written about fragility in the context of whiteness. DiAngelo describes it as a set of feelings and actions socialized through structural privilege that

[37] Simpson (2014) and TallBear (2013) engage in ethnographic refusal by refusing to make their own Indigenous peoples the subject of their critical inquiry.

seek to restore the racialized equilibrium of inequity upon what are perceived to be racial triggers. On one hand, white fragility includes feelings of discomfort in talking about race and white race privilege, and on the other, it includes a set of dispositions and practices that seek to restore the im/balance of race relations and protect the unearned privileges of historically, socially, politically, and culturally produced whiteness. While DiAngelo's (2011) "white fragility" has offered a generative conceptual tool to make sense of race relations and guide anti-racist education, it fails to position the structural constitution of whiteness with Indigenous dispossession. For DiAngelo, those socialized into and as whiteness have not developed the stamina or resilience required to cope with racial stress. But further, nor are they equipped to deal with the ontological disturbance caused when their naturalized emplacement within the homes that they have made of other peoples' homelands is questioned. Drawing on these theories of whiteness and colonial affect, I put forward the concept of *scientific fragility*. My intention is to confront the feelings of "being attacked" among scientists who are triggered when Indigenous refusal to be represented (described above) is directed at biomedical knowledge. I will describe two sets of relations and then discuss what they can reveal about the coloniality of scientific fragility.

Relations of Fragility #1:

In the summer of 2012 just months before the mobilizing of #idlenomore, another movement, called the *Death of Evidence* was being organized across Canada. Led by biologist Katie Gibbs, scientists mobilized in protest of federal policies rolled out under the leadership of then Prime Minister Stephen Harper. Thousands of scientists came together in Ottawa, Ontario to express concern over what they believed was the waning role of scientific knowledge in the political governance of the country. Accounts of the muzzling of government scientists

and the removal of long-standing environmental protections by the Conservative Government triggered scientists from different sectors to assemble in defense of their own vocation and for the role of scientific evidence in government decision-making.

Out of the *Death of Evidence* rallies, a not-for-profit organization, Evidence for Democracy, emerged to "champion science and smart decision-making in Canada" (Evidence for Democracy [E4D], 2013). Since its mobilization, there has been a comprehensive review of the state of science in Canada, the Naylor Report; unprecedented increases in spending on research funding; and the reinstatement of a federal Chief Science Advisor. Additionally, the Government of Canada invested $2.5 billion in the 2018 budget to overhaul Canada's scientific infrastructure and is currently undergoing consultation to name and brand the "new, cross-government initiative that aims to build a stronger, more collaborative federal science and technology ecosystem" (A. Thompson, personal communication, December 6, 2018). The role of scientific knowledge production in policy-making is back on the rise in Canada and it joins a transnational network, including the US-initiated, *March for Science* that is calling for the resurgence of the role of scientific reason and facts in a time of post-truth political governance.

Relations of Fragility #2:

In September 2017, I was presenting research at a history of medicine conference, *The Manitoba-Northern Ontario-Minnesota-Saskatchewan (MOMS) History of Medicine 6th Bi-Annual Conference* in my ancestral homeland of Treaty 1 territory in Winnipeg, Manitoba. My presentation argued that among biomedical research related to Indigenous peoples and tuberculosis, procedural improvements in research ethics policy (discussed in this chapter) do not necessarily transform the colonial dynamics of a given research project. I explained that for biomedical research and bioethical procedures to address colonial relations in the production of

knowledge, critical analysis of the racialized/ing-gendered/ing re/iterations of indigeneity in the corpus of biomedical knowledge related to Indigenous peoples (the taken-for granted assumptions that continue to guide questions around, for example, susceptibility to infectious disease) would be required. Without such critical inquiry, biomedical presumptions would continue to render the politics of indigeneity and the relations of power that produce it as being commonsensical, not scientific.

To substantiate my argument, I presented the findings of my comparison discussed in Part 1 of this chapter between the in/famous 1928 study of tuberculosis among Indians and the 2008 genetic study of tuberculosis among Dene and Cree cohorts. I argued, as I did in Part 1, that, the 2008 study adheres to advances in bioethical policy in Canada making it, on all accounts, an ethical one, but that its discursive design is impacted by an older racialized/ing-gendered/ing logic that pathologizes the Indigenous body rather than the colonial conditions that allow TB to thrive among some communities. At the heart of my paper was a refusal to be represented by the body of biomedical knowledge that has come to see indigeneity in terms of pathological heredity: I do not consent to Larcombe et al.'s (2008) representation of indigeneity as being historically and immunologically fragile and I do not consent to the Tuberculosis Standards' (2014) representation of indigeneity as being genetically susceptible to tuberculosis.

The Principle Investigator of the study, Dr. Linda Larcombe was in the audience. I knew she was present. Prior to my presentation, I privately asked her whether she would like to be acknowledged as being present. She declined, and so it caused quite a stir during question period when she raised her hand and proclaimed: "I am Linda Larcombe." After the room's collective gasp quieted, we had a collegial discussion in which Dr. Larcombe helpfully elaborated on the

unpublished context surrounding the study. Following the presentation, she suggested that we, along with Dr. Kim TallBear, work together in the future.

I was surprised a week and a half later when I received a formal letter from Dr. Larcombe and two other scientists, Dr. Pamela Orr and Dr. Peter Nickerson, from the University of Manitoba who had not been at the presentation. The letter stated that they would like to "set the record straight." They assured me that they have "never made any judgment regarding the superiority or inferiority of the genetic makeup of any person or group." They declared that I "misunderst[ood] the nature and content of [their] research," and of "genetic sciences," more generally; and that through my miscomprehension and mischaracterization, they were "chagrined" that I left the conference audience with a "negative view of [their] work." Further, they instructed that, in the future, they will "respond appropriately" to "distortion, calumny, slander, and/or libel" related to them personally or to their work (L. Larcombe, P. Orr, & P. Nickerson, personal communication, September 28, 2017). Copies of the letter were sent to the President and Vice President of Research at each of our universities (including the University of Manitoba and the University of Alberta where I was employed), the Dean of Medicine at the University of Manitoba, and the Chief and former Chief of a First Nation that was in the original study.

Scientific Fragility Explained

On being accused of psychiatricide, Michel Foucault remarked in an interview with Rux Martin in 1982: "You know the difference between a real science and a pseudoscience? A real science recognizes and accepts its own history without feeling attacked" (Martin, Gutman, & Hutton, 1988, p. 11-12). Usually, I am not keen to distinguish between real and false sciences. Doing so implies that (as noted), one; there is a unity rather than contingency in the

intent and practice of a real science, and two; that a value-free way of doing science actually exists through proper method. However, I think that when Foucault remarked that "[a] real science recognizes and accepts its own history without feeling attacked," he was being ironic and questioning the internal inconsistency, the fundamental aporia of the scientific paradigm as it gets imagined as an unbiased discovery of reality. Both of the empirical sets of relations that I described above indicate a "feeling attacked" - a sense that one exists among fragile relations. In the first example, a scientific community coalesced to protest pro-industry federal policies backed by sovereign authority that were seen as an attack on the country's national science programme. In the second, three tenured Professors were triggered by a graduate student's 15-minute presentation at an obscure medical history conference. It is intriguing that despite the relative position of power generated by the scientific field among the broader epistemic field (meaning that among knowledges, that which is deemed scientific is generally perceived as more valid than others) these scientists would feel triggered.

If the scientific field *is* a critical pipeline in the colonial possession of territories and bodies then a move in defense of scientific supremacy among forms and institutions of knowledge production is also a move ontologically rooted in patriarchal-white sovereignty. Scientific fragility represents a particular form of self-protectionism through, and in the service of scientific authority and knowledge - itself the product of colonial dis/possession. Scientific fragility demarcates the political stakes of scientific knowledge in governance. This is well-defined in the first set of fragile relations which indicates obviously that even though the scientific field is shaped by competition between individual scientists, institutions, and fields (for things like funding, intellectual capital, recognition, and awards), it is also structurally

collectivized through a shared interest in the continuity and legitimacy of using scientific knowledge to inform government-decision-making. As such, the scientific field is a shifting set of relations, like a breathing organism, that expands through individual interest/competition and contracts through collective protectionism as it relates to the scientific field's relative position among the broader field of colonial governance. The scientific field is not simply an arm of the nation-state, in effect, but rather struggles, at times, in tension with it.

The second set of fragile relations evidences a scientific fragility that results from the perception that Indigenous critique is anti-scientific and thus targeted *against* scientists, rather than as productive intellectual engagement *with* scientific ideas. My own critical engagement with genomic scientists, policies, and knowledge is, however, far from being, to quote TallBear (2014), a "critique for critique's sake" (p. 3). Rather, I care about what happens among science and science policy fields especially where I see their potential to reconfigure colonial power dynamics. The unwillingness to productively engage with Indigenous critique, particularly when such unwillingness is expressed through exaggerated defensiveness and inflated self-preservation, is equivalent to an assault on Indigenous knowledge production and embodied sovereignty. As such, the reactions effected through scientific fragility stand in defense of locating patriarchal-whiteness as the epicenter of the possession of valued thought/being.

The paradox of scientific fragility is that, "[w]hat appears at first blush as the articulation of [scientific authority]…actually expresses its diminution relative to other kinds of global forces – the waning relevance and cohesiveness of the form" (Brown, 2010, p. 24). Within relations of fragility, where shifts in global and local politics are reconfiguring systems of governance and control, there is a crack in the colonial foundation where a growing tension between nation-state sovereignty and transnational scientific mobilization exists. It marks an opportunity, I

believe, where Indigenous peoples might maneuver into and through the vacuum created by colonial in-fighting and shift its vulnerable equilibrium toward pathways of Indigenous empowerment. The search for ways to do that is, I believe, the work of an emerging network: Indigenous Science, Technology, and Society (Indigenous STS).

Chapter 5

Miskâsowin: Indigenous Science, Technology, and Society

I have generated theoretical relations about *what genomic knowledge means for indigeneity* in Canada and, also, *what Indigenous knowledge can mean for genomic science*s and policies. I have critically analyzed ways that the biological matter of Indigenous peoples' bodies is being collected and their DNA sequenced for purposes of biological anthropology (i.e. ancient human migration/population genetics), bioeconomic consumption and accumulation (i.e. direct-to-consumer genetic ancestry testing, access to extraction/land), biomedical research (i.e. immunological susceptibilities), and science policy (i.e. missing-persons recovery efforts). Each chapter has mapped clusters of relations that conjure transvalued re/iterations of indigeneity; themselves produced and productive of 21st century technoscientific contexts where advances in biotechnology are intensively drawing academic, industry, and government attention toward bio-based governance, consumption, and profit.

In my movement across, within, and between a multiplicity of disciplines and sectors, all of which have a stake in (being productive of) biotechnological relations of indigeneity, I left traces where I went. This looping method means that the dissertation can be read forward or backward, it matters not. Each direction arrives at the same place, yet the center is not static. Can you find it? To help you, I have pulled threads from different disciplinary literatures, policies, and institutional relationships in order to map a heuristic field of genomic indigeneities. This mapping was necessary since I was required to traverse the prescribed, yet porous boundaries of disciplinary knowledge. The whole body (the dissertation) is situated within the anti-disciplinary home of Indigenous Science, Technology, and Society (Indigenous STS). I have come to understand that concepts are fields of struggle in and of themselves. There is no conceptual

certitude and realities evade the concepts which are tasked with describing them. And, when one is not restricted to the boundedness of modern disciplinary divisions, they are also no longer bound to the conceptual purities of modern epistemological divisions (and vice versa). With this in mind, and through a critical Cree/Ininiw way of relating, I have engaged three sets of conceptual relations mapped by three relational thinkers: Michel Foucault (relations of bodies and technologies); Pierre Bourdieu (relations of science and politics); and Aileen Moreton-Robinson (relations of patriarchal-white sovereignty and possessiveness). Rather than putting them into argumentative conversation with each other, I have looked for ways that these respective relational analytics are complementary: where they resonate.

The work of mapping relations – of making this body – has meant that I have effectively fixed them in time/place amidst the parallel backdrop of ongoing movement among genomic fields and the contingencies of coloniality from which they have derived. While, to me, this knowledge, therefore, became obsolete the moment that I wrote it as being real, my task has been about more than a scripted analysis. Yet, ideas uttered have energy. They generate force. They are alive and they have their own energy and productive capacities. This is likely not quite what Foucault had in mind when he gave birth to "discourse," but nevertheless the animacy of knowledge creates and destroys, obscures and proliferates, captures and releases. Knowledge manifests and reorders sets of relations.

Evading my reflexive awareness throughout much of the research process, I have nevertheless been navigating my way through a set of methodological relations capable of guiding *how* a critical Ininiw theory of genomic indigeneities could be done. On this front, this chapter is a methodological contribution that is uniquely adapted to my relationships with genomic knowledge and indigeneity; with the scientific and policy fields in Canada (and

beyond); and with my own research integrity. The creation of Indigenous approaches to analyses of the sciences and technologies that affect Indigenous and non-Indigenous peoples is disruptive to colonial ontologies of knowledge and sovereignty. This chapter (and maybe also this thing in its entirety) is deliberately iconoclastic.

Miskâsowin, my methodological relations, have been produced alongside of the labour that I have contributed to the rise of Indigenous Science, Technology, and Society (Indigenous STS). This is a burgeoning anti-disciplinary field that examines how Indigenous peoples' engagement with science and technology fields, when done in and on their own terms, can support their communities and territories. In the course of my research, I have worked with Dr. Kim TallBear in the Faculty of Native Studies at the University of Alberta (U of A) to develop the Indigenous STS Research and Training Program (also Indigenous STS), and its adjunct, the Indigenous STS Network.

Indigenous STS, as we are calling it, is an emergent subfield (of Indigenous Studies) that explores the relationships between science and technology fields, the environment, and human and non-human relationships by taking for granted that they are constitutively muddled with colonial politics and Indigenous knowledges.[38] Indigenous STS builds capacities of mostly non-Indigenous institutions (academic, industry, and government) through, and in support of, Indigenous expertise, scientific and otherwise. It is engaged in building the capacities of

[38] Dr. Kim TallBear is a recognized leading scholar in the fields of Indigenous Studies and Science and Technology Studies. She was recruited through a Canada Research Chair to UAlberta to build this area of research in the Faculty of Native Studies. In 2016, I was subsequently recruited by the Faculty of Native Studies as a pre-doctoral fellow and then as faculty member to join Dr. TallBear in building the research area. It is from this institutional process that Indigenous STS (as we are calling it) is materializing at the University of Alberta.

scientific fields so that they are capable of producing and backing highly interdisciplinary, relational, and Indigenous research and training approaches.

Indigenous STS is also an international network of students, scholars, practitioners, and community members that supports research and training for Indigenous peoples in the technosciences that affect them. From "Indigenous-embodied knowledge" (Moreton-Robinson, 2016, p. 4), Indigenous STS asks questions like: how do the logics of nature, exploration, and discovery, and the scientific and political technologies that they bring to bear impact bodies, peoples, relationships, relatives, and spaces? How have political and scientific philosophies of humanness, morality, legal personhood, and citizenship come at the expense of Indigenous peoplehoods? And further, how can we disturb assertions of assumed geopolitical possession to territory and the exceptionalism of academic freedom to reconfigure balanced relationships with each other and with the rest of creation? In asking questions like these, Indigenous STS is not anti-scientific, but rather, considers how engagement *with* technoscientific fields by Indigenous peoples and from multifaceted and dynamic approaches might support Indigenous ways of relating in and with localities of creation.

Indigenous STS works to secure non-disciplinary answers to these and other questions by building and working through interdisciplinary and inter-knowledge (academic and not) relationships. Therefore, the work of Indigenous STS seeks to break down the bounded knowledges of disciplinary reason and map the networked interrelations of problems inhibiting, and solutions strengthening the empowerment of Indigenous peoplehoods. Because of its unapologetic disavowal of conceptual purities and, thus, its methodological iconoclasm, Indigenous STS offers the transformative critique capable of propelling knowledge creation away from the imposing goodness of normativity. As an Indigenous STS theorist (among other

stuff) I approach every question knowing that I, alone, do not have enough knowledge required to answer it. This approach makes for better questions.

As I present it in this chapter, Indigenous STS is analytically productive and can be used to formulate Indigenous methodologies related to the study of science and technology fields. By generating methodological relations that are uniquely adapted to Indigenous researchers' relationships with technoscientific knowledge and fields, Indigenous STS dislocates historical patterns that would otherwise continue to limit Indigenous peoples as being subject to, rather than creators of knowledge. For many Indigenous peoples, engagement with scientific fields and knowledge is not a project devoted to reconciliatory politics that seek to include them without disturbing the territorial, political, and morally inflected claims of nation-states, researchers, and institutions to possess their territories and to study their bodies while controlling the bioethical principles, protocols, and policies for doing so. Rather, we are peoples with distinct and shared territories; governance systems; and a *sui generis* relationship with the nation-states and their citizens that continue to be at home in our homelands. Indigenous STS reorders the racialized/ing-gendered/ing epistemologies that loom across time-spaces of coloniality and that would continue to maintain patriarchal white sovereignty and dis/possession through re/iterations of indigeneity.

Miskâsowin: Feeling Power

As an approach to doing research, I do not see Indigenous STS as a normative theoretical framework even as I outline its theoretical trajectory above. I hope it will never be such. Becoming so would be tantamount to abstracting knowledge/power politics out of human action (and the productive capacities beyond human action) from the realities that they shape. Indigenous STS is not an imperial project of normativity. Its practitioners creatively find/make

space to navigate the current relations that do not empower Indigenous peoplehoods. They often refuse to allow current ways that knowledge production is organized to shape the identification of research problems, questions, and solutions. As such, and as an Indigenous STS'er, I work toward non-disciplinarity through interdisciplinary collaborations. Indigenous STS involves forging new methodological relations.

I call my set of Indigenous STS relations, Miskâsowin. It is a Cree word that means to remember one's core (Cardinal and Hildebrandt, 2000; Kovach, 2009). I have come to understand miskâsowin in relation to the seven directions. There are the four cardinal ones, North, East, South, and West; there is up toward the sky; and down toward the earth. The seventh direction is inward: inward to our core, which connects us to the other directions - to misewa (all that exists) the rest of creation. Accordingly, there is a presumption here that everything is, by definition, connected to something else. The *a priori* that relationality underscores becomes not just claiming the relativity of all things as being related, but to situate relations as sites of production, power, and critical analysis (this is where Foucault, Bourdieu, and Moreton-Robinson resonate). Miskâsowin is infinite action. It is in the remember*ing*, the do*ing*, the ongoing movement, not in the end point to where one connects. Miskâsowin is far from an *add methodology to a given question and stir*, but, rather, requires connecting with how one's body is relationally generative with what they know and how they (can) impact realities. Its disposition points not only to the ways that categories of analysis (race, sex, gender, class, etc.) intersect in practice and produce experience (e.g. Dhamoonian intersectional-type analysis) or how they might be performed as identities of difference (e.g. Butlerian politics of performance), but rather, to train the body/to remember how to think relationally, to know relationally, to speak relationally: *to be in relation*.

In Cardinal and Hildebrandt (2000), Iyiniwak elders draw what seems obvious to them - a consequential link between the ways that indigeneity gets racially stereotyped (interpersonally and through nation-state policies) and the material conditions faced by Indigenous peoples. The grandmothers, in particular, "pointed to the number of First Nations peoples who are in jails, the number who have become dependent upon alcohol and drugs, the number who are increasingly found in the streets, the rising number of suicides, and the many other ways in which First Nations communities continue to be traumatized" (Cardinal and Hildebrandt, 2000, p. 22). They maintain that the internalization of these realities is, in part, due to the "mythologies" (p. 22) that depict "First Nations as the original immigrants to the Americas" (22). They go on, "In part, these mythologies were created to justify the taking of First Nations' lands by Europeans. They also are intended to diminish and weaken the First Nations' sense of origin and belonging to "the Peoples' Island"" (p. 22). Not through the conceptual language of dispossession, but something closer to *dis/tort/orienta/tion*, these elders identify the connection between the exogenous stories told about indigeneity and their effects on bodies, including the degree to which they undermine their very being. The elders point to miskâsowin as a way for Indigenous peoples to re/orient and empower themselves in relations.[39]

Like the project of deconstruction advanced by Critical Indigenous Studies scholars and other critical theorists, miskâsowin involves breaking down the harmful knowledge and the attachments Indigenous peoples have to the stories that frame them as not belonging in their homelands and as always somehow constitutionally lacking. The process gestured to by the grandmothers - of becoming aware of how indigeneity has been scripted and in turn empowering

[39] I would like to thank Aaron Mills who first brought this book to my attention.

ourselves - resonates with me. Denaturalizing taken-for-granted logics shaping indigeneity (in language and body) guides my claim that the work of Indigenous STS necessarily includes critique of the interactive production in colonial spaces of scientific, political, and material orders. But further to critique, Indigenous STS must also consider how the use and development of technosciences on Indigenous peoples' own terms might support our ways of relating. The Indigenous STS idiom holds these two projects together reflexively – productive critique – given that technosciences simultaneously pose potential risks and promises for Indigenous peoplehoods (which include relations with the earth and universe).

In making this thing that you now read my centre has shifted many times and I have had to remember myself many times over as a result. Remembering myself at a given time-space allows me to understand how I come to know in my research. My body has not been untouched by this process. It has suffered and travelled, desired and been pleasured; it has been in pain and felt relief, expanded and hardened. My body is forever changed and, in a beautiful way, it will now be able to produce through new and unknown relations.

The anecdotal vignettes spotted throughout the chapters offer observations and reflections from the cockpit of miskâsowin. This writing style is a way of inserting an added layer of analysis concerning the scientific field: the relations (intellectual and institutional) that I traversed while conducting the research: a meta-analysis of sorts. It is intended to invoke a self-consciousness routed in knowing that while I study 'this' or 'that,' I am not standing from a distance of observation or even of participation. I am, rather, *invested* in that which I am engaging and affecting. Through miskâwowin, I have gloriously failed to contort into and as a political theorist, just as I am no longer especially an Indigenous Studies scholar. Rather, I am power.

Body Beautiful: Being Power

Critical Indigenous methodologies are said to consist of the researcher's standpoint, methods, and a critical Indigenous theoretical framework (Walter and Andersen, 2013). Moreton-Robinson (2015) similarly explains that research done by Indigenous scholars should be about operationalizing our "Indigenous-embodied knowledge" (p. 4) (including *all* of the knowledges and methodological tools that might be helpful to us) in order to "develop and define our intellectual projects, theories, and methodologies" (p. xviii). Our body, from which we generate questions about the world, as I understand it, then, is a living or dynamic set of relations through which we have come to know (including ourselves and others), we have come to be known, and how we continue to come to know these things as they shift throughout our many cosmic lives. Additionally, it enables us to manipulate the relations of power that would continue to see us as being fully formed.[40]

If I am to indulge in the academic practice of carving up knowledge-relations, I would say that my ontological commitment can be explained through tapwewin (speaking truth). In a

[40] Any given research project is influenced by the researcher's philosophical underpinnings (Moses and Knutsen, 2019; Creswell, 2018; Kovach, 2009, p. 26;). Philosophical presuppositions are meshed with the researcher's personal beliefs about the nature of the world and how one can go about studying it. Delanda explains that a theorist's ontology in particular "is the set of entities he or she assumes to exist in reality, the types of entities he or she is committed to assert actually exist" (DeLanda, 2002, p. 2). In the academic tradition, there are two broad and dominant ontologies that have emerged: naturalism and constructivism. Among political philosophical thought/embodiment, there is also discussion of a realist ontology, which understands reality as autonomous and, especially from the anthropocentrism of human thought, as capable of discerning that which is un/observable (p. 2). The lines between these ontologies point to their categorical separateness and singularity, which seems completely accurate and practically feasible (can one use sarcasm in a Ph.D. dissertation?). Yes, the work of many researchers falls somewhere in between these polemics, however, the extremes, as they are framed, have become the prominent ontological outlines influencing most methodological approaches within the social sciences (Henn, Weinstein, and Foard, 2009, p. 11).

description of her Cree methodology, Kovach (2009) explains that ontologically, the research "is about being congruent with a knowledge system that tells us that we can only interpret the world from the place of our experience" (p. 110). The only 'truth' or 'real world' that exists is known according to one's own tapwe (truth). Aporia (contradiction?) exists when creation is reduced to singularities of truth. For tapwewin, multiple truths (knowledge that is equally true) exist at once. When a truth collectively resonates among a set of relations, then it must be true. The purpose of tapwewin (speaking truth) is not to engage in adversarial argumentation per se like much academic critique does (i.e. speaking truth to power), but to truth-tell: to channel and share the accumulation of knowledge amassed through one's myriad relations (i.e. speaking truth about power and being powerful through our truths). These relations are earthly and not, human and not, of this lifetime and not. We are affixed to our tapwe, which extends our relations beyond our immediate field of vision as it, once uttered, generates shifting energy and movement. With this ontological commitment, I see my body as being more than the sum of the knowledge that has come to see me. *It* is my tapwewin. *I* am my "ontology." *I am my relations*. *My relations*. *Relations*.

Tapwewin is channeled through my material body, which is in part determined by being biologically descendant of my mom and dad. My name is Jessica Kolopenuk. It is also wâpiski-mîkwan. Yet also, waabishki sabekwe. I am a bear clan Ininiw woman, descendant of Chief Peguis' people who are Ininiw and Anishinaabe from the Red River region north of Winnipeg: the city whose name bears the characteristic of those mighty muddy rivers whose forks have brought peoples together for as long back as we have been peoples, perhaps for longer. I am a of Ininiwak. My people are treaty people, having negotiated and signed Treaty One in 1871. I belong to the McCorrister and Spence families. My father is a môniyaw. Having married into our

McCorrister family, he did not become an Indian, obvi; but, he did belong. This did not make him Cree. It made him family. What follows is my attempt to write my body.

1. Encoded

> *For my first, I begin where I did: the waters of my mother's body. From her I inherited a code. Mitochondrial DNA. It is no code, no secret to me, though. Haplogroup B, you say? Um, ok sure. Scientific stories abound, but knowing where my body comes from came to me through different means. I am Sylvia's daughter (♪). The blood that flows through, that flows out of me is my homeland. Embodied connection across time-space with all of the other bleeders. Lineage. The Red River. These are the bodies that made me. And this is where we are from.*[41]

In 2013 I sequenced my mitochondrial DNA (mtDNA)/the mitochondrial DNA of my grandmothers. It is conventionally believed that bio-moms can pass on mtDNA, bio-dads cannot. When I sequenced my (grandmothers') DNA, I was not trying to decode my identity. I was increasing my scientific literacy. What I came to learn, though, is that the story that genetic analysis tells aligns with my own family's knowledge about where we come from, albeit through much different narrative relations. The results of the sequencing saw that I am genetically linked to all of the bio-female relatives in my direct maternal lineage – the ones before me, and after

[41] I have written a series of 3 x 100s called "Red Rivers." Red Rivers is a three 100-word experiment in writing. 100s is a writing concept developed by University of Vermont English Professor Emily Bernard in 2009 and then launched by a variety of writing groups. 100s are meant to be flexible, open to structural and conceptual interpretation, exploratory, and experimental. I came across 100s through Dr. Kim TallBear who has published a series of "Critical Poly 100s" as a way to creatively express her auto-ethnographic polyamorous practice. As someone who is painfully disciplined in academic prose, and as challenging as it was, I enjoyed writing these 100s as a way to play with ideas in a manner that is unorthodox, unexpected, and less inhibited.

me, and, also, that we originate from the wide geographic region on the prairies that I know to be home.

2. The Moon

> *Living somewhere new was thrilling. But traveling across an ocean is hard. Lonely. The energies of those new (to me) places and people and ideas were interesting. Yet, everything my body touched was unfamiliar. I missed that mighty muddy River. Those prairie smells. My people. I needed something to feed my hunger for home. To tide me over. The Moon. Her movement tracks mine, tracks me. She is constant, even if unseen, keeping secrets untold of her dark sides. Her presence and permanence allow me to triangulate my body, up to hers, back down home. My more-than-land-based connection is restored.*

At the early stages of my research, I was speaking with a medicine woman from back home. I was asking her about the differences between Cree and Anishinaabe teachings about the colours red and purple as they particularly relate to the moon lodge. Clearly, my question was steeped in a way of thinking characteristic of my doctoral training, and I was expecting a systematic answer to my systematic question. Instead, I got a reminder of something else. Reorienting the question entirely and discarding my interest in the colours, the auntie, instead, talked about her kohkums. She said, "you know, I never knew if my grandmothers were Cree or Ojibwa, and I never cared: they were my kohkoms." A simple answer (the one I needed!) layered with a lot of complexity, and it reminded me that among kinship-based Ininiw and Anishinabeg peoplehoods, emphasizing tribal or national differences even as they relate to teachings about colours, is not most important – relationships are.

Within the academic teachings, there is conceptual imprecision around ideas of Indigenous peoplehood and nationhood. At times, they are used relatively interchangeably (see for instance Andersen, 2014; Alfred and Corntassel, 2005), and involving a collective political self-consciousness, a shared history, and territorial boundaries that predate colonialism (Andersen, 2014; Justice, 2006; Simpson, 2000; Alfred, 1995; Tully, 1995). Others have revised ethnonationalist portraits of peoplehood to include "four interlocking concepts of sacred history, ceremonial cycles, language, and ancestral homelands" (Corntassel, 2003, p. 91). Additionally, nationhood and peoplehood have been consistently associated with different tribal collectives like Mohawk, Blackfoot, Mikmaw, Métis, etc. (Andersen, 2014). Yet others approach tribal or national designations of peoplehood critically. Innes (2013), for example, explains that tribal identities were inaugurated by the fields of Anthropology and History, which have not understood and/or emphasized the interconnected relations *between* national groups like Cree, Assiniboine, Anishinaabeg, and Métis peoples on the northern Plains.

Indigenous feminist and queer Indigenous theorizations have also been critical of nation-based definitions of indigeneity noting the ways in which analytical emphases on national designations have contributed to concealing patriarchal relations of power that nurture colonialism. MacDougall (2006) argues that patrilineality in family genealogies gets privileged in Métis histories because of available written sources of record keeping that undermine the crucial roles Métis women have played in practicing wahkotowin – vital exercises of kinship found at the interstices of family, place, and political economy. Huhndorf and Suzack (2010) observe that since the 1960's the emphasis in Indigenous politics on the distinctiveness of Indigenous nations has contributed to a devaluation of gender issues (3). Engaging with this problem, queer Indigenous analyses claim to shift analyzers away from these nation-based self-

affirmations by rejecting "colonial insider/outsider binaries and ask[ing] how familial ties invite relationships across differences" (Driskill et. al., 2011).

Nationhood and peoplehood are likely analytically distinct ways of articulating the same thing (ie. Indigenous peoples' collective ancestral relationships to place and to one another), but the way that the terms get designated to tribal collectives belies the practices of kinship or wakohtowin-based peoplehood on the northern plains and elsewhere. Returning to Cardinal and Hildebrandt (2000), we can see an alternative approach. The elders offer a theoretical framework for approaching treaty implementation in Saskatchewan by pointing "to the inter-nation aspect of their spiritual traditions" (p. 9) and opposing any First Nation specific approach to treaties. Their understanding of Iyiniw peoplehood based on kinship and their stance on treaty implementation suggests that national identification schemes have tended to come at the expense of understanding how relationships have been a central political organizing formation among and between allegedly separate groups (human and not). In this understanding of peoplehood, politics lay therefore in kinship, more broadly expressed as states of being related (wakohtowin), not in a centralized and bounded nation among other nations.

Dene, Cree, Saulteaux, and Assiniboine elders describe the source of their existence as emanating from their being related to the first people, the nistamêyimâkan, on the People's Island, iyiniw ministik. Iyiniw peoplehood can be understood as emerging through ancestral relationships to place and relatives (human and non-human) through wakohtowin - the state of being related (Jobin, Friedland, Beausoleil, and Kapo, 2018). This version of peoplehood is based on the recognition of and by our relatives, not on the recognition by colonizers or colonial institutions. And it is unintelligible to non-Indigenous observers quick in their attempt to

intellectualize its meanings. It is an embodied impossibility for the descendants of colonizers to understand what it *feels* like to be born and live in the territories of your relatives/ancestors.

Wakohtowin is, as Moreton-Robinson's (2015) states about Indigenous sovereignty, based on "an ontology that exists outside of the logic of capital" (p. 191). It is not a possessive form of becoming. Being in relation animates Ininiwak peoplehood whereby each individual is a synecdochal part of the whole. Jodi Byrd (2011) writes of kinship sovereignties in a similar way. She writes, "[m]y definition of kinship sovereignty depends upon these structured networks as counter to nation-state-centered articulations of sovereignty that depend, in Enlightenment humanism, on the centrality of the sovereign individual" (Byrd ,2011, p. 264). Wakhotowin was not a word that I grew up hearing and it is not a word that I use on a regular basis. I learned, instead, about family and I continue to understand my body and the relations that sustain it according to that word.

I have been asked before whether the reason I critically study productions of indigeneity is to create an opening for my own acceptance as being Indigenous. Presumably, I get asked this question because of the phenotypical giveaway of my cyborg-ness (sic) and because I descend from women who, juridically speaking, have been disenfranchised from our community due to previous *Indian Act* rules around marrying non-Indians. Despite phenotypical and juridical appearances, though, I have not been wholly disconnected from my Ininiwak family, nor have I been completely disoriented from my ancestral territories. In saying this, I am not minimizing the impacts of colonial policy on Indigenous families, on being, and on practices of belonging. It is true, after all, that my family, like others, has been negatively impacted by the ebbs and flows of *Indian Act* registration among other colonial policies, but this is not the whole set of relations of the power of our connection. We have always found ways to remain oriented to place and to each

other in spite of juridical definitions of Indian-becoming and their material consequences. I do not see this as a set of practices of resistance, but rather of power. Within our family, kinship is a form of power, not resistance. Blood is a bio-symbol not centrally denoting race, but of the energy generated through family relationships to tack together peopled and territorial connections, unconditionally.

My body is power. Its materiality limits my choices. My white skin and blue eyes afford me the privilege in social situations to choose whether or not I identify as Indigenous, as Aboriginal, as Indian, as Native... Being Ininiw, on the other hand, is not about self-identification. It is an entire network that we are born into. This reality provides me without a choice. I am Ininiw. Before my energy arrived in this earthly body, I chose where it would land, who I would be, what roles I will play, what lessons I needed to learn, and which ones I could help others learn. It is a choice distinct from the liberal variety of self-identification. It means that our life on earth is distinguished as a state of being, not becoming. The liberal version depends on the body/mind construct, whereby one can become that which they would like to be. This choice – self-identification – paradoxically ends up enforcing the contingency of identity/difference upon bodies throughout their lives and leads to new and unpredictable configurations. Ininiwak becoming happens elsewhere. As such, my body is who I am: it is a physical manifestation of my energy, it carries my medicine, it contains the data of generations of my ancestors, and it is the conduit through which I channel tapwewin. For me, being kwe and becoming sexed and gendered, are inextricable from all of these things.

I have been trained academically in verses of social constructionism and critical race and whiteness theory. My graduate work has been devoted to analyzing the dangers of organizing human groups according to misguided perceptions of physical difference. Yet, I cannot deny the

power of sanguine materiality in shaping, at least partly, my sense of self and how my body is moored to the relations that I come from. Blood and bleeding links generations together through emergence.

When I first began to bleed, embodiment came to mean something new to me and, over the years, I have since reflected on what bleeding means to me as an Ininiw and Indigenous woman: how it connects me to my relatives, to my ceremonial items and medicine, and to the non-human worlds of my homeland. Biology has, at least in part, always shaped peoples. I continue to be intrigued with whether there is a way to talk about bloodlines to land that is not all about race; that opens, rather than forecloses spaces for kinship-making? And, I wonder if there is a way to talk about the physical capacities to bring new bodies forward in a way that does not put sole responsibility of reproducing peoples onto those bodies deemed female.[42]

3. White Feather

Welcome, Wâpiski Mîkwan. We've been waiting for you. This is yours.

A white eagle feather. Its beauty froze me in place and tears started streaming down my "ugly-cry" face.

The moon lodge is where I received her. The one that was prophesized for me. Wâpiski mîkwanwak, we are reunited. The energy of our bodies is resounding, materially

[42] I acknowledge that not only women bleed and that not all women do. I respect other bleeding and non-bleeding bodies and the way that each of us relates with our embodied realities. In the expression of my own body power, I do not wish to assert certitude to the categories of sex and gender typically identified with menstruation. I do not have answers to the questions I have posed. My intention, rather, is to speak my truth about my embodied keystone, but this is a limit/ed/ing endeavour. Writing harshly rigidifies any attempt to make sense of the deep and enduring connection to my mother, my grandmother, her mother, and on, and on. This work involves thinking through the networked connections - the nodes and lines - linking the relationships that I have to my own body, to my family, and to my homeland.

connected through blood. But what does it mean to carry moon medicine? I'm still not sure. For now, I will use it to re/code. Come back with me to my mother's waters, among the bleeders, to our homeland: to the Red River.

Research/er Relations and Integrity

I live in Ininiw and Indigenous worlds, but I do not study Indigenous peoples. I join critical Indigenous scholars like Audra Simpson, Kim TallBear, and Aileen Moreton-Robinson in refusing to make our own people the subject of our research. I join them in opting to, instead, study how non-Indigenous people, institutions, and logics come to know and form indigeneity with little or no input from us at all (and sometimes, how Indigenous peoples do this to ourselves). In order to create the methodological relations to conduct this sort of research, I have had to start living through new relations. Put differently, in order to get a sense of the fields of production under analysis, I have had to myself get *a feel* for them (Bourdieu ,1991, p. 8) - a sense of the stakes and logics that sustain them.

Relationship-building has been a method through which I have become invested in, and have affected science and science policy fields in Canada and the United States. It is a method that demands *caring more for the so-called research subject* than straightforward "participant observation" (TallBear, 2014; Schuurman and Pratt, 2002). This approach encourages me to speak "in concert with" (TallBear, 2014, p. 4) rather than "for" (p. 4), and (I add) "about" the agents within respective fields. TallBear (2014) insists that her own research process is about building relationships, professional networking with "colleagues (not "subjects"), and as an "opportunity for conversation and sharing of knowledge, not simply data gathering" (p. 2). My methodological relating has involved forming relationships with all kinds of people in science and science policy fields in order to get a sense of the breadth of its relational framework: from

the Minister of Science and Sport, to science communication experts, to other students, to early career scientists, to federal chief science advisors, to my auntie Sheila, to tri-council funding agency executives, people involved in the governance of their communities, to museum curators, and others.

Relationship-building as a methodological relation is required to *do* actual stuff in an attempt to manipulate the relations of coloniality that exist as the subject of critique: in my case, science and science policy fields. Research-doing entails exactly what it is named. It involves becoming a practitioner in technoscientific fields, not studying them; it involves being formative of them even if only among the most seemingly peripheral sets of relations. This has been a very important way of relating through Miskâsowin since technosciences, themselves, are outpacing the policies that can regulate them and academic disciplines that are trying to make sense them. Guided by a will-against-purity, against orthodox conceptual forms, Miskâsowin does not heuristically construct an inside and an outside of oneself, nor of relations of coloniality.

And so, I have had to be cross-sectoral and capable of speaking different languages, while maintaining the integrity of my body (meaning my tapwewin/knowledge). Fielding science has also required a rare incorporation of literatures: History of Science, Science and Technology Studies (STS), biomedical and genome science papers, Political Theory, Indigenous Studies, Bioethics, juridical texts, etc. and it has required at least basic technical competencies to understand them. I have built these (partial) competencies by investing in the field itself: forming relationships with genome scientists, historians and philosophers of science, STS scholars, science policy practitioners, and bioethicists; participating in multidisciplinary symposia, conferences, and invited talks; advising science policy actors and institutions; and helping to develop institutional spaces where Indigenous STS can operate. It has been out of my practices

of engagement that I have generated the critical Cree theory of science, technology, and society: Miskâsowin.

Self-awareness and being able to position oneself in research is not only about understanding the relationship between power and knowledge. It is also about showing, "respect to the ancestors and allows community to locate us" (Kovach, 2009: 110). There is no debate about the possibility of objectivity in this methodological approach. Human subjectivity is, instead, taken as a given, and therefore, methodologically, the researcher is responsible to be forthcoming about his or her own perspectives of the world. Without which, your integrity as a person is compromised. This promotes research transparency, and, therefore, accountability (Wilson, 2001, p. 177; Kovach, 2009, p. 36; Weber-Pillwax, 2001, p. 170).

The importance of responsibility lay in the methodological transparency of critical Indigenous theorizing that includes engagement with the embodied and emplaced knowledge about the colonial order that Indigenous peoples have multi-generationally amassed. The sharing of the stories of ourselves, our families, and our homes, is therefore, as Million (2009) explains, powerful for the accumulative affective force that personal yet shared experiences among Indigenous peoples reveal about the relations of power in our present. Our lives are the stuff of theory and the ways that we narrate them involves high political stakes (Million 2009). We bring Indigenous knowledge to the academy rather than focusing primarily on translating and sharing academic knowledge with the public, although people do that too. Sharing personal knowledge sends out lines of connections to others whose own experiences are linked to a collective one. This form of relationality among readers and writers aligns the shared struggles of many and it generates a collective energy, the movement of feelings from one body to another: power.

I have found that positioning oneself and speaking about responsibility is not only about whom the researcher is responsible to in the specific context of a research study. For me, research is about the responsibility that I have to all of the relations that sustain it and me (the researcher). Reflecting upon responsibility in this way is not so much about an ethical consideration in the formal sense of the word (i.e. in terms of institutional ethics); it is about understanding everyday relationships and *how they mean something* to knowledge production.

Indigenous methodologies are not only about producing sound research; they are an extension of living as peoples. I think about responsibility and accountability in terms of integrity. To speak of research integrity is part of my refusal to placate the liberalist frame of morality in research and the normativity of ethics that it promotes. Relations of coloniality restrict my ethics from being ethical in my own estimation. My research integrity is maintained, instead, by my actions to break down the presumed inevitability and nature of things, and enable possibilities for things to be different. Miskâsowin is one example. There is no codification of rules or procedures for this ethical framework because it is not an ethical framework. Rather, it is a set of shifting relations with people, peoplehoods, spaces, institutions, relatives, and routed through one's own core.

An example. At the early stages of this research, I spent three months on Oahu, HI. I was interested in learning about the Thirty Meter Telescope proposed to be built atop Mauna Kea on the Big Island. On the topical level, this research has not found a place within the dissertation, but theoretically, it certainly has. During my time in Hawai'i I dreamed of Mauna Kea and the grandmothers and grandfathers who told me that the mountain is *a body*. At the time, I was working though Foucault's *Discipline and Punish* and it was because of that dream that I began to think about the ways that Foucault's theory of power might be extended to understand how

non-human relatives have also been seen, known, produced, and productive through modern ocular relations. My discussion of star women in Chapters 1 and 2 was informed by my body's relationships with a book, a dream, Kanaka Maoli peoplehood and people, and ancestral/material energies.

There is a certain amount of existential angst and added labour that comes with devoting as much time and energy into learning about, becoming a part of, and affecting predominantly non-Indigenous fields in order to write about one's relationship to them. As a result, I have found it necessary, as part of my relationship-building-as-method, to re/invest in the communities that I am a part of, including my family, my ceremonial communities, and my academic network. These investments have included much travel back home to Winnipeg, participation at ceremonies, living room visits, Facetime chats, text messages, road trip talks, crisis support, meetings, and conferences.

Integrity is a frequentative process where I have reflected on whether I, personally, should be in a role to create knowledge. My loved ones, like many Indigenous peoples, are still reeling from colonially-induced traumas and my failure to set "appropriate boundaries" that would keep them at arm's length so that I may do my research has been as difficult as it has been productive. They are also there to support me guiding my research process with lessons about kindness, humility, trauma, and unconditional love. My ceremonial communities support me in the role that I have been given as ogichitakwe. They guide me in a loving way to have the courage to continue on the path of truth-telling. My academic community checks my integrity too for the passability of the knowledge that I smuggle into the academy. What is more, my academic kin influence the knowledge relations that I engage. Why did I pick one theorist over another?; why did I focus on genomics and not microbiomes?; why do I think race/gender is so

important? These are questions that we are asked and sometimes, the answers simply lay in being a matter of the relations that train you. We are inundated with data on a second-by-second basis and shaped by the forces of the increasingly neoliberal academy that pushes hyper-productivity, added value, and individualism. It is nearly impossible to know all the things in any given project. Our academic relations guide us in particular ways, just as our other relations do. We rely on the trust we have for them to direct us and we become heavily reliant on them for more than scholarly guidance.[43] All of these relationships inform my tapwewin and in expressing miskâsowin, the work has integrity. Being in relation with the communities that I am a part of has made this analysis. I theorize what matters because I am connected through the relations that matter to me.

[43] I do not mean to over-determine the role of supervisors, create an excuse for being analytically lazy, or any other contortion of the statement. The growing value placed on the quantification of knowledge is an honest reality that academia is facing and reflecting on how that is influencing the strategies used in the academy is important.

Bibliography

Adas, M. (1989). Machines as the measure of men: Science, technology, and ideologies of Western dominance. Ithaca, NY: Cornell University Press.

Albert, M., & Kleinman, D. L. (2011). Bringing Pierre Bourdieu to science and technology studies. Minerva, 49: 263-273.

Albert, M., Laberge, S., & Hodges, B. (2009). Boundary work in the ehealth research field: Biomedical and clinical scientists' perceptions of social science work. Minerva 47(2): 171-194.

Albert, M., Laberge, S., Hodges, B. D., Regehr, G., & Lingard, L. (2008). Biomedical scientists; perceptions of social science in health research. Social Science & Medicine, 66: 2520-2531.

Albert, Mathieu, Suzanne Laberge, Brian D. Hodges, Glenn Regehr, and Lorelei Lingard. 2008. Biomedical scientists' perception of social science in health research. Social Science & Medicine 66: 2520–2531.

Alfred, T. (2005). Wasa′se: Indigenous pathways of action and freedom. Peterborough, ON: Broadview Press.

----- (1995). Heeding the voices of our ancestors: Kahnawake Mohawk politics and the rise of native nationalism. Toronto, ON: Oxford University Press.

Alfred, T., & Corntassel, J. (2005). Being Indigenous: Resurgences against contemporary colonialism. Government & Opposition, 40(4): 597-614.

Altamirano-Jiménez, Isabel. (2013). Indigenous Encounters with Neoliberalism: Place, Women, and the Environment in Canada and Mexico. Vancouver, BC: University of British Columbia Press.

Ambler, Stella (Chair). (March 2014). Invisible Women: A Call to Action. A Report on Missing and Murdered Indigenous Women in Canada. A Report of the Special Committee on Violence Against Indigenous Women. 41st Parliament, second session. Ottawa, ON.

Amnesty International. 2009. No More Stolen Sisters: The Need For a Comprehensive Response to Discrimination and Violence Against Indigenous Women in Canada. Accessed from https://www.amnesty.ca/sites/amnesty/files/amr200122009en.pdf

----- 2004. Stolen Sisters: A Human Rights Response to Discrimination and Violence Against Indigenous Women in Canada. Accessed from https://www.amnesty.ca/sites/amnesty/files/amr200032004enstolensisters.pdf

Ancestry. (2018). “Discover What Makes You Uniquely You.” Accessed from https://www.ancestry.ca

Andersen, C. (2014). “Métis”: Race, recognition, and the struggle for Indigenous peoplehood. Vancouver, BC: University of British Columbia Press.

----- (2011). Moya ‘tipimsook (“the people who aren’t their own bosses”): Racialization and the misrecognition of “Métis” in Upper Great Lakes ethnohistory.” Ethnohistory 58(1): 37-63.

----- (2009). “Critical Indigenous studies: From difference to density.” Cultural Studies Review, 15(2): 80-100.

----- (2008). From nation to population: The racialisation of ‘Métis’ in the Canadian census. Nations and Nationalism, 14(2): 347–368.

Andersen, C., & O’Brien, J. (Eds.). (2016). Sources and methods in Indigenous Studies. London, United Kingdom: Routledge.

Anderson, K. (2001). Recognition of being: Reconstructing Native womanhood. Toronto, ON: Sumach Press.

Arbour, L., & Cook, D. (2006). DNA on loan: Issues to consider when carrying out genetic research with Aboriginal families and communities. Public Health Genomics, 9(3): 153 160.

Arendt, H. (1958). The human condition. Chicago, IL: University of Chicago Press.

Arvin, Maile. (2019). Possessing Polynesians: The science of settler colonial whiteness in Hawai’i and Oceania. Durham: Duke University Press.

Arvin, Maile, Eve Tuck and Angie Morrill. (2013). “Decolonizing Feminism: Challenging Connections between Settler Colonialism and Heteropatriarchy,” Feminist Formations, 25 (1), 8-34.

Assembly of First Nations. 2012. Coordinated and Urgent Action to End Violence Against Indigenous Women & Girls – Towards a National Action Plan. Accessed from https://www.afn.ca/uploads/files/misssing_and_murdered_indigenous_women/af ndviolencepaper-naws.pdf

Assembly of Nova Scotia Mi’kmaq Chiefs. (March 22, 2018). “Metis Membership Cards and Mi’kmaw Aboriginal and Treaty Rights.” Letter to ministers Carolyn Bennett, Jane Philpott, Jody Wilson-Raybould, and Ralp Goodale. Accessed from http://mikmaqrights.com/wp-content/uploads/2018/06/2018-03-22-KMKNOLetter Re_Metis-Membership-Cards.pdf

----- December 19, 2013. “Assembly Affirms the Mi’kmaq as Exclusive Rights Holders in NS.” Accessed from http://mikmaqrights.com/wp-content/uploads/2018/07/Community Notice_Metis-Resolution_19Dec13.pdf

Aubert, Guillaume. 2004. “‘The Blood of France’: Race and Purity of Blood in the French Atlantic World.” The William and Mary Quarterly, 3rd Series 61(3): 439-478.

Awang, S. S. (2000). Indigenous nations and the Human Genome Diversity Project. In Dei, G. J. S., Hall, B. L., & Rosenberg, D. G. (Eds.). Indigenous knowledges in global contexts: Multiple readings of our world. (pp. 120-136). Toronto, ON: University of Toronto Press.

Babbitt, J. D., ed. 1965. Science in Canada: Selections from the Speeches of E. W. R. Steacie. Toronto: University of Toronto Press.

Backhouse, Constance. (1999). Colour-Coded: A Legal History of Racism in Canada, 1900 1950. Toronto, Buffalo, and London: University of Toronto Press.

Bamshad, Mike. (2005). “Genetic Influences on Health: Does Race Matter?” JAMA, 294,8.

Bardill, Jessica. (2017). “Comparing Tribal Research and Specimens Policies: Models, Practices, and Principles.” International Indigenous Policy Journal 8 (4): 1–22.

----- (2010). “Information and Misinformation Already Had: DNA and Tribal Citizenship.” GeneWatch, 23(3), 8-9. Accessed from http://www.councilforresponsiblegenetics.org/genewatch/GeneWatchArchives.a px#

Barker, J (ed.). (2017). *Critically sovereign: indigenous gender, sexuality, and feminist studies*. Durham: Duke University Press.

----- (2006). Gender, sovereignty, and the discourse of rights in Native women’s activism. Meridians: Feminism, Race, Transnationalism, 7(1): 127-161.

----- (2002). The Human Genome Diversity Project: ‘Peoples,’ ‘populations,’ and the cultural politics of identification. Cultural Studies, 18(4): 578-613.

Barrera, Jorge and Tiffiany Foxcroft. (June 13, 2018). “Heredity or Hoax?: How Dog DNA Helped Uncover a Suspected Indian Status Scam.” CBC News. Accessed from https://newsinteractives.cbc.ca/longform/dna-ancestry-test\

Bastien, B. (2004). Blackfoot ways of knowing. Calgary, AB: University of Calgary Press.

Benhabib, S. (2002). The claims of culture: Equality & diversity in the global era. Princeton, NJ: Princeton University Press.

Berthier-Foglar, S., Collingwood-Whittick, S., & Tolazzi, S. (Eds.). (2012). Biomapping Indigenous peoples: Towards an understanding of the issues. Amsterdam, Netherlands: Rodopi.

Bieber, Frederick R. (2006). "Turning Base Hits into Earned Runs: Improving the Effectiveness of Forensic DNA Data Bank Programs." Journal of Law, Medicine & Ethics, (summer), 222-233.

Bird, Hilary. (February 26, 2018). "International forensics lab unlocks 28-year-old Yellowknife missing person case." *CBCNews*. Accessed from https://www.cbc.ca/news/canada/north/keadjuk-dna-bosnian-lab-1.4551297

Birch, Kean. (2016). "Rethinking Value in the Bio-Economy: Finance, Assetization, and the Management of Value." Science, Technology, and Human Values 42 (3): 460–90.

Blair, Tony. (June 26, 2000). Remarks Made by the President, Prime Minister Tony Blair of England (via satellite), Dr. Francis Collins, Director of the National Human Genome Research Institute, and Dr. Craig Venter, President and Chief Scientific Officer, CeleraGenomics Corporation, on the Completion of the First Survey of the Entire Human Genome Project. East Room, The White House, Washington, D.C. Retrieved from https://www.genome.gov/10001356/june-2000-white-houseevent/

Blaze Carlson, Kathryn. (2014, July 27). Canada Works to Institute a National Missing Persons DNA Databank. The Globe and Mail. Retrieved from https://www.theglobeandmail.com/news/national/without-a trace/article19800319/?page=all

Blaze Carlson, Kathryn and Renata D'Alieso. (2015, February 26). Planned Canadian DNA Data Bank Will Fall Short of Gold Standard as Tool in Search for Missing Indigenous Women. The Globe and Mail. Retrieved from https://www.theglobeandmail.com/news/national/planned-canadian-dna-databank-will fall-short-of-gold-standard-as-tool-in-search-for-missing-indigenous women/article23221815/

Blumenback, J. F. (1865). De Generis Humanitarian's Varietate Native Liber [On the Natural Varieties of Mankind]. In T. Bendyshe (Ed., & Trans.), *The Anthropological Treatises of Johann Friedrich Blumenback and the Inaugural Dissertation of John Hunter* (pp. 65 144). London, UK: Logman, Gree, Longman, Rober, & Green for the The Anthropological Society of London. (Original article published in 1775).

Boffa, Jody, Malcolm King, Kathleen McMullin, Richard Long. (2011). "A Process for the Inclusion of Aboriginal People in Health Research: Lessons from the Determinants of TB Transmission Project." Social Science & Medicine, 72, 733 738.

Bolnick, Deborah A. (2003). "'Showing Who They Really Are': Commercial Ventures in Genetic Genealogy." Paper presented at the American Anthropological Association meeting, Chicago, IL.

Bolnick, A. B., Bonine, H. M., Mata-Miguez, J., Kemp, B. M., Snow, M. H., Leblanc, S. A. (2012). Nondestructive sampling of human skeletal remains yields ancient nuclear and mitochondrial DNA. American Journal of Physical Anthropology, 147: 293-300.

Bolnick, D. A., Raff, J. A., Springs, L. C., Reynolds, A. W., & Miró-Herrans, A. T. (2016). Native American Genomics and Population Histories. *Annual Review of Anthropology*, *45*(1), 319–340. doi: 10.1146/annurev-anthro-102215-100036

Bourdieu, P. (1991). The peculiar history of scientific reason. Sociological Forum, 6(1): 3-26.

----- (1987). The force of law: Toward a sociology of the juridical field. Hastings Law Journal, 38: 814-53.

Bowekaty, M. and Davis, D. (2003). Cultural issues in genetic research with American Indian and Alaskan Native people. IRB: Ethics and Human Research, 25(4): 12-15.
Bowler, P. J. & Whyte, N. (Eds.). (1997). Science and society in Ireland: The social context of science and technology in Ireland, 1800-1950. Belfast, United Kingdom: Queen's University.

Boyden, J. (August 2, 2017). "My name is Joseph Boyden: Being Indigenous isn't all about DNA, it's about who claims you." *MacLean's*. Accessed from https://www.macleans.ca/news/canada/my-name-is-joseph-boyden/

Boyer, B.B., D. Dillard, E.L. Woodahl, R. Whitener, K.E. Thummel, and W. Burke. (2011). "Ethical Issues in Developing Pharmacogenetic Research Partnerships with American Indigenous Communities." Clinical Pharmacology & Therapeutics, 89(3), 343-345.

Brant-Castellano, M. (2000) Updating traditions of Aboriginal knowledge. In Dei, G. J. S., Hall, B. L., & Rosenberg, D. G. (Eds.). Indigenous knowledges in global contexts: Multiple readings of our world. (pp. 21-36). Toronto, ON: University of Toronto Press.

Brockway, L. H. (1979). Science and colonial expansion: The role of the British Royal Botanic Gardens. American Ethnologist, 6(3).

Brown, Wendy. (2010). Walled States, Waning Sovereignty. New York: Zone Books.

Buck, Wilfred. (2018). Tipiskawi kisik: Night sky star stories. Winnipeg, MB: Manitoba First Nations Education Resource Centre Inc.

----- (2016). Cree mythology written in the stars [video file]. Retrieved from http://www.cbc.ca/radio/unreserved/from-star-wars-to-stargazing1.3402216/cree mythology-written-in-the-stars-1.3402227

Buckley, Malina. (2012). Towards more effective missing women investigations: police relationships with victims' families, the community and the media. A policy discussion report prepared for the missing women commission of inquiry. Accessed from https://missingwomen.library.uvic.ca/wp-content/uploads/2010/10/POL-2-March-2012 MB-Towards-More-Effective-Missing-Women-Investigations.pdf

Buffon, G-L. (1749c). Variétés dans l'espèce humaine, in Histoire naturelle, générale et particulière. Paris: Imprimerie Royale, T. III, 371–530.

Butz, D. (2008). "Sidelined by the Guidelines: Reflections on the Limitations of Standard Informed Consent Procedures for the Conduct of Research." ACME: An International EJournal for Critical Geographies, 7(2), 239-259.

Byrd, J. A. (2011). The transit of empire: Indigenous critiques of colonialism. Minneapolis, MN: University of Minnesota Press.

Cajete, G. (2000). Native science: Natural laws of interdependence. Santa Fe, NM: Clear Light Publishers.

Canadian Medical Association. (2017). "Direct-to-consumer genetic Testing." CMA Policy.

Canadian Tuberculosis Standards, 7th Edition. (2014). Public Health Agency of Canada.

Cardinal-McTeague, Warren. [@WCM_Botany]. (2019, August 7). If genomics is the study of the genome of an individual, then metagenomics is the genomic study of multiple individuals, often as a mixed environmental sample. By comparison, similar sounding metabolomics is the study of metabolites/chemical synthesis present in an individual [Tweet]. Retrieved from https://twitter.com/WCM_Botany/status/1159162016961040385?s=20

Cardinal, H., & Hildebrandt, W. (2000). Treaty elders of Saskatchewan: Our dream is that our peoples will one day be clearly recognized as nations. Calgary, AB: University of Calgary Press.

Cavanagh, E., & Veracini, L. (Eds.). (2017). *The Routledge handbook of the history of settler colonialism*. New York: Routledge.

CBC News. (2019, March 8). Trudeau apologizes for 'colonial,' 'purposeful' mistreatment of Inuit with tuberculosis. CBC News. Retrieved from https://www.cbc.ca/news/canada/north/trudeau-apology-tuberculosis-iqaluit 1.5047805

CBC News. September 14, 2015. "Métis in Gaspé hope DNA tests will grant them more rights: Finding could help community defend hunting rights in court." Accessed from https://www.cbc.ca/news/canada/montreal/dna-tests-metis-in-gaspe1.3227589

Cho, Mildred and Pamela Sankar. (2004). "Forensic Genetics and Ethical, Legal, and Social Implications Beyond the Clinic." Nature Genetics, 36, S8-S12.

Christie, G. (2011). Indigeneity and sovereignty in Canada's far North: The Arctic and Inuit sovereignty. South Atlantic Quarterly, 110(2): 329-346.

Clark, G. A., M. A. Kelley, J. M. Grange, & M. C. Hill. (1987). "The Evolution ofMycobacterial Disease in Human Populations: A Reevaluation." Curr Anthropol, 28, 45-62.

Claw, K. G., Anderson, M. Z., Begay, R. L., Tsosie, K. S., Fox, K., Summer internship for INdigenous peoples in Genomics (SING) Consortium, and Garrison, N. A.(2018). "A Framework for Enhancing Ethical Genomic Research with Indigenous Communities." Nature Communications, 9(2957), 1-7.

Clinton, Bill. (June 26, 2000). Remarks Made by the President, Prime Minister Tony Blair of England (via satellite), Dr. Francis Collins, Director of the National Human Genome Research Institute, and Dr. Craig Venter, President and Chief Scientific Officer, Celera Genomics Corporation, on the Completion of the First Survey of the Entire Human Genome Project. Retrieved from https://www.genome.gov/10001356/june-2000-whitehouse-event/

Cook-Lynn, E. (1997). Who stole Native American studies? Wicazo Sa Review, 12(1): 9-28.

Cooper, M. H. (2009). Commercialization of the university and problem choice by academic biological scientists. Science, Technology and Human Values, 34(5): 629 653.

Corach, D., Sala, A., Penacino, G., Iannucci, N., Bernardi, P., Doretti, M.,…Hagelberg, E. (1997). "Additional Approaches to DNA Typing of Skeletal Remains: The Search for "Missing" Persons Killed During the Last Dictatorship in Argentina." Electrophoresis, 18, 1608-1612.

Corntassel, J. (2003). Who is Indigenous? Peoplehood and ethnonationalist approaches to rearticulating Indigenous identity. Nationalism and Ethnic Politics, 9(1): 75-100.

Coulthard, G. S. (2014). Red Skin, White Masks: Rejecting the Colonial Politics of Recognition. Minneapolis: University of Minnesota Press.

----- (2010). "Resisting Culture: Seyla Benhabib's Deliberative Approach to the Politics of Recognition in Colonial Contexts." In David Kahane, Daniel Weinstock, Dominique Leydet, and Melissa Williams (Eds.), Deliberative Democracy in Practice (138-154). Vancouver and Toronto: UBC Press.

Craft, A. (2013). Breathing life into the Stone Fort Treaty: An Anishnabe understanding of Treaty One. Saskatoon, SK: Purich Publishing.

Crawford, Alison. (2017, May 3). Missing Person DNA Databank Running 1 Year Behind Schedule. CBCnews. Retrieved from http://www.cbc.ca/news/politics/missing-persons dna-remains-databank1.4095878

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: choosing among five approaches*. Los Angeles, CA: Sage.

Crosby, A., & Monaghan, J. (2012). Settler governmentality in Canada and the Algonquins of Barriere Lake. Security Dialogue, 43(5): 421-438.

Cunningham, H. 1998. Colonial encounters in postcolonial contexts: Patenting Indigenous DNA and the Human Genome Diversity Project. Critique of Anthropology, 18(2): 205-233.

Cunningham, E. H., Cameron, V. A., Evans, J., Irvine, V., Pitama, S., & Robertson, P. (2007). The development of guidelines for handling samples and specimens collected for research involving Māori. New Zealand Medical Journal, 120(264): 117-119.

Daschuk, J. W. (2013). Clearing the Plains: Disease, Politics of Starvation, and The Loss of Aboriginal Life. Regina, SK: University of Regina Press.

Dashhuk, J. W., Paul Hackett, & Scott MacNeil. (2006). "Treaties and Tuberculosis: First Nations People in Late 19th- Century Western Canada, a Political and Economic Transformation." CBMH/BCHM, 23(2), 307-330.

Dei, G. J. S., Hall, B. L., & Rosenberg, D. G. (Eds.). (2000). Indigenous knowledges in global contexts: Multiple readings of our world. Toronto, ON: University of Toronto Press.

DeLanda, M. (2002). Intensive science and virtual philosophy. London: Continuum.

Deleuze, G. and Félix Guatarri. (1987). A thousand plateaus: Capitalism and schizophrenia. Minneapolis: University of Minnesota Pres.

Deloria, Philip Joseph. 1998. Playing Indian. New Haven, CT: Yale University Press.

Deloria Jr., Vine. (1969). *Custer died for your sins*. New York, N.Y. : Macmillan Company.

----- (1995). Red earth, white lies: Native Americans and the myth of scientific fact. New York, NY: Scribner.

Deveaux, M. (2000). Conflicting equalities? Cultural group rights and sex equality. Political Studies, 48(3): 522-539.

Dhamoon, R. (2009). Identity/difference politics: How difference is produced, and why it matters. Vancouver, BC: University of British Columbia Press.

DiAngelo, Robin. (2011). “White Fragility.” International Journal of Critical Pedagogy, 3(3), 54-70.

Diaz, V. M. (2016). “Stepping in it: How to smell the fullness of indigenous histories.” Methods in Indigenous history, Edited by Jean O'Brien and Chris Andersen, 86–92. London and New York: Routledge.

----- (2012). “Sniffing Oceania’s behind.” *The Contemporary Pacific*, 24(2): 323 344.

Dick, C. (2006). The politics of intragroup difference: First Nations' women and the Sawridge Dispute. Canadian Journal of Political Science, 39(1): 97-116.

Dodson, M., & Williamson, R. Indigenous peoples and the morality of the Human Genome Diversity Project. Journal of Medical Ethics, 25: 204-208.

Doerfler, J. (2015). Those who belong: Identity, family, blood, and citizenship among the White Earth Anishinaabeg. East Lansing, MI: Michigan State University Press.

Doerfler, J., Sinclair, N., & Stark, H. (Eds.). (2013). Centering Anishinaabeg studies: Understanding the world through stories. East Lansing, MI: Michigan State University Press.

Dransfeld, Rosie. (2012). Who Cares? [Video]. Edmonton, AB: National Film Board of Canada.

Driskill, Qwo-Li, Chris Finley, Brian Joseph Gilley, Scott Lauria Morgensen (eds). (2011). Queer Indigenous Studies: Critical Interventions in Theory, Politics, and Literature. University of Arizona Press.

Dua, E. (2007). Exclusion through inclusion: Female Asian migration in the making of Canada as a white settler nation. Gender, Place and Culture, 14(4): 445-66.

Duster, Troy. (2012). “The Combustible Intersection: Genomics, Forensics, and Race.” InLisa Nakamura and Peter A. Chow-White (Eds.), Race After the Internet (31027). New York: Routledge.

Eberts, M. (2010). McIvor: Justice delayed – again. Indigenous Law Journal, 9(1): 15-46.

Eshleman, Jason A., Ripan S. Malhi, and David Glenn Smith. (2003). “Mitochondrial DNA Studies of Native Americans: Conceptions and Misconceptions of the Population Prehistory of the Americas.” Evolutionary Anthropology 12 (1): 7–18.

Epstein, Steven. (2007). Inclusion: The Politics of Difference in Medical Research. Chicago & London: The University of Chicago Press.

Evidence for Democracy. (2013). Who We Are. Retrieved from https://evidencefordemocracy.ca/en/about/who

Fanon, Frantz. (1965). A Dying Colonialism. New York: Grove Press.

Ferguson, R. G. (1928). Tuberculosis Among the Indians of the Great Canadian Plains. London: Adler and Son.

Finley, Chris. (2011). ""Decolonizing the Queer Native Body (and Recovering the NativeBull Dyke)" Bringing 'Sexy Back' and Out of Native Studies' Closet." In Qwo-Li Driskill, Chris Finley, Brian Joseph Gilley, and Scott Lauria Morgensen (Eds.), Queer Indigenous Studies: Critical Interventions in Theory, Politics, and Literature, 31-42. Tuscon: University of Arizona Press.

Fiske, Jo-Anne. (2006). "Boundary Crossings: Power and the Marginalisation in the Formation of Canadian Aboriginal Women's Identities." Gender and Development, 14(2), 247-258.

Fitzgerald, Mark J., Lei Wang, & R. Kevin Elwood. (2000). "Tuberculosis: 13. Control of the Disease Among Aboriginal People in Canada." CMAJ, 162(3), 351-5.

Fixico, D. L. (1996). "Ethics and Responsibility in Writing American Indian History." American Indian Quarterly, 20(1), 29-39.

Flynn, T. R. (1993). Foucault and the eclipse of vision. In *Modernity and the hegemony of vision,* edited by David M. Levin (pp. 273–286). Berkeley: University of California Press.

Fong, M., Braun, K. L., & Chang, R. M. (2006). Native Hawaiian preferences for informed consent and disclosure of results from genetic research. Journal of Cancer Education, 21(Suppl. 1): S47–52.

Forrest, Maura. January 30, 2018. "Indigenous or a French colonist? How the fight over this 17th-century woman's identity could affect tens of thousands of herdescendants: A debate about one woman's shifting identity reveals less about her than it has about the value, both political and sentimental, of being Indigenous." National Post. Accessed from https://nationalpost.com/news/canada/a-new-world mystery-how-a-17th-century-french woman-became-indigenous-thenbecamewhite-again

Foster, M., & Sharp, R. (2000). Genetic research and culturally specific risks: One size does not fit all. Trends in Genetics, 16(2), 93-95.

Foucault, M. (2010). *The order of things: an archaeology of the human sciences*. London: Routledge.

----- (2003). Society Must Be Defended: Lectures at the Collège de France, 1975-1976 (1st ed.). New York, NY: Picador.

----- (1995). Discipline and punish: The birth of the prison. New York, NY: Random House, Inc.

----- (1981). "Orders of Discourse." In Untying the Text: A Post-Structuralist Reader edited by Robert Young, 48-78. London and Boston: Routledge & Kegan Paul.

Fourcade, M. (2009). Economists and societies: Discipline and profession in the United States, Britain, and France, 1890s to 1990s. Princeton, NJ: Princeton University Press.

Fourney, R. M. (April 24, 2007). Standing committee on public safety and national security: evidence. Number 039, 1st Session, 39th Parliament. Accessed from https://www.ourcommons.ca/DocumentViewer/en/39-1/SECU/meeting-39/evidence

Fox Keller, Evelyn. 1995. Refiguring Life: Metaphors of Twentieth-Century Biology. New York: Columbia University Press.

Frank, A. G. (1967). Capitalism and underdevelopment in Latin America (Vol. 93). New York, NY: New York University Press.

Galilee, G. 1564-1642. (1998). Sidereus nuncius: Venice, 1610. Palo Alto, CA: Octavo.

Garrison, N. (2012). Genomic justice for Native Americans: Impact of the Havasupai Case on genetic research. Science, Technology, and Human Values, 38(2): 201-223. doi:10.1177/0162243912470009.

Garroutte, E. M. (2003). Real Indians: Identity and the Survival of Native America. Berkeley, CA: University of California Press.

Gaudry, A. (2015). Respecting Métis nationhood and self-determination in matters of Métis identity. In K. Burnett & G. Read, Aboriginal history: A reader (2nd ed., pp. 152-163). Don Mills, United Kingdom: Oxford University Press.

----- (2013). "The Metis-ization of Canada: The Process of Claiming LouisRiel, Metissage, and the Metis People as Canada's Mythical Origin." Aboriginal policy studies 2(2): 64-87.

Gaudry, Adam, and Darryl Leroux. (2017). "White Settler Revisionism and Making Métis Everywhere: The Evocation of Métissage in Quebec and Nova Scotia." Critical Ethnic Studies 3 (1): 116–42.

Genome Canada. (2018, January 23). "Canadian Patients to Benefit from Major Investment in Genomics and Precision Medicine Health Research." Retrieved from https://www.genomecanada.ca/en/news/canadian-patients-benefit-major investmentgenomics-and-precision-health-research).

----- . (n.d.). Funding Opportunities: Societal Implications of Genomics Research. Retrieved from https://www.genomecanada.ca/en/programs/leading-edge technologies/fundingopportunities/societal-implications-genomics-research)

Gobineau, M. A. de (1853-1855). Essai sur l'inégalité des races humaines. Paris, FR: Firmin Didot Frères.

Goeman, M. (2013). Mark my words: Native women mapping our nations.Minneapolis, MN: University of Minnesota Press.

Gotell, L. (2002). Queering law: Not by Vriend." Canadian Journal of Law and Society, 17(1): 89-113.

Government of Canada. (2014). Action Plan to Address Family Violence and Violent Crimes Against Aboriginal Women and Girls. Retrieved from http://www.swc cfc.gc.ca/violence/efforts/action-eng.pdf

Grammond, S. (2009). Discrimination in the rules of Indian status and the McIvor Case. Queen's Law Journal, 35(1): 421-32.

Green, J. (2007). Balancing strategies: Aboriginal women and constitutional rights in Canada. In J. Green (Ed.), Making Space for Indigenous Feminism (pp. 140-59). London, United Kingdom: Zed Books.

----- (2001). "Canaries in the mines of Citizenship: Indian Women in Canada." Canadian Journal of Political Science, XXXIV(4) (Dec.), 715-738.

Green, Rayna. (1975). "The Pocahontas Perplex: The Image of Women in American Culture." Massachusetts Review, 16(4), 698-714.

Greenwood, Celia M. T., T. Mary Fujiwara, Lucy J. Boothroyd, Mark A. Miller, Danielle Frappier, E. Anne Fanning…Kenneth Morgan. (2000). "Linkage of Tuberculosis to Chromosome 2q35 Loci, Including NRAMP1 in a Large Aboriginal Canadian Family." The American Journal of Human Genetics, 67, 405-416.

Greer, A. (1987). Immigration: Where Canada's forefathers stood. Toronto, ON: Citizens for Foreign Aid Reform Inc.

Grosz, Elizabeth. (1994). Volatile Bodies: Toward a Corporeal Feminism. Crows Nest,AUS: Allen and Unwin.

Hackett, F. J. Paul. (2012). "'That Will Not Be Done Again:' The Fort Alexander Preventorium and the Fight Against Tuberculosis." Native Studies Review, 21, 5 44.

----- (2002). "A Very Remarkable Sickness": Epidemics in The Petit Nord, 1670-1846. Winnipeg, MB: University of Manitoba Press.

Hadden, Eleanor Louise. (2018). "BCG Tuberculosis Vaccine Experiment on Southeast Alaska Natives: A Medical Experiment Without Informed Consent." In Robert Henry, Amanda LaVallee, Nancy Van Styvendale, & Robert Alexander Innes (Eds.), Global Indigenous Health: Reconciling the Past, Engaging the Present, Animating the Future (61-75). Tucson: University of Arizona Press.

Hall, Lisa Kahaleole. (2009). "Navigating Our Own 'Sea of Islands': Remapping a Theoretical Space for Hawaiian Women and Indigenous Feminism." Wicazo Sa Review, (Fall), 15-38.

Hall, S. (1995). The west and the rest: Discourse and power. In S. Hall, D. Held, D. Hubert, & K. Thompson (Eds.), Modernity: An Introduction to Modern Societies. Cambridge, United Kingdom: Polity.

Hamilton, Graeme. July 7, 2016. "Mikinaks Call Themselves Quebec's Newest Aboriginal Community, Others are Calling Them a Fraud." National Post. Accessed from https://nationalpost.com/news/canada/the-mikinaks-callthemselves-quebecs-newest aboriginal-community-others-are-calling-them-afraud

----- July 22, 2016. "'We're a Government': His Excellency Grand Chief Carle Returns with Creation of New Community." National Post. Retrieved from https://nationalpost.com/news/canada/were-a-government-his-excellency-grandchief carle-returns-to-spotlight-with-creation-of-new-community

Hamilton, J. A. (2009). Indigeneity in the courtroom. New York, NY: Routledge.

Harding, S. (2011). Beyond Postcolonial Theory: Two undertheorized perspectives onscience and technology. In S. Harding (Ed.), The Postcolonial Science and Technology Studies Reader (pp. 1-31). Durham, NC: Duke University Press.

----- (2008). Sciences from below: feminisms, postcolonialities, and modernities. Durham and London: Duke University Press.

Haraway, Donna J. (2016). Manifestly Haraway. Minneapolis: University of Minnesota Press.

----- (2004). The Harraway Reader. New York, NY: Routledge.

----- (1997). IModest_Witness@Second_Millennium.FemaleMan©_Meets_OncoMouse™. New York: Routledge.

Harris, C. (1995). Whiteness as Property. In K. Crenshaw, N. Gotanda, G. Peller and K. Thomas (eds.), Critical Race Theory: The key writings that formed the movement (pp. 276-291). New York, NY: The New Press.

Harris, S. J. (2005). Jesuit scientific activity in the overseas missions, 1540–1773. Isis, 96: 71–79.

Harrison, M. (2005). Science and the British Empire. Isis, 96: 56–63.

Harry, D. (2005). Acts of self-determination and self-defense: Indigenous people responses to biocolonialism. In S. Krimsky, & P. Shorett, Rights and liberties in the biotech age (pp. 87–97). Lanham, MD: Rowman & Littlefield.

----- (1993). The Human Genome Diversity Project. Abya Yala News, 8(4): 13-15.

Harry, D., & Dukepoo, F. C. (1998). Indians, genes and genetics: What Indians should know about the new biotechnology. Retrieved from http://www.ipcb.org/pdf_files/primer.pdf

Headrick, D. R. (Ed.). (1981). The tools of empire: Technology and European imperialism in the nineteenth century. New York, NY: Oxford University Press.

Henn, M., Weinstein, M., & Foard, N. (2009). *A critical introduction to social research*. Los Angeles: SAGE.

Henry, Robert, Amanda LaVallee, Nancy Van Styvendale, & Robert Alexander Innes (Eds.). (2018). Global Indigenous Health: Reconciling the Past, Engaging the Present, Animating the Future. Tucson: University of Arizona Press.

Hinterberger, A. (2012). Categorization, census, and multiculturalism: Molecular politics and the material of nation. In K. Wailoo, A. Nelson, & C. Lee (Eds.), Genetics and the unsettled past (pp. 204-224). New Brunswick NJ: Rutgers University Press.

Hodgon, C. (1982). "The Social and Political Implications of Tuberculosis Among Native Canadians." Canadian Review of Sociology, 19, 502-512.

Hoffecker, J. F., Elias, S. A., O'Rourke, D. H., Scott, G. R., & Bigelow, N. H. (2016). Beringian and the global dispersal of modern humans. Evolutionary Anthropology, 25: 64-78.

Hokowhitu, Brendan. (2016). "Monster: Post-Indigenous Studies." In Critical Indigenous Studies: Engagements in First World Locations, edited by A. Moreton-Robinson, 83–101. Tucson: University of Arizona Press.

----- (2009). Indigenous existentialism and the body. Cultural Studies Review, 15(2): 101 118.

------ (2004). Tackling Māori Masculinity: A Colonial Genealogy of Savagery and Sport. The Contemporary Pacific, 16(2), 259–284.

Holmes, Cindy, Sarah Hunt, and Amy Piedalue. (2014). "Violence, Colonialism, and Space: Towards a Decolonizing Dialogue." ACME, 14(2), 539-570.

Hooks, b. (1992). Black looks: Race and representation. Boston, MA: South End Press.

Hong, W. (2008). Domination in a scientific field: Capital struggle in a Chinese isotope lab. Social Studies of Science, 38(4): 543–570.

Horsman, R. (1986). Race and manifest destiny: The origins of american racial anglo-saxonism. Cambridge: Harvard University Press.

Huffine, Edwin, Crews, J., Kennedy, B., Bomberger, K., and Zinbo, A. (2001). Croatian Medical Journal, 42(3), 271-275.

Huhndorf, S. M., & Suzack, C. (2010). Indigenous feminism: Theorizing the issues. In C. Suzack, S. M. Huhndorf , J. Perreault, & J. Barman (Eds.), Indigenous women and feminism: Politics, activism, culture (pp. 1-18). Vancouver, BC: University of British Columbia Press.

Hunt, Sarah. (2015/2016). "Representing Colonial Violence: Trafficking, Sex Work, and the Violence of Law." Atlantis, 37.2 (1), 25-39.

----- (August 20, 2014). "Tina Fontaine's Death Shows How Little is Being Done For Indigenous Women." The Globe and Mail. Accessed at http://www.theglobeandmail.com/opinion/tina-fontaines-death-shows-how-littleisbeing done-for-indigenous-women/article20138787/

Huseman, J. (2012). 'A slow industrial genocide': Tar sands and the Indigenous peoples of Northern Alberta. The International Journal of Human Rights, 16(1): 216-237.

Indian Act. R.S.C. 1876, c.18. (39 Vict.).

Indigenous Science, Technology, and Society (Indigenous STS). (2016-2019). Home [webpage]. Retrieved from http://indigenoussts.com

Indigenous STS Research and Training Network. (2018). Strategic priorities of "The Indigenous Science, Technology, and Society: Toward sovereign bodies &sustainable relations" symposium. Retrieved from http://indigenoussts.com/reportof-indigenous sts-symposium-2018/

Innes, R. A. (2013). Elder Brother and the Law of the People: Contemporary kinship and Cowessess First Nation. Winnipeg, MB: University of Manitoba Press.

Institute on Governance (IOG). March 2019. "Indigenous Knowledge and ScienceKnowledge: a roundtable report." Ottawa, ON.: Institute on Governance and the Office of the Chief Science Advisor of Canada.

INTERPOL. (2018). Forensics. Retrieved from https://www.interpol.int/INTERPOL expertise/Forensics/DNA

Jabloner, Anna. (September 28, 2018). “A Tale of Two Molecular Californias.” Science as Culture, DOI: 10.1080/09505431.2018.1524863

Jacob, M. M. (2014). *Yakama rising indigenous cultural revitalization, activism, and healing*. Tucson, AZ: Univ. of Arizona Press.

Jaimes Guerrero, M. A. (2009). “‘Patriarchal Colonialism’ and Indigenism: Implications for Native Feminist Spirituality and Native Womanism.” Hypatia, 18(2), 58-69.

Jamieson, Kathleen. (1978). Indian Women and the Law in Canada: Citizens Minus. Ottawa: Advisory Council on the Status of Women/Indian Rights for Indian Women.

Jobin, Shalene, Hadley Friedland, Renee Beausoleil, & Tara Kappo. (2018). “*Wahkohtowin* ᐊᖏᑯᐃᐣ: Principles, Process, and Pedagogy.” *Canadian Legal Education Annual Review*, IN PRESS.

Jobling, Mark A. and Peter Gill. (2004). “Encoded Evidence: DNA in Forensic Analysis.” Nature Reviews Genetics, 5, 739-751.

Johnston, B. (1987). Ojibway ceremonies. Toronto, ON: McClelland & Stewart.

Jonas, Hans. (1966). The phenomenon of life: Towards a philosophical biology. New York: Harper and Row.

Justice, D. (2006). Our fire survives the storm: A Cherokee literary history. Minneapolis, MN: University of Minnesota Press.

Kahn, Jonathan. (2012). “Forensic DNA and the Inertial Power of Race in American Legal Practice.” In K. Wailoo, A. Nelson, and C. Lee (Eds.), Genetics and the Unsettled Past, 114-142. New Brunswick: Rutgers University Press.

----- (2009). “Race, Genes and Justice: A Call to Reform the Presentation of Forensic DNAEvidence in Criminal Trials.” Brooklyn Law Review, 74.2(Winter), 325–375.

Kauanui, J. K. (2016). “A Structure, Not an Event”: Settler Colonialism and Enduring Indigeneity. *Lateral*, *5*(1). doi: 10.25158/l5.1.7

----- (2008). Hawaiian blood: Colonialism and the politics of sovereignty and Indigeneity. Durham, NC: Duke University Press.

Kermoal, N. J., Altamirano-Jiménez, I., & Horn-Miller, K. (2016). Living on the Land: Indigenous Women's Understanding of Place. Edmonton, AB: AU Press.

Kim, K. M. (2009). What would a Bourdieuan sociology of scientific truth look like? Social Science Information. Information sur les sciences sociales, 48(1): 57-79.

Kimmerer, R. W. (2013). Braiding Sweetgrass: Indigenous wisdom, scientific knowledge, and the teachings of plants. Minneapolis, MN: Milkweed Editions.

Kingston, L. (2015). The destruction of identity: Cultural genocide and Indigenous peoples." Journal of Human Rights, 14(1): 63-83.

Kochhar, R. K. (1992). Science in British India. I. Colonial tool. Current Science, 63(11): 689 694.

Koenig, B. A., Lee, S. S. J., & Richardson, S. S. (Eds.). (2008). Revisiting race in a genomic age. New Brunswick, NJ: Rutgers University Press.

Kohli-Laven, N. (2012). French families, paper facts: Genetics, nation, and explanation. In K. Wailoo, A. Nelson, and C. Lee (Eds.), Genetics and the unsettled past, 114142. New Brunswick, NJ: Rutgers University Press.

Kolopenuk, Jessica. (2018). ""Pop-Up" Metis and the Rise of Canada's Post-Indigenous Formation." American Anthropologist, 120(2).

----- (2017a). A new "Indian Register" for Indigenous DNA? Policy Options. Retrieved from https://policyoptions.irpp.or/magazines/september-2017/a-new-indianregister-for indigenous-dna/.

----- (2017b). "NDN DNA." In The Great Vanishing Act: Blood Quantum and the Future of Native Nations, edited by Norbert S. Hill Jr. and Kathleen Ratteree, 159–72. Golden, CO: Fulcrum Publishing.

----- (2014). "My Girl." Aboriginal Policy Studies, 3(1), 109-114.

----- (2012). Canada's Indians (sic): (Re)racializing Canadian sovereign contours through juridical constructions of Indianness in McIvor v. Canada (unpublished master's thesis). University of Alberta, Edmonton, Alberta, Canada.

Komarnisky, Sara, Paul Hackett, Sylvia Abonyi, Courtney Heffernan, & Richard Long. (2016). "'Years Ago:' Reconciliation and First Nations Narratives of Tuberculosis in the Canadian Prairie Provinces." Critical Public Health, 26(4), 381-393.

Kovach, M. (2009). Indigenous methodologies: Characteristics, conversations and contexts. Toronto, ON: University of Toronto Press.

Kowal, E., Pearson, G., Peacock, C. S., Jamieson, S. E., & Blackwell, J. M. (2012). Genetic Research and Aboriginal and Torres Strait Islander Australians. *Journal of Bioethical Inquiry*, *9*(4), 419–432. doi: 10.1007/s11673-012-9391-x

Kroker, Arthur. (2014). Exits to the Posthuman Future. Cambridge, England: Polity Press

Kulchyski, P. (2000). What is Native Studies? In R. F. Laliberte, P. Settee, J. B. Waldram, R. Innes, B. Macdougall, L. McVain, & F. L. Barron (Eds.), Expressions in Canadian Native Studies (pp.13-26). Saskatoon, SK: University Extension Press.

Kuokkanen, Rauna. (2008). "Globalization as Racialized, Sexualized Violence." International Feminist Journal of Politics, 10(2), 216-233.

Kymlicka, W. (1995). *Multicultural citizenship*. Oxford: Clarendon Press.

LaDuke, W. (2005). Recovering the sacred: The power of naming and claiming. Cambridge, MA: South End Press.

Larcombe, Linda A., Pamela H. Orr, Andrew M. Lodge, Jodie S. Brown, Iga J. Dembinski, Leisel C. Milligan… Peter W. Nickerson. (2008). "Functional Gene Polymorphisms in Canadian Aboriginal Populations with High Rates of Tuberculosis." The Journal of Infectious Diseases, 198, 1-5. doi:10.1086/592049

Latour, Bruno. (2004). "Whose Cosmos, Which Cosmopolitics?" Common Knowledge, 10(3), 450-462.

LaVallee, A. M. (2014). Converging Methods and Tools: A Metis Group Model Building Project on Tuberculosis (unpublished Ph.D. thesis). Department of Community Health and Epidemiology, University of Saskatchewan, Saskatoon.

Lawrence, B. (2004). "Real" Indians and others: Mixed-blood urban Native peoples and Indigenous nationhood. Vancouver, BC: University of British Columbia Press.

Lawrence, Bonita and Kim Anderson. (2005). "Introduction to 'Indigenous Women: The State of Our Nations." Atlantis, 29(2), 1-10.

Leeming, William. (2004). "The Early History of Medical Genetics in Canada." Social History of Medicine, 17(3), 481-500.

Leroux, Darryl. (2019). Distorted Descent: White Claims to Indigenous Identity. Winnipeg: University of Manitoba Press.

----- (2018). 'We've Been Here for 2,000 Years': White Settlers, Native American DNA and the phenomenon of Indigenization. Social Studies of Science, 00(0): 1 21.

----- (2017). 'Native American DNA' and the self-Indigenization of French descendants. Transmissions. Retrieved from http://sites.library.queensu.ca/transmissions/native-american-dna-and-the selfindigenization-of-french-descendants/

Leroux, Darryl, and Adam Gaudry. 2017. "Becoming Indigenous: The Rise of Eastern Métis in Canada." The Conversation website. https://theconversation.com/becoming-indigenous the-rise-of-eastern-metis-incanada-80794.

Lewontin, Richard C. and Daniel Hartl. (1991). "Population Genetics in Forensic DNA Typing." Science, 254 (Dec.), 1745-1750.

Lindee, S., & Ventura Santos, R. (2012). The Biological Anthropology of Living Human Populations: World Histories, National Styles, and International Networks: An Introduction to Supplement 5. *Current Anthropology, 53*(S5), S3-S16. doi:10.1086/663335

Linné, C. von (1767). *Caroli a Linne* [sic]. . . *Systema naturæ: per regna tria naturæ, secundum classes, ordonnes, genera, species, cum characterizes & differentiis.* Editio duodecimo, reformat. Holmiæ [Stockholm]: Impensis Direct. Laurentii Salvii.

LittleBear, L. (2000). Jagged worldviews colliding. In Marie Battiste (Ed.), Reclaiming Indigenous voice and vision (pp.77-85). Vancouver, BC: University of British Columbia Press.

Little, Michael A. (2012). "Human Population Biology in the Second Half of the Twentieth Century." Current Anthropology, 53(5), S126-S138.

Long, R. & A. Lau. (2016). "How R G Ferguson's Groundbreaking Studies Influenced Our Understanding of Tuberculosis Reinfection. Where to Next?" The International Journal of Tuberculosis and Lung Disease, 12(10), 1285-1287.

Lux, Maureen K. 2016. Separate Beds: A History of Indian Hospitals in Canada, 1920s-1980s. Toronto, Buffalo, London: University of Toronto Press.

----- (2001). Medicine That Walks: Disease, Medicine and Canadian Plains Native People, 1880 1940. Toronto, ON: University of Toronto Press.

----- (1998). Perfect Subjects: Race, Tuberculosis, and the Qu'Appelle BCG Vaccine Trial." CBMH/BCHM, 15, 277-95.

Lynch, Michael, Simon A. Cole, Ruth McNally and Kathleen Jordan. (2008). Truth Machine: The Contentious History of DNA Fingerprinting. Chicago: University of Chicago Press.

Maar, M. A., N. E., Lightfoot, M. E. Sutherland, R. P. Strasser, K. J. Wilson, C. M. Lindstone Jones…P. Williamson. (2011). "Thinking Outside the Box: Aboriginal People's Suggestions for Conducting Health Studies with Aboriginal Communities." Public Health, 125, 747-753.

MacDougall, B. (2006). Wahkootowin: Family and cultural identity in Northwestern Saskatchewan Metis communities. The Canadian Historical Review 87(3): 431-462.

Mack, J. (2011). Hoquotist: Reorienting through storied practice. In H. Lessard, R. Johnson, & J. Webber (Eds.), Storied communities: Narratives of contact and arrival in constituting political community (pp. 287-307). Vancouver, BC: University of British Columbia Press.

Malhi, R. S., & Bader, A. C. (2015). Engaging Native Americans in genomic research. American Anthropologist, 117(4): 743-749.

Martens, Kathleen. (2017). "Métis Nation Disputes Census Data." APTN News. http://aptnnews.ca/2017/10/25/metis-nation-disputes-census-data/.

Martin, Luther H., Huck Gutman, & Patrick H. Hutton, (Eds.). (1988). Technologies of the Self: A Seminar with Michel Foucault. Amherst: The University of Massachusetts Press.

Maud, Velvet. (2013). "Perceptions of the Metis and Tuberculosis: An Examination of Historical Works." The Canadian Journal of Native Studies, XXXIII(2), 55-70.

Mawani, R. (2010). *Colonial proximities: crossracial encounters and juridical truths in British Columbia, 1871-1921*. Vancouver, BC: UBC Press.

McCallum, M.J.L. (2017). Starvation, Experimentation, Segregation, and Trauma: Words for Reading Indigenous Health History. *The Canadian Historical Review 98*(1), 96-113.

McCallum, Mary Jane Logan & Adele Perry. (2018). Structures of Indifference: An Indigenous Life and Death in a Canadian City. Winnipeg, MB, Treaty 1 Territory: University of Manitoba Press.

McClearn, Matthew. (2017, January 5). The Monsters in Their Midst. *The Globe and Mail*. Retrieved from https://www.theglobeandmail.com/news/investigations/the monsters-in their-midst/article31290420/

McInnes, R. (2011). 2010 Presidential Address: Culture: The silent language geneticists must learn – Genetic research with Indigenous populations. The American Journal of Human Genetics, 88: 254-261.

McIvor, Sharon Donna. (2004). "Aboriginal Women Unmasked: Using Equality Litigation to Advance Women's Rights." Canadian Journal of Women & the Law, 16, 106-136.

McMillen, Christian W. (2008). "'The Red Man and the White Plague:' Rethinking Race, Tuberculosis, and American Indians, ca. 1890-1950." Bulletin of the History of Medicine, 82(3), 608-645.

Meijer Drees, L. (2013). Healing Histories: Stories from Canada's Indian Hospitals. Edmonton, AB: University of Alberta Press.

Mello, M. M., & Wolf, L. E. (2010). The Havasupai Indian Tribe case–lessons for research involving stored biologic samples. New England Journal of Medicine, 363: 204-207.

Million, Dian. (2009). Felt Theory: An Indigenous Feminist Approach to Affect and History. Wicazo Sa Review, 24(2): 53-76.

Moffatt, J., M. Mayan, and R. Long. (2013). "Sanatoriums and the Canadian Colonial Legacy: The Untold Experiences of Tuberculosis Treatment." Qualitative Health Research, 23, 191-199.

Moffatt, Jessica, Richard Long, & Maria Mayan. (2013). "Taking Care of Our Own: The Multifaceted Relationship Between On-Reserve Housing and Tuberculosis Occurrence." Pimatisiwin: A Journal of Aboriginal and Indigenous Community Health, 11(3), 555 564.

Kahnawa: ke Mohawk Council. (July 13, 2016). "MCK Send Letter to Indigenous Affairs Denouncing Mikinak of Beauharnois & Confederation of Aboriginal People of Canada." Accessed from http://www.kahnawake.com/pr_text.asp?ID=3194

Møller, H. (2010). "Tuberculosis and Colonailism: Current Tales About Tuberculosis and Colonialism in Nunavut." Journal of Aboriginal Health, 6, 38-48.

Moreau, Claudia, Jean-Francois Lefebvre , Michele Jomphe, Claude Bherer, Andres Ruiz Linares, Helene Vezina, Marie-Helene Roy-Gagnon, and Damian Labuda. 2013. "Native American Admixture in the Quebec Founder Population." PloS ONE 8(6): e65507.

Moreton-Robinson, A. (2016). Introduction: Locations of engagement in the First World. In A. Moreton-Robinson (Ed.), Critical Indigenous Studies: Engagements in First World Engagements (pp. 3-16). Tucson: University of Arizona Press.

----- (2015). The White Possessive: Property, power, and Indigenous sovereignty. Minneapolis, MN: University of Minnesota Press.

----- (2004). The possessive logic of patriarchal White sovereignty: The High Court and the Yorta Yorta decision. Borderlands e-journal, 3(2).

----- (2001). A possessive investment in patriarchal whiteness: Nullifying Native Title. In P. Nursey-Bray, C. L. Bacchi (Eds.), Left Directions: Is There a Third Way? (pp. 162 177). Crawley, Australia: University of Western Australia Press.

----- (2000). Talkin' Up to the White Woman. St Lucia, AU: University of Queensland Press.

Morton Ninomiya, Melody E. & Nathaniel J. Pollock. (2017). "Reconciling Community Based Indigenous Research and Academic Practices: Knowing Principles is Not Always Enough." Social Science & Medicine, 172, 28-36.

Morgensen, S. L. (2011). The biopolitics of settler colonialism: Right here, right now. Settler Colonial Studies, 1: 52-76.

Morton, Samuel George. (1839). Crania Americana: Or, a Comparative View of the Skulls of Various Aboriginal Nations of North and South America, To Which is Prefaced an Essay on the Varieties of the Human Species. Philadelphia: J. Dobson.

Mosby, I. (2013). Administering colonial science: Nutrition research and human biomedical experimentation in Aboriginal communities and residential schools, 1942–1952. Histoire Sociale/Social History, 46(1): 145.

Moses, J. W., & Knutsen, T. L. (2019) (original . *Ways of knowing: competing methodologies in social and political research*. London: Red Globe Press.

Munsterhjelm, Mark. (2014). Living Dead in the Pacific: Racism and Sovereignty in Genetics Research on Taiwan Aborigines. Vancouver and Toronto: UBC Press.

Nadasdy, Paul. (2005). "The Anti-politics of TEK: The Institutionalization of Comanagement Discourse and Practice." Anthropologica, 47, 215-232.

Nakamura, L., & Chow-White, P. (Eds.). (2012). Race after the internet. New York, NY: Routledge.

Napoleon, V. (2001). Extinction by number: Colonialism made easy. Canadian Journal of Law and Society, 16(1): 113-45.

Naylor, C. D. (2017). Canada's fundamental science review, final report. Retrieved from http://www.sciencereview.ca/eic/site/059.nsf/eng/home

National DNA Databank of Canada. (2016). "The National DNA Databank of Canada Annual Report 2015-2016." Accessed at http://www.rcmp-grc.gc.ca/en/the national-dna-data bank-canada-annual-report-2015-2016

National Inquiry. (2019). Reclaiming power and place: The final report of the national inquiry into missing and murdered Indigenous women and girls.

Nelson, A. (2016). *Social life of DNA*. Boston, MA: Beacon Press.

----- (2012). “Reconciliation Projects: From Kinship to Justice.” In K. Wailoo, A. Nelson, and C. Lee (Eds.), Genetics and the Unsettled Past, 114-142. New Brunswick: Rutgers University Press.

Nichols, R. (2017). Theft Is Property! The Recursive Logic of Dispossession. *Political Theory*, *46*(1), 3–28. doi: 10.1177/0090591717701709

----- (2014). “The Colonialism of Incarceration.” Radical Philosophy Review, 17(2), 435-455.

Noel, Brigitte. (2016, August 22). “This Unrecognized Aboriginal Community is Pissing Off Quebec Mohawks Indigenous Leaders say the Mikinaks are Maing a Mockery of Their Struggle.” Vice. Accessed from https://www.vice.com/en_ca/article/xdmpaq/this unrecognized-aboriginal-community-is-pissing-off-quebec-mohawks

NWAC. (2017). Understanding MMIWG. Retrieved from https://www.nwac.ca/national inquiry-mmiwg/understanding-mmiwg/

-----. (2014, December 17). NWAC Continues to call for a National Public Inquiry and a Comprehensive Plan of Action to Address Violence Against Aboriginal Women and Girls. Retrieved from https://www.nwac.ca/2014/09/nwacs-responsetogovernment ofcanada-action-plan/

-----. (2009). Voices of Our Sisters in Spirit: A Reportto Families and Communities, 2nd ed. Canada. Accessed fromhttps://www.nwac.ca/wp content/uploads/2015/05/NWAC_Voices-of-OurSisters-In-Spirit_2nd Edition_March-2009.pdf

Oppal, Wally T. (2012). Forsaken: The Report of the Missing Women Commission of Inquiry Executive Summary. British Columbia.

Orlando, L., Gilbert, M. T. P., & Willerslev, E. (2015). Reconstructing ancient genomes and epigenomes. *Nature Reviews: Genetics, 16:* 395-408.

Palmater, P. D. (2011). Beyond blood: Rethinking Indigenous identity. Saskatoon, SK: Purich Publishing Limited.

Peterson, Jacqueline and Jennifer Brown. (1985). The New Peoples: Being and BecomingMetis in North America. Winnipeg: University of Manitoba Press.

Petit, Charles. February 19, 1998. “Trying to Study Tribes While Respecting Their Cultures / Hopi Indian geneticist can see both sides.” San Francisco Chronicle accessed from https://www.sfgate.com/news/article/Trying-to-StudyTribesWhile Respecting-Their-3012825.php

Piquemal, N. (2001). “Free and Informed Consent in Research Involving Native American Communities.” American Indian Culture and Research Journal, 25, 65-79.

Public Safety Canada. 2018, March 12. Government of Canada Announces Launch of the RCMP's National Missing Persons DNA Program. Retrieved from https://www.canada.ca/en/public-safety-canada/news/2018/03/government-of canada-announces-launch-of-the-rcmps-national-missing-persons-dnaprogram.html

Quigley, D. (2006). "Perspective: A Review of Improved Ethical Practices in Environmental and Public Health Research: Case Examples from Native Communities." Health Education & Behaviour, 33, 130-147.

Rabson, Mia. (2014, August 28). Justice Minister Rejects Inquiry as Premiers Agree to Roundtable. Winnipeg Free Press. Retrieved from https://www.winnipegfreepress.com/local/yet-another-study-not-needed 272988601.html

Radin, J., & Kowal, E. (Eds.). (2017). Cryopolitics: Frozen Life in a Melting World. Cambridge, MA: The MIT Press.

Razack, Sherene. (2000). "Gendered Racial Violence and Spatialized Justice: The Murder of Pamela George." Canadian Journal of Law & Society, 15(2), 91-130.

RCAP. (1996). Bridging the Cultural Divide: A Report on Aboriginal People and Criminal Justice in Canada. Ottawa: Royal Commission on Aboriginal Peoples.

RCMP. (2016). The National DNA Data Bank of Canada Annual Report 2015-2016. Retrieved from http://www.rcmp-grc.gc.ca/en/the-national-dna-data-bank-canada annual report-2015-2016

----- (2014). Missing and Murdered Aboriginal Women: A National Operational Overview. Retrieved from http://www.rcmp-grc.gc.ca/en/missing-and-murderedaboriginal women-national-operational-overview#sec3

----- (2007). National DNA Data Bank: Privacy and Security. Retrieved from http://www.rcmp-grc.gc.ca/nddb-bndg/privacy-privee-eng.htm

----- (2003, July 16). National DNA Data Bank: Technology. Retrieved from http://www.rcmp-grc.gc.ca/nddb-bndg/techno-eng.htm

Reardon, J. (2017). *The postgenomic condition ethics, justice, and knowledge after the genome*. Chicago: The University of Chicago Press.

----- (2005). Race to The Finish: Identity and Governance in An Age of Genomics. Princeton, NJ: Princeton University Press.

Reardon, Jenny, and Kim TallBear. 2012. "'Your DNA is Our History': Genomics, Anthropology, and the Construction of Whiteness as Property." Current Anthropology 53 (S5), S233–45.

Relethford, John H. and Deborah Bolnick. 2018. "Ancestry, Identity, and Race." In Reflections of Our Past: How Human History is Revealed in Our Genes, 2nd Edition, edited by John H. Relethford and Deborah Bolnick, 207-234. New York and London: Routledge Taylorand Francis Group.

Ries, Nola M., and Edna Einsiedel. 2010. "Online Direct-to-Consumer Genetic Testing: Issues & Policy Options." Policy Brief No. 3. Ottawa, ON: Genome Canada.

Rifkin, M. (2014). Making peoples into populations: The racial limits of Tribal sovereignty. In A. Simpson, & A. Smith (Eds.), Theorizing Native Studies. Durham, NC: Duke University Press

Risch, N., Esteban Burchard, Elad Ziv, & Hua Tang. (2002). "Categorization of Humans in Biomedical Research:Genes, Race and Disease. Genome Biology, 3(7),1-12.

Roberts, Hal. (2014, October 27). New $8.1M DNA Program Will Help Police Crack Missing Persons Cases. Toronto Sun. Retrieve from http://torontosun.com/2014/10/27/new-81m-dna-program-will-help-police-crack missing-persons-cases/wcm/ec0da667-ee8a-4555-bacd-b4f5e7c94be0

Roy, P. E. (1989). A white man's province: British Columbia politicians and Chinese and Japanese immigrants, 1858-1914. Vancouver, BC: University of British ColumbiaPress.

Ruttan, L. (2004). "Exploring Ethical Principles in the Context of Research Relationships." Pimatisiwin: A Journal of Aboriginal and Indigenous Community Health, 2(1), 11-28.

Sahota, P. C. 2014. "Body Fragmentation: Native American Community Members' Views on Specimen Disposition in Biomedical/genetics Research." AJOB Empir.Bioeth. 5, 19-30.

Said, E. (1993). Culture and imperialism. New York, NY: Knopf.

----- (1978). Orientalism. New York, NY: Random House.

Saldanha, A. (2006). Reontologising race: The machinic geography of phenotype. Environment and Planning D: Society and Space, 24: 9-24.

Sarewitz, D. (2016). Saving Science. New Atlantis: A Journal of Technology & Society, 49, 540.

Saskatchewan Provincial Partnership Committee on Missing Persons. (October 2007). Final Report of the Provincial Partnership Committee on Missing Persons. Retrieved from http://publications.gov.sk.ca/documents/9/86177Final%20Report%20on%20PPMP%202007.pdf

Schiebinger, L. (Ed.). (2005). Colonial science [Special issue]. Isis, 96: 52–87.

----- (2004). Plants and empire: Colonial bioprospecting in the Atlantic World. Cambridge, MA: Harvard University Press.

Schnarch, B. (2004). "Ownership, Control, Access, and Possession (OCAP) or Self determination Applied to Research: A Critical Analysis of Contemporary First Nations Research and some Options for First Nations Communities." Journal of Aboriginal Health, 1, 80-94.

Senate Canada. (2010). "Public Protection, Privacy and the Search for Balance: A Statutory Review of the DNA Identification Act." Standing Senate Committee on Legal and Constitutional Affairs. The Honourable Joan Fraser (Chair) and the Honourable John D. Wallace (Deputy Chair). 40th Parliament, 3rd Session.

Seth, Suman. (2009). "Putting Knowledge in its Place: Science, Colonialism, and the Postcolonial." Postcolonial Studies, 12(4), 373-388.

Shiyu Luo, C. Alexander Valencia, Jinglan Zhang, Ni-Chung Lee, Jesse Slone, Baoheng Gui, Xinjian Wang, Zhuo Li, Sarah Dell, Jenice Brown, Stella Maris Chen, Yin Hsiu Chien, Wuh-Liang Hwu, Pi-Chuan Fan, Lee-Jun Wong, Paldeep S. Atwal, and Taosheng Huang. 2018. "Biparental Inheritance of Mitochondrial DNA in Humans." PNAS 115 (51), 13039-13044.

Simes, A. B. and L. E. Paynter. (1934). "A study of the occurrence of virulent tubercle bacilli in the excreta of tuberculous Indian children." Tubercle, 498-503.

Simpson, Audra. (2014). Mohawk Interruptus: Political Life Across the Borders of SettlerStates. Durham and London: Duke University Press.

----- (2008). Subjects of Sovereignty: Indigeneity, The Revenue Rule, and Juridics of Failed Consent." Law and Contemporary Problems, 71, 191-216.

----- (2000). Paths toward a Mohawk Nation: Narratives of citizenship and nationhood in Kahnawake. In D. Ivison, P. Patton, & W. Sanders (Eds.), Political Theory and the Rights of Indigenous Peoples. Cambridge, United Kingdom: Cambridge University Press.

Simpson, L. (2011). Dancing on our Turtle's Back. Winnipeg, MB: Arbeiter Ring Press.

------ (2008). Looking after Gdoo-Naaganinaa: Precolonial Nishnaabeg diplomatic and Treaty relationships. Wicazo Sa Review, 23(2): 29-42.

------ Simpson, L. (2004). Anticolonial strategies for the recovery and maintenance of Indigenous knowledge. American Indian Quarterly, 28: 373-384.

Smart, C. (1989). Feminism and the power of law. London, United Kingdom: Routledge.

Smedley A., & Smedley B. (2012). Race in North America: Origin and evolution of a worldview (4th ed.). Boulder, CO: Westview Press.

Smith, L. T. (1999). Decolonizing Methodologies: Research and Indigenous Peoples. London and New York: Zed Books; Dunedin: Otago Press.

Snelgrove, C., Dhamoon, R., & Corntassel, J. (2014). Unsettling settler colonialism: The discourse and politics of settlers, and solidarity with Indigenous Nations. Decolonization: Indigeneity, Education & Society, 3(2): 1-32.

Sozer, Amanda C. (2014). DNA Analysis for Missing Person Identification in Mass Fatalities. Boca Raton: Taylor and Francis Group, CRC Press.

Statistics Canada. (2017). Aboriginal Peoples in Canada: Key Results from the 2016 Census. http://www.statcan.gc.ca/dailyquotidien/171025/dq171025a-eng.htm.

Stepan, N. (1982). The idea of race in science: Great Britain, 1800–1960. London, United Kingdom: Macmillan.

Stewart, D. A. (1939, March 3). T.B. among Indians. The Winnipeg Free Press, p. 12.

Stoler, A. L. (2009). Along the archival grain: Epistemic anxieties and colonial common sense. Princeton, NJ: Princeton University Press.

----- (1995). *Race and the education of desire: Foucaults History of sexuality and the colonial order of things*. Durham: Duke University Press.

St-Onge, Nicole. 2008. “Memories of Metis Women of Saint-Eustache, Manitoba- 1920-1980.” Native Studies Review 17(2), 45-68.

Stote, Karen. (2015). An Act of Genocide: Colonialism and the Sterilization of Aboriginal Women. Halifax and Winnipeg: Fernwood Publishing.

Sturm, C. (2002). Blood politics: Race, culture, and identity in the Cherokee Nation of Oklahoma. Los Angeles, CA: University of California Press.

Subramaniam, B. (2014). Ghost stories for Darwin: The science of variation and the politics of diversity. Champagne, IL: University of Illinois Press

Sullivan S. (2013). Inheriting racist disparities in health: Epigenetics and the transgenerational effects of White racism." Critical Philosophy of Race, 1: 190-218.

Sunder Rajan, Kaushik and Sabina Leonelli. (2013). "Introduction: Biomedical Trans Actions, Postgenomics, and Knowledge/Value." Public Culture, 25(3 (71)), 463-475.

TallBear, Kim. (2014). Standing with and speaking as faith: A feminist-Indigenous approach to inquiry [Research Note]. Journal of Research Practice, 10(2): 1-7.

----- (2013). Native American DNA: Tribal belonging and the false promise of genetic science. Minneapolis, MN: University of Minnesota Press.

----- (2003). "DNA, Blood, and Racializing the Tribe." Wicazo Sa Review 18(1): 81-107.

Taniguchi, N. K., Taualii, M., & Maddock, J. (2012). A comparative analysis of Indigenous research guidelines to inform genomic research in Indigenous communities. The International Indigenous Policy Journal, 3(1): 1-20.

Tequila Sovereign: The Indigenous Feminist Killjoy. (2011). Search results for settler colonialism [video transcript]. Retrieved from https://tequilasovereign.wordpress.com/?s=settler+colonial&submit=Search

Thomas, Wesley and Sue-Ellen Jacobs. (1999). "' … And We Are Still Here': From Berdache to Two-Spirit People." American Indian Culture and Research Journal, 23(2), 91-107.

Thompson, Debra. (2008). Nation and Miscegenation: Comparing Anti-Miscegenation Regulations in North America. Conference paper for the Canadian Political Science Association 80th Annual Conference, June 4-6, 2008.

Trask, Haunani-Kay. (1999). From a Native Daughter: Colonialism and Sovereignty in Hawai'i. Honolulu: University of Hawai'i Press.

Truth and Reconciliation Commission Canada. (2015). Honouring the Truth, Reconciling for The Future: Summary of The Final Report of the Truth and Reconciliation Commission of Canada. Winnipeg: Truth and Reconciliation Commission of Canada.

Tsosie, Rebecca A. (2007). Cultural challenges to biotechnology: Native American genetic resources and the concept of cultural harm. *Journal of Law, Medicine & Ethics*, 35: 396 411.

Tuck, E., & McKenzie, M. (2015). Place in research: Theory, methodology, and methods. New York, NY: Routledge.

Tuck E., & Yang, W. (2012). Decolonization is not a metaphor. Decolonization: Indigeneity, Education & Society, 1(1): 1-40.

Tully, J. (1995). Strange multiplicity: Constitutionalism in an age of diversity. Cambridge, United Kingdom: Cambridge University Press.

Uchida, A. and M. Ray. (1966). "Mail-order chromosome analysis." *CMAJ*, 94(13): 649-650.

Voth, Daniel. (Forthcoming). The Race Question in Canada and the Politics of Racial Mixing (unpublished manuscript).

Wade, P., Beltran, C. L., Restrepo, E., & Santos, R. V. (2014). Mestizo genomics: Race mixture, nation, and science in Latin America. Durham, NC: Duke University Press.

Walker, Barrington. (2000). "The Tale of Ida Jane and George: Murder, Miscegenation, and Bastardy in 1893 Raleigh, Ontario." Canadian Review of American Studies, 30(2): 211-227.

Walker, James. (1997). 'Race,' Rights, and the Supreme Court of Canada: Historical Case Studies. Waterloo, ON: Wilfred Laurier University Press.

Wallerstein, I. M. (1976). The modern world-system: Capitalist agriculture and the origins of the European world-economy in the sixteenth century. New York, NY:Academic Press.

Walter, M., & Andersen, C. (2013). Indigenous statistics: A quantitative research methodology. Walnut Creek, CA: Left Coast Press.

Warner, H. J. (1932). "The Incidence of Tuberculosis Infection Among School-Children on Five Montana Indian Reservations." Am. Rev. Tuberc., 26, 507-515.

Washburn, Sherwood L. (1951). "The New Physical Anthropology." Transactions of the New York Academy of Science 13, 298-304.

Weber-Pillwax, Cora. (2001). "Coming to an understanding: A panel presentation what is Indigenous research?" *Canadian Journal of Native Education*, 25(2), 166-174.

Welsh, Christine. (2006). Finding Dawn. National Film Board of Canada.

West, K. M., E. Blacksher, & W. Burke. (2017). "Genomics, Health Disparities, and Missed Opportunities for the Nation's Research Agenda." JAMA, 317, 1831-1832.

Whitt, L. A. (1997). "Resisting Value-bifurcation: Indigenist Critiques of the Human Genome Diversity Project." In A. Ferguson & B. A. Bar On (Eds.), Daring to be Good: Feminist Essays in Ethico-politics (70-84).

Williams, E. E. (1994). Capitalism & slavery. Chapel Hill, NC: University of North Carolina Press.

Wilmer, F. (1998). The Indigenous Voice in World Politics. Newbury Park: Sage Publications.

Wilson, Daniel. (1869). "Race Head-forms and Their Expression by Measurement." Canadian Journal of Science, Literature, and History, 12(70): 269-303.

Wilson, S. (2009). Research is ceremony: Indigenous research methods. Black Point, NS: Fernwood Publishing Co., Ltd.

Wiwchar, D. (2000, September 21). Genetic researcher Uses Nuu-chah-nulth Blood for Unapproved Studies in Genetic Anthropology [online article]. Ha-Shilth-Sa. Retrieved from http://www.hashilthsa.com/archive/news/2013-0722/geneticresearcher uses nuu-chah-nulth-blood-unapproved-studies-genetic-anth

Wolfe, P. (2006). Settler colonialism and the elimination of the Native. Journal of Genocide Research, 8(4): 387-409.

Wolin, S. S. (2004). Politics and vision: Continuity and innovation in Western political thought. Princeton, NJ: Princeton University Press.

Woolford, A. (2013). Nodal repair and networks of destruction: Residential schools, colonial genocide, and redress in Canada. Settler Colonial Studies, 3(1): 65-81.

World Health Organization. (2018). Research for TB Elimination. Retrieved from https://www.who.int/tb/areas-of-work/research/en/

Young, Alannah Earl and Denise Nadeau. (2005). "Decolonising the Body: Restoring Sacred Vitality." Atlantis 29(2), 1-13.

Young, R. J. C. (1995). *Colonial desire: Hybridity in theory, culture and race*. London: Routledge.